3.3.2 Number of research papers per teachers in the Journals notified on UGC website during the year

INDEX

S.No.	Description	Page No.
1.	Certificate of the head of the institution	2
2.	Supporting documents	3

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TO WHOMSOEVER IT MAY CONCERN

This is to certify that Number of research papers per teachers in the Journals notified on UGC website during the year are as follows

Academic Year	2016-17	2017-18	2018-19	2019-20	2020-21
Number of publications	05	15	29	43	87

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Aditya Nagar, ADB Road, Surampalem

List of National/ International Journal Publication – During Last 5 years

S No	Title of paper	Name of the author/s	Department of the teacher	Name of journal	Year of publication	ISSN number	Page No
1	Effect of Heat Treatment on the Corrosion Behaviour of Nickel Surface-Deposited Agro-Reinforced Metal Matrix Composites	Nitla Stanley Ebenezer B Vinod, Hanumanthu Satya Jagadesh	MECH	Journal of The Institution of Engineers (India): Series D	2020-21	2250-2130	27
2	Certain classes of analytic functions connected with Q analogue of the Bessel function	Nazek Alessa, B.Venkateswarlu, K.LoganthanT S.Karthik,	ECE	Journal of Mathematics	2020-21	2314-4629	28
3	A decisive evaluation of series connected-hybrid modulated inverter for EV applications	B.Rajani, B.Naidu K	EEE	Materials Today:Proceedings	2020-21	2196-2206	29
4	Covid Disease Detection Using Relu Variants	R. V. S. Lalitha, D. Haritha, challapalli sujana and j. Divya lalitha	CSE	Advances and Applications in Mathematical Sciences	2020-21	0974-6803	30
5	Synthesis, Micro-structural and vibrational studies of Nb doped Lithium Titanate Anode Materials for Lithium-ion Batteries	D.Vijaya Lakshmi, K.Anjani Devi, B.Vikram, M.K.Raju, M.Sushma Reddi, A.Rama Krishna, K.Samatha, P.V.Lakshmi Narayana	H&BS	Solid state technology	2020-21	0038-111X	31
6	Magnetic and DC Electrical Resistivity Properties of Cu doped Mg0.6-xNi0.4CuxFe2O4 Ferrite	S. Kuswanth Kumar, N. Murali, D. Parajuli, A. Ramakrishna, P. S. V. Subba Rao, M. P. Rao	H&BS	Solid state technology	2020-21	0038-111X	32
7	Orthogonal stability and Nonstability of a Generalized Quartic Functional Equation in Quasi b-Normed Spaces	Nazek Alessa, K. Tamilvanan, K. Loganathan, Karthik, T.S, and John	ECE	Journal of Function Spaces	2020-21	2314-8896	33

ADITYA COLLEGE OF ENGINEERING & TECHNOLOGY SURAMPALEM

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SURAMPALEM- 533 437

-		Michael Rassias					
8	Building time series prognostic models to analyze the spread of COVID-19 pandemic	Ch.V.Raghavendran, G.Naga Satish, Rama Reddy T, B.Annaparna	IT	International Journal of Advanced Science and Technology	2020-21	2207-6360	34
9	Effect of Cr3+ substitution on dc electrical resistivity and magnetic properties of $CuFe_{0.7}Co_{0.3}Fe_{2-x}Cr_xO_4$ ferrite nanoparticles prepared by sol-gel auto combustion method	V.Raghavendra,Chandramouli, K. ; Suryanarayana B. ; Phanidhar Varma P. V. S. K. ; Emmanuel K. A. ; Taddesse Paulos ; Murali N. ; Wegayehu Mammo Tulu ; Parajuli, D.	H&BS	Results in Physics	2020-21	2211-3797	35
10 -	Effect of Cu substitution on magnetic and DC electrical resistivity properties of Ni-Zn nano ferrites	V.Raghavendra,K. Chandramouli , P. Anantha Rao, B. Suryanarayana , D. Parajuli, Paulos Taddesse, Tulu Wegayehu Mammo, M. K. Raju , Dr. Murali Nandigam	H&BS	Journal in Material Science	2020-21	2190-3018	36
11	Fashion compatibility using convolutional neural networks	K. Kavitha, S. Laxman Kumar, Pudu Pravalika, Kotte Sruthi, R.V.S. Lalitha, N.V. Krishna Rao	CSE	Materials Today:Proceedings	2020-21	2214-7853	37
12	An overview about influence of wick materials on heat and mass transfer in solar desalination systems	M.Murugan, A.Saravanan, Pramod Kumar, V.Siva Nagi Reddy, Abdul Ariff	MECH	IOP SCIENCE	2020-21	1757-899X	38

ADITYA COLLEGE OF ENGINEERING & TECHNOLOGY SURAMPALEM

PRINCIPAL
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SURAMPALEM- 533 437

13	A comparative study on crack-heating ability of Al2O3/SiC Structural ceramic composites synthesized by microwave sintering and conventional electrical sintering	Madhan Mohan Kumar, A.N.Shankar, T.S.Karthik, R Saravana Kumar, O.Hemakesavulu, S.Venkatesa Prabhu, N.Rakesh	ECE	Advances in Materials Science and Engineering	2020-21	1687-8434	39
14	Investigation on dielectric properties of press board coated with epoxy resin quart and rice husk ash	S.Bhanumathi, T.S.Karthik, M.Sasirekha, Kiran Rama Swamy, J.Vishnu, M.K.Yuvan, R.R.Kavin, S.Sathish Kumar	ECE	Advances in Materials Science and Engineering	2020-21	1687-8434	40
15	MHD Flow of Thermally radiative maxwell fluid past a heated stretching sheet with Cattaneo-Christov dual diffusion	K.Loganathan, Nazek Alessa, Ngawang Namgyel, T.S.Karthik	ECE	Journal of Mathematics	2020-21	2314-4785	41
16	Corrosion behaviour of Bamboo leaf ash-reinforced Nickel surface-deposited Aluminium metal matrix composites	N.Stanley Ebenzer, B.Vinod, Hanumanthu Satya Jagadish	MECH	Journal of Bio- and Tribo-Corrosion	2020-21	2198-4239	42
17	Synthesis, Structural and antibacterial activity of pure Fe doped and glucose capped ZnO nano particles	K.Chandra Mouli, B.Suryanarayana, T.Anil Babu, V.Raghavendra, D.Parajuli, N.Murali, M.Venkaiah, T.Wegayehu Mammo, P.S.V.Shanmukhi	HBS	Surfaces and Interfaces	2020-21	2468-0230	43
18	Charge transport through functionalized graphene quantum dots embedded in a polyaniline matrix	Abu Bakar Siddique, Kelly Morrison, Guru Venkat, Ashit kumar Pramanick, Niladri Banerjee	ECE	ACS Applied Electronic Materials	2020-21	2637-6113	44

ADITYA COLLEGE OF ENGINEERING & TECHNOLOGY SURAMPALEM

PRINCIPAL
Aditya College of
Engineering & Technology
SURAMPALEM- 533 437

19	Influence of Cr3+ substituted Co0.7Cu0.3Fe2-xCrxO4 nanoferrite on structural, morphological, dc electrical resistivity and magnetic properties	K.Chandra Mouli, V.Raghavendra, P.V.S.K.Phanidhar Varma, B.Suryanarayana, T.Wegayehu Mammo, D.Parajuli, Paulos T, N.Murali	HBS	Applied Physics A Materials Science & Processing	2020-21	1432-0630	45
20	Evaluation of micro-structural and magnetic properties of nickel nano-ferrite and Mn2+ substituted nickel nano-ferrite	J.Suresh, B.Trinadh, B.Vikram Babu, P.V.S.S.S.N.Reddy, B.Sathish Mohan, A.Rama Krishna, K.Samatha	H&BS	Physica B: Condensed Matter	2020-21	0921-4526	46
21	Effect of welding current in TIG welding 304L steel on temperature distribution, microstructure and mechanical properties	Pramod Kumar, Amar Nath Sinha, Chetan Kumar Hirwani, M.Murugan, A.Saravanan, Akhilesh Kumar Singh	MECH	Journal of the Brazilian Society of Mechanical Sciences and Engineering	2020-21	1806-3691	47
22	Micro-structural, dielectrical and magnetic properties of Cu2+ substituted Ni0.7Mn0.3-xCuxFe2O4(x=0.0,0.05,0.1,0.15 and 0.2) nano-ferrites	J.Suresh, B.Trinadh, B.Vikram Babu, P.V.S.S.S.N.Reddy, A.Rama Krishna, B.Sathish Mohan, Ramu Yarra, K.Samatha	H&BS	Journal of Magnetism and Magnetic Materials	2020-21	0304-8853	48
23	Study of microstructure and mechanical properties of NiTi wire cladding on super austenitic stainless steel 904 L by TIG cladding process	Pramod Kumar, Amar Nath Sinha, A.Saravanan, M.Murugan, Chetan Kumar Hirwani	MECH	Sadhana	2020-21	0973-7677	49
24	Investigation of TIG cladding of NiTi wire on substrate 304L to study the effect of applied current on microstructure and mechanical properties	Pramod Kumar, Amar Nath Sinha, Chetan Kumar Hirwani,Akhilesh Kumar Singh,	MECH	Transactions of the Indian Institute of Metals	2020-21	0975-1645	50

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PRINCIPAL
Aditya College of
Engineering & Technology
SURAMPALEM- 533 437

		P.Piyush Kumar, M.Murugan, A.Saravanan					
25	Mathematical transmission analysis of SEIR tuberculosis disease model	B.S.N.Murthy, Sk.Abdus Samad, Md.Haider Ali Biswas	HBS	Sensors International	2020-21	2666-3511	51
26	A hybrid optimization based energy management between electric vehicle and electricity distribution system	B.Rajani, D.Chandra Sekhar	EEE	International Transactions on Electrical Energy Systems	2020-21	2050-7038	52
27	study of welding process parameter in tig joining of aluminium alloy (6061)	Pramod kumar, Abdul Arif, A Chiranjeevi V S Prasad, Puli Danaiah, Akhilesh Kumar Singh,M Murugan	MECH	Materials Today:Proceedings	2020-21	2214-7853	53
28	free vibration analysis of an orthotropic plate by dynamic stiffness method and wittrick williams algorithm	Suraj Yadav, Pramod Kumar	MECH	Materials Today: Proceedings	2020-21	2214-7853	54
29	Use of backing mediums increase penetration during TIG welding of P91 steel	Akhilesh Kumar Singh, Vidyut Dey, Pramod Kumar	MECH	Sadhana	2020-21	0973-7677	55
30	Wide dual bond aymmetrical I shape rectangular microstrip patch antenna for PCS/UMTS/WiMAX/IMT application	Ramesh Kumar Verma, D.K.Srivastava, T.Ravi Pratap, Vivek Rajpoot	ECE	Wireless Personal Communications	2020-21	1572-834X	56
31	Hybrid common control channel based MAC protocol with proactive handoff scheme in cognitive radio network	Vivek Rajpoot, T.Vijay Shanker	ECE	Wireless Personal Communications	2020-21	1572-834X	57
32	Filtering antennas: A technical review	G.Ajay Kumar, Muhammad Shah Alam, Vivek Rajpoot	ECE	International Journal of RF and microwave computer aided engineering	2020-21	1099-047X	58
33	Seismic fragility and life cycle cost analysis of reinforced concrete structures with a hybrid damper	Ch.Naga Deeraj Kumar Reddy, L.Natrayan, Wubishet	CIVIL	Advnces in Civil Engineering	2020-21	1687-8094	59

ADITYA COLLEGE OF ENGINEERING & TECHNOLOGY SURAMPALEM

PRINCIPAL
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SURAMPALEM- 533 437

		Degife Mammo					
34	A review on recent developments of solar stills to enhance productivity using nanoparticles and nano-PCM	Nagaraju.V, Murali.G, Sankeerthana. M, M.Murugan	MECH	International Journal of Green Energy (Taylor & Francis)	2020-21	1543-5075	60
35	Excitation dependence and independence of photoluminescence in carbon dots and graphene quantum dots: Insights into the mechanism of emission	Mallar Ray,Syed Minhaz Hossain,Ashit Kumar Pramanick,Ab u Bakar Siddique	ECE	Royal Society of Chemistry	2020-21	2040-3372	61
36	Road extraction using Aerial images for future Navigation	A.Sravanthi Peddinti, Arjun Singh Chouhan, Asisa Kumar Panigrahy	ECE	Materials Today: Proceedings	2020-21	2214-7853	62
37	Sensitivity analysis and prediction of erodibility of treated unsaturated soil modified with nanostructured fines of quarry dust using novel artificial neural network	Kennedy C. Onyelowe, Tamminseni Gnananandarao,Chidobere Nwa-David	CIVIL	Nanotechnology for Environmental Engineering	2020-21	2365-6379	63
38	Structural and modulus spectroscopy studies of Bi0.5(Na0.8K0.2)0.5TiO3 nano-polycrystalline ceramic	Ch.K. Varada Rajulu, S.Ramesh, V.Raghavendra,D. Gangadharudu ,K. Sambasiva Rao	H&BS	Journal of the Australian Ceramic Society	2020-21	0004-881x	64
39	Electron Beam Radiation Modification on Chemical, Thermal and Crystalline Properties of Poly (L-lactic acid)	N.Rajeswara Rao,B.Sanjeev Rao,T.Venkat appa Rao, P.S.V.Shanmu khi	H&BS	Indian Journal of Pure & Applied Physics	2020-21	0975-1041	65
40	Detection of copper by localized surface Plasmon resonance based fiber optic technique	P.V.N.Kishore , N.Aruna, B.M.Pratima, N.Rajeswara Rao, J.Ashok,K.Chandra Moali	H&BS	SPIE	2020-21	1996-756X	66
41	Carcinogenic chromium (VI) sensing using swelling characteristics of hydrogel on Fiber Bragg grating	N.Aruna, N.Rajeswara Rao, J.Ashok,P.V.N .Kishore	H&BS	SPIE	2020-21	1996-756X	67

ADITYA COLLEGE OF ENGINEERING & TECHNOLOGY SURAMPALEM

PRINCIPAL
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SURAMPALEM- 533 437

42	Multi U-bent cladded POF sensors for refractive index measurement	P.V.N.Kishore , N.Aruna, B.M.Pratima, N.Rajeswara Rao, J.Ashok	H&BS	SPIE	2020-21	1996-756X	68
43	Monitoring of pH by using stimulus responsive hydrogel and Fiber Bragg grating for bioreactor application	N.Aruna, N.Rajeswara Rao, J.Ashok,P.V.N .Kishore,K.Chandra Mouli	H&BS	SPIE	2020-21	1996-756X	69
44	Performance evaluation of square pyramid solar still with various vertical wick materials – An Experimental approach	M. Murugan A.Saravanan	MECH	Thermal Science and Engineering Progress	2020-21	1880-3989	70
45	An experimental investigation on effect of durability on strength properties of M40 grade concrete with partial replacement of sand with copper slag	J.Ushan Kranthi, A.Naga Sai, A.Rama Krishna	H&BS	Materials Today:Proceedings	2020-21	2214-7853	71
46	Microstructural Impedence and conductivity studies of magnecium doped Lithium Titanate Materials for Li-ion Batterries	B.Vikram Babu, M.Sushma Reddi, G.ChandanaK. Surendra,A.Rama Krishna, K.Samatha	H&BS	Materials Today:Proceedings	2020-21	2214-7853	72
47	Synthesis, characterization and electrical studies on Nb substituted L 4Ti 5012 anode materials for Li ion batteries	B.Vikram Babu, M.Sushma Reddi, K.Surendra, A.Rama Krishna, K.Samatah, V.Veeraiah	H&BS	Materials Today: Proceedings	2020-21	2214-7853	73
48	Enhanced Reliable Trust Management Framework for Mobile Ad-hoc Networks	SK.Ahmad Shah, Mohan Arava, Penmesta V.Krishna Raja	IT	The International journal of analytical and experimental modal analysis	2020-21	0886-9367	74
49	Cadmium substitution effect on structural, electrical and magnetic properties of Ni-Zn nano ferrites	P.Anantha Rao, V.Raghavendra Paulos Taddesse, N.Murali, B.Suryanarayana, P.V.S.K.Phanidhar Varma, R.Giri Prasad, Y.Rama Krishna,	H&BS	Results in Physics	2020-21	2211-3797	75

ADITYA COLLEGE OF ENGINEERING & TECHNOLOGY SURAMPALEM

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SURAMPALEM- 533 437

		K.Chandramouli					
50	Optical and luminescence properties of pure, iron-doped, and glucose capped ZnO nano particles	Umesh Reddy,Gudla, B.Suryanaraya na, V.Raghavendr a, K.A.Emmanue l, N.Murali, Paulos Taddeesse, D.Prajuli, K.Chandra Babu Naidu, Y.Rama Krishna	H&BS	Results in Physics	2020-21	2211-3797	76
51	Enhancing Productivity of V-Trough Solar Water Heater Incorporated Flat Plate Wick-Type Solar Water Distillation System	M.Murugan, A.Saravanan, G.Murali, Pramod Kumar, Siva Nagi Reddy	MECH	J. Heat Transfer	2020-21	0022-1481 1528-8943	77
52	NFC Based Data Monitoring and Medication Scheduling for Patients in Hospitals	E. Immanuvel Bright, Karthik, T.S, Senthamil selvis , S, P. Ramesh Kumar, R.V. Vijaya Krishna, Susheela Devi B Devaru, T.C. Manjunath	ECE	Materials Today:Proceedings	2020-21	2214-7853	78
53	Implementation of Wireless home-based Automation and Safety Arrangements Using Power Electronic Switches	R.Geethamani, T.S.Karthik,M .Deivakani, shalJain, AnanMohan, MeenuChopra, CosmenaMahapatra, T.C.Manjunath	ECE	Materials Today: Proceedings	2020-21	2214-7853	79
54	On-Chip Cache Memory Protection with Tag Overflow Buffers and VLSI Implementation	S. Vijayanand M. Deivakani Karthik Thirumalai Sampath Anand Mohan Makarand Upadhyaya	ECE	Materials Today: Proceedings	2020-21	2214-7853	80

ADITYA COLLEGE OF ENGINEERING & TECHNOLOGY SURAMPALEM

PRINCIPAL
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SURAMPALEM- 52[illegible]

		T.C. Manjunath					
55	Analysis of Power Flow in Grid-tied Voltage Source Inverter System,	Sravani Addanki, Sai Ravi Teja Devabttula, R Venkatesh	EEE	Adalya journal	2020-21	1301-2746	81
56	Comparative Analysis of Two-Level and Multi-Level Inverter Configuration	Chinthapalli Akhil Reddy, P V Sainath, G Siva Ramakrishna, M P Subba Raju	EEE	Adalya journal	2020-21	1301-2746	82
57	Design of Virtual Laboratory for Digital Signal Processing Course	G Naveen Kumar, J Gouri Shankar, A V S P Mahesh, R Srinivas	EEE	Adalya journal	2020-21	1301-2746	83
58	Study of direct torque control scheme for 3-phase induction motor	S Chandra Sekhar, N Bobby, Y Rajendra, K Varalakshmi	EEE	Studia Rosen thaliana	2020-21	1781-7838	84
59	Stability analysis of integer order interval system using Kharitonov Theorem	M. Jagannadham, R Shiva Shankar, B Ganesh Kumar, V U P Lavanya	EEE	Studia Rosen thaliana	2020-21	1781-7838	85
60	Effect of cr substitution on magnetic properties of co-cu Nano Ferrites	P.V.S.K.Phani dhar Varma, B.Suryanarayana, V.Raghavendra, D.Prajuli, N.Murali, K.Chandramouli	H&BS	Solid state technology	2020-21	0038-111X	86
61	On Spectral Relaxation Approach for Thermal Diffusion and Diffusion Thermo Effects on Viscous Dissipative Casson Fluid Through a Stretched Surface	Mouli, G.B.C., Gangadhar, K. & Raju	H&BS	International Journal of Applied and Computational Mathematics	2020-21	2199-5796	87
62	Biologically synthesized silver nano particles from shoreal Robusta L. Plant and associated antibacterial property	P.Koteswara Rao, B.Vikram Babu, M.Sushma Reddi, K.Anjana	H&BS	Materials Today:Proceedings	2020-21	2214-7853	88

ADITYA COLLEGE OF ENGINEERING & TECHNOLOGY SURAMPALEM

PRINCIPAL
Aditya College of Engineering & Technology
SURAMPALEM- 533 437

		Devi, A.Rama Krishna					
63	Anticancer and antibacterial activity of green sysnthesized siver nanoparticles using Adina cordifolia	P.Koteswara Rao, S.Srinivasulu, M.Ravindra nadh, B.Vikram Babu, M.Sushma Reddi, A.Rama Krishna	H&BS	Materials Today:Proceedings	2020-21	2214-7853	89
64	Thermal Management in TSV based 3D IC Integration	Venkata Kiran Sanipini, Banothu Rakesh, Aruna Jyothi Chamanthula, N.Santhoshi, A.Arun Kumar Gudivada	ECE	Materials Today:Proceedings	2020-21	2214-7853	90
65	A Systematic review on full adder designs in Quantum dot cellular automata	A.Arun Kumar Gudivada, Gnanou Florence Sudha	ECE	Materials Today:Proceedings	2020-21	2214-7853	91
66	Novel optimized tree-based stack-type architecture for 2n-bit comparator at nanoscale with energy dissipation analysis	A.Arun Kumar Gudivada, Gnanou Florence Sudha	ECE	The Journal of Supercomputing	2020-21	1573-0484	92
67	Microstructural, thermal, electrical and magnetic analysis of Mg substituted Cobalt ferrite	Shaik Jesus Mercy, N.Murali, A.Ramakrishna, Y.Rama Krishna, V.Veeraiah, K.Saimatha	H&BS	Applied Physics	2020-21	1432-0630	93
68	Intelligent signalling system to control traffic in vehicular ad hoc networks	R.V.S.Lalitha, Srinivas R, Kumar PSVVSR, Kavitha K,Sameera PVSNS	CSE	Indian Journal of Science and Technology	2020-21	0974-5645	94
69	Mechanical and microstructural characterization nickel electroplated 4 metal matrix composites	Nitla Stanley Ebenezer, P.S.V.V.Narayana, A.Ramakrishn	H&BS	Materials Today:Proceedings	2020-21	2214-7853	95

ADITYA COLLEGE OF ENGINEERING & TECHNOLOGY SURAMPALEM

PRINCIPAL
Aditya College of
Engineering & Technology
SURAMPALEM- 533 437

		a, Chodisetti Naga Sandeep, Gorthi Siva Vijaya Penke, Pragnan Manipala Thotakura, SriSatya Dhanesha					
70	Inspection of dynamic power in micro-grid system during impedance-based compensation	S.Vijayanand, RajaniBoddepalli, K.G.S.Venkatesan, Makarand Upadhyaya, J.Karthika, M.Jemimah Carmicha,T.C. Manjunath	EEE	Materials Today:Proceedings	2020-21	2214-7853	96
71	An Efficient Energy Management of Hybrid Renewable Energy Sources Based Smart-Grid System Using an IEPC Technique	K. Bapayya Naidu, B. Rajani, A. Ramesh, K. V. S. R. Murthy	EEE	Sustainable Communication Networks and Application	2020-21	2367-4512	97
72	NSCT and eigen features based image fusion	S.B.G.Tilak Babu, R.V.V.Krishna, I.Srinivasa Rao, P.Ramesh Kumar	ECE	Solid state technology	2020-21	0038-111X	98
73	Colour image segmentation using soft rough fuzzy CMeans and Local Binary Pattern	R.V.V.Krishna, S.Srinivas Kumar	ECE	Intelligent Automation And Soft Computing	2020-21	2326-005X	99
74	Prediction and Analysis of Corona Virus Disease (COVID-19) using Cubist and OneR	R.V.S.Lalitha, J. Divya Lalitha, K. Kavitha, T RamaReddy,Rayudu Srinivas, Challapalli Sujana	CSE	IOP Conference Series: Materials Science and Engineering	2020-21	1757-899X	100
75	Machine Learning Based Classification for Heart Disease Prognosis	Divya Lalita Sri Jalligampala, R.V.S. Lalitha, A. Phani Sridhar, SSVSR Kumar Pullela	CSE	International Journal of Advanced Science and Technology	2020-21	2207-6360	101

ADITYA COLLEGE OF ENGINEERING & TECHNOLOGY SURAMPALEM

Aditya College of
Engineering & Technology
SURAMPALEM- 533 437

76	A Novel Approach to provide more Security for Multi-Click Recognition based Textual Graphical Scheme (SMCR-TG)	Nalla Akhila, Divya Lalita Sri Jalligampala, Udayabhanu N P G Raju, A Sri Sudha	CSE	Journal of Xidian University	2020-21	1001-2400	102
77	Disabled chronicle management using Blockchain technology	Challapalli sujana, R.V.S.Lalitha, Mylavarapu Kalyan Ram, S.V.V.S.R. Kumar Pullela	CSE	International Journal of Advanced Science and Technology	2020-21	2005-4238	103
78	A Framework for Subset Pruning using REP	R.V.S.Lalitha, Chaallapalli Sujana, Dr.K.Kavitha, Mylavarapu Kalyan Ram	CSE	International Journal of Advanced Science and Technology	2020-21	2005-4238	104
79	Corona Disease Clustering Using Radial Basis Function Classifier	R.V.S.Lalitha, G.Jaya Suma	CSE	International Journal of Advanced Science and Technology	2020-21	2005-4238	105
80	Analyzing the impact of Corona Symptoms using Correlation	R.V.S.Lalitha, G.Jaya Suma	CSE	Journal of Critical Reviews	2020-21	2394-5125	106
81	Predicting Rise and Spread of COVID-19 Epidemic using Time Series Forecasting Models in Machine Learning	Ch. V. Raghavendran , G. Naga Satish,Vempati Krishna, Shaik Mahaboob Basha	IT	International Journal on Emerging Technologies	2020-21	2249-3255	107
82	Predicting Coronary Heart Disease: A Comparison between Machine Learning Models	K. Helini, K. Prathyusha, K. Sandhya Rani, Ch. V. Raghavendran	IT	International Journal of Advanced Science and Technology	2020-21	2005-4238	108
83	Internet of Things Flood Prediction Architecture using Naive Bayes, Non- Linear Support Vector Machines (SVM) and MultiLayer Perceptron (MLP) Classifiers	Kovvuri N Bhargavi ,G.Jaya Suma	IT	International Journal of Advanced Science and Technology	2020-21	2005-4238	109
84	Microstructural and electric properties of Mg. substituted Li4 Ti5 O12 synthesized by ceramic method	B.Vikram Baba, M.Sushma Reddi, G.Chandana, A.Rama Krishna, N.Gna ma Praveena,	H&BS	AIP Conference Proceedings	2020-21	1551-7616	110

ADITYA COLLEGE OF ENGINEERING & TECHNOLOGY SURAMPALEM

PRINCIPAL
Aditya College of
Engineering & Technology
SURAMPALEM- 533 437

		V.Kondala Rao, M.Tulu Wegayehu, J.Suresh, B.Trinadh, K.Samatha, V.Veeraiah					
85	PERFORMANCE EVOLUTION OF NOISE COUPLING ON GERMANIUM BASED TSV FILLED MATERIAL FOR FUTURE IC INTEGRATION TECHNIQUE	G.A. ARUN KUMAR,AlluriNavaneetha, A.Kishore Reddy,S.Aruna Deepthi,Ch.Usha Kumari,PraveenKumar Poola,MattaDurga Prakash,Asisa Kumar Panigrahy	ECE	Materials Today:Proceedings	2020-21	2214-7853	111
86	DESIGN OF AREA-EFFICIENT HIGH SPEED 4*4 WALLACE TREE MULTIPLIER USING QUANTUM - DOT CELLULAR AUTOMATA	G.A. ARUN KUMAR,K.Jayaram Kumar,Srinivasa RaoJajula,Durga PrasadSiddani, Praveen KumarPoola, VarunVourgunti,Asisa KumarPanigrahy	ECE	Materials Today:Proceedings	2020-21	2214-7853	112
87	Content based image retrieval system based on fusion of wavelet transform, texture and shape features	D.Kishore, Ch.Srinivasa Rao	ECE	Mathematical Modelling of Engineering Problems	2020-21	2369-0739	113
88	Synthesis, structural, dielectric and magnetic properties of cobalt ferrite nanomaterial prepared by sol-gel autocombustion technique	Tulu Wegayehu Mamma, N. Murali, Ch VijayaKumari, S.J.Margarette, A.Ramakrishna, RaghavendraVemuri, Y.B.Shankar Rao, K.L.Vijaya Prasad, Y.Rama	H&BS	Physica B: Physics of Condensed Matter	2019-20	0921-4526	114

ADITYA COLLEGE OF ENGINEERING & TECHNOLOGY * SURAMPALEM *

PRINCIPAL
Aditya College of
Engineering & Technology
SURAMPALEM- 533 437

		Krishna, K.Samatha					
89	Experimental studies on damping behaviour of nickel electroplated A356.2 alloy	NitlaStanley Ebenezee, P.S.V.V.Sridhar i, Chituri Ram Prasad	MECH	Materials Today: Proceedings	2019-20	2214-7853	115
90	Exploiting Ensemble Learning for Rainfall Prediction using Meta Regressors and Meta Classifiers	Kovvuri N Bhargavi, G.Jaya Suma	IT	International Journal of Engineering and Advanced Technology	2019-20	2249-8958	116
91	Investigation of numerical modelling of TIG welding of austenitic stainless steel (304L)	Pramod Kumar, RajeshKumar, AbdulArif, M.Veerababu	MECH	Materials Today: Proceedings	2019-20	2214-7853	117
92	Study of microstructure and mechanical properties of aluminium alloy (AA-6351-T6) using friction stir welding.	Pramod Kumar, RajeshKumar, BideshKumar Hembram, M.Murugan, AbdulArif, M.Veerababu	MECH	Materials Today: Proceedings	2019-20	2214-7853	118
93	Performance and emission characteristics of variable compression ratio CI engine fueled with dual biodiesel blends of Rapeseed and Mahua Fuel	M. Murugan,A.Saravanan, M.Sreenivasa Reddy, SatyajeetParida	MECH	Fuel	2019-20	0016-2361	119
94	Chunk Irrigation of Farm Field-Through Wireless Sensing Technique	Shaik Vahida, Rayudu Srinivas, Rama Reddy T, Sheik Shabuddin, B.Durga Anuja	CSE	International Journal of Innovative Technology and Exploring Engineering	2019-20	2278-3075	120
95	Enhancing clinical decision support systems using supervised learning methods	T.Srinivasulu , S.Srujan, Ch.V.Raghavendran	IT	The International Journal of analytical and experimental modal analysis	2019-20	0886-9367	121
96	Performance Analysis of Grid Synchronization Method for Three Phase Three-wire Networks under Grid fault conditions	Tirumala Anitha Rajani Boddepalli G Seshadri Ch Kamal	EEE	Waffen-und Kostumkunde	2019-20	0043-9045	122

ADITYA COLLEGE OF ENGINEERING & TECHNOLOGY SURAMPALEM

PRINCIPAL
Aditya College of
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SURAMPALEM- 533 437

97	Performance Analysis of Direct-quadrature in Three Phase Induction Motor drive	G.Seshadri, B.Rajani, S. Arul kumar, C. K. Kishore, V.C. Jagan mohan, S. Sivaganesan	EEE	Studia Rosen thaliana	2019-20	1781-7838	123
98	Design of Baugh-Wooley Multiplier in Quantum-dot Cellular Automata using a novel 1-bit Full Adder with Power dissipation analysis. SN Applied Sciences	G. A. Arunkumar,G nanosi Florence Sudha	ECE	SN Applied Sciences	2019-20	2523-3971	124
99	PI and Fuzzy Controller Utilizing PV-HESS Based Zeta Converter for BLDC Motor Drive	B. Rajani, G. Seshadri, T. Anil Kumar, V. Chandra Jagan Mohan	EEE	International Journal of Recent Technology and Engineering	2019-20	2277-3878	125
100	Optimal Conductor selection and Capacitor Placement for Cost minimization in Distribution Systems	KRKV. Prasad, Kollu Ravindra	EEE	International Journal of Advanced Scientific Research and Management	2019-20	2448-6378	126
101	Digitalized Sychronization of multi level STATCOM with Switch fault elimination	K.Varalakshmi, R. L. Narasimham, G. Tulasiramdas	EEE	International Journal of Recent Technology and Engineering	2019-20	2277-3878	127
102	Smart Basket Algorithmic approach for shopping in super markets using rechargeable smart card	Haritha D, Suryakala Nagireedi	IT	International Journal of Research and Analytical Reviews	2019-20	2348-1269	128
103	Semi-equalizing load in multi-hop wireless networks	Abhishek Reddy, B., Kavitha, K. Manukonda ,R.V.S.Lalitha ,Krishna Rao	CSE	International Journal of Innovative Technology and Exploring Engineering	2019-20	2278-3075	129
104	An effective system to detect fake research	Mounika, Kavitha,R.V.S .Lalitha	CSE	International Journal of Innovative Technology and Exploring Engineering	2019-20	2278-3075	130
105	Data offloading for effective rescue operations during fire disaster management	Kavitha, R.V.S.Lalitha, Suneetha,	CSE	International Journal of Engineering and Advanced Technology	2019-20	2249-8958	131
106	Smart surveillance with smart doorbell	R.V.S.Lalitha, Kavitha, K., Krishna Rao, N.V., Rama	CSE	International Journal of Innovative Technology	2019-20	2278-3075	132

ADITYA COLLEGE OF ENGINEERING & TECHNOLOGY SURAMPALEM

Aditya College of Engineering & Technology SURAMPALEM- 533 437

		Mounika, G., Sandhya		and Exploring Engineering			
107	EPNN based high secure intensive hidden digital watermark applications in telemedicine	R.Sailaja, Ch.Rupa, A.S.N.Chakravarthy	CSE	Advances in modelling and analysis	2019-20	1258-5769	133
108	Effect on Structural and Magnetic Properties of Mg^{2+} Substituted Cobalt Nano Ferrite	V.Raghavendra, G.Raju,M.Gnana Kiran,M.S.N. A.Prasad,E.Rajesh,G.Pavan Kumar, N.Murali	H&BS	Results in Physics	2019-20	2211-3797	134
109	Dielectric and Piezoelectric Properties of Sm^{3+} doped Lead Barium Niobate (PBN) Ceramics	V.Raghavendra, P.Viswarupachary, B.Suryanarayana, K.Chandra Mouli, G.N.V.R.Vikram,N.Murali	H&BS	Physica B: Condensed Matter	2019-20	0921-4526	135
110	Effect of Zn – Cr Substitution on the Structural, Magnetic and Electrical Properties of Magnesium Ferrite Materials	S. YonatanMulushoa, Ch VijayaKumari, V. Raghavendra, K. EphraimBabu, B.S.N.Murthy, KundavarapuSuribabu, Y.Ramakrishna, N.Murali	H&BS	Physica B: Condensed Matter	2019-20	2250-2130	136
111	Synthesis, Structural and Magnetic properties of Srfe12O19 Hexaferrites	S. J. Margarette, a. Venkateswara rao, v.raghavendra, n. Murali, y. Ramakrishna, v. Veeraiah, m. Indira devi	H&BS	International Journal of Scientific & Technology Research	2019-20	2277-8616	137
112	On spectral relaxation approach for soret and dufour effects on Sutterby fluid past a stretching sheet	G.B.Chandra Mouli, Kotha Gangadhar, B.Hema Sundar Raju	H&BS	International Journal of Ambient Energy	2019-20	0143-0750	138

ADITYA COLLEGE OF ENGINEERING & TECHNOLOGY SURAMPALEM

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SURAMPALEM- 533 437

113	Improving Performance of a Trapezoidal-trough Thermosyphon Solar Collector using Peripherally Wing-cut Swirl Generator	M. Murugan, R. Vijayan, A.Saravanan	MECH	International Journal of Green Energy (Taylor & Francis)	2019-20	1543-5075	139
114	Mechanical and Dry Sliding Wear Behaviour of Al6061/Gr MMCs and its Multi Response Optimization using Hybrid Fuzzy Grey Relational Technique	Gangadhara Rao P, Pandu R V. K. Meera Saheb	MECH	International Journal of Innovative Technology and Exploring Engineering	2019-20	2278-3075	140
115	Influence of corrugated booster reflectors in a centrally finned twist inserted solar thermal collector on heat transfer and thermal performance characteristics	M. Murugan, R. Vijayan, A.Saravanan, S. Jaisankar	MECH	Journal of Heat Transfer	2019-20	062001-9	141
116	A Review on Surface Modifications and Coatings on Implants to Prevent Biofilm	P. S. V. V. Srihari, P. S. V. V. S. Narayana	MECH	Regenerative Engineering and Translational Medicine	2019-20	2193-1801	142
117	Biofilm Resistant Surfaces and Coatings on Implants	P. S. V. V. Srihari, P. S. V. V. S. Narayana	MECH	Materials Today:Proceedings	2019-20	2214-7853	143
118	Experimental study on a shell and tube heat exchanger with novel self agitating inserts	P. S. V. V. Srihari, P. S. V. V. S. Narayana, V. Hemanth Kumar, V. S. Surya Prakash, P. Jaikishan	MECH	AIP Conference Proceedings	2019-20	2200-020039	144
119	Influence of slat and flaps arrangement on the performance of modified Darrieus wind turbine	P. S. V. V. Srihari, P. S. V. V. S. Narayana, K. Lakshman Rao, J. Durga Venkatesh, P. Rajesh	MECH	AIP Conference Proceedings	2019-20	2200-020012	145
120	Thermal performance investigation of MMC heat sinks for low CTE electronic components cooling	P. S. V. V. Srihari, P. S. V. V. S. Narayana, G. V. Prasada Rao, M. Ranibabu, V. S. Surya Prakash	MECH	AIP Conference Proceedings	2019-20	2200-020034	146
121	Comparative analysis of pulsed Nd: YAG laser welding of 304L and 904L stainless steel	Pramod Kumar, RajeshKumar, AbdulArif, M.Veerababu	MECH	Materials Today:Proceedings	2019-20	2214-7853	147

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PRINCIPAL
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SURAMPALEM- 533 4

122	Enhancing productivity of V-trough solar water heater incorporated flat plate wick type solar water distillation system	M. Murugan, A. Saravanan, G. Murali, Pramod Kumar, V. Siva Nagi Reddy	MECH	Journal of Heat Transfer	2019-20	063001-9	148
123	Predicting the cost of pre-owned cars using Classification techniques in Machine Learning	B. Lakshmi Sucharitha, Ch. V. Raghavendran , B. Venkataraman a	IT	Lecture Notes in Networks and Systems, Advances in Computational Intelligence and Informatics	2019-20	2193-1801	149
124	Group Key Management Protocols for Secure Group Communication over Internet of Things	Ch. V. Raghavendran , G. Naga Satish, P. Suresh Varma	IT	Emerging Trends in Computing and Expert Technology	2019-20	1344-1350	150
125	House Price Prediction Using Machine Learning	G. Naga Satish, Ch. V. Raghavendran , M.D.Sugnana Rao, Ch.Srinivasulu	IT	International Journal of Innovative Technology and Exploring Engineering	2019-20	2278-3075	151
126	Implementation of a Game Based Learning model using Sequence Square Box Technique	Karthik, T.S, Senthamil Selvi S	ECE	International Journal on Recent Technology and Engineering	2019-20	2277-3878	152
127	Accurate and Timely Prediction of Rice crop disease by means of machine learning algorithms	Satish Thatavarti,Chi lumuru Suresh, Kolli Kamakshaiah	CSE	International Journal of Advanced Science and Technology	2019-20	2005-4238	153
128	Irrigation Made Easy: Block Wise Filling Of Firm Filed Using WSN System	Shaik Vahida, Rayudu Srinivas, Rama Reddy T, Sheik Shabuddin, B. Durga Anuja	CSE	International Journal of Scientific & Technology Research	2019-20	2277-8616	154
129	Experimental study on vortex intensification of gravitational water vortex turbine with novel conical basin.	P. S. V. V. Srihari, P. S. V. V. S. Narayana, K. V. V. S. Sanath Kumar, G. Jaya Raju, K. Naveen, P. Anand	MECH	AIP Conference Proceedings	2019-20	2200-2008	155

ADITYA COLLEGE OF ENGINEERING & TECHNOLOGY SURAMPALEM

PRINCIPAL
Aditya College of
Engineering & Technology
SURAMPALEM- 533 437

130	Counterfeiting threats in IoT	Kavithu, R.V.S.Lalitha, Suneetha, T.V., Usha Sree	CSE	International Journal of Innovative Technology and Exploring Engineering	2019-20	2278-3075	156
131	Ordered Local Binary Pattern (OLBP) for Classification of Textures	M. Anil Kumar, Ravi babu Uppu	CSE	International Journal Recent Technology and Engineering	2018-19	2277-3878	157
132	Deceased Leaf Identification Using The Geometric Local Binary Patterns (GLBP)	M.Anilkumar, Ravi Babu Uppu	CSE	ARPN Journal of Engineering and Applied Sciences	2018-19	9012-9019	158
133	Intensifying the security of information by the fusion of random substitution technique and enhanced DES	R .Sailaja,Ch. Rupa,A. S. N. Chakravarthy	CSE	Smart Innovation, Systems and Technologies	2018-19	2190-3018	159
134	A novel integrated approach using Euclid's and fuzzy logic for secure communication	R.Sailaja, Ch.Rupa, A.S.N.Chakravarthy	CSE	International Journal of Information Privacy, Security and Integrity	2018-19	19301650	160
135	Comparative Study of Synthesis, Structural and Magnetic Properties of Cu2+ substituted Co-Ni, Co-Zn and Co-Mg Nano Ferrites	A. Rama Krishna, N.Muralia, S.J.Margarettea, K.Samathua, V.Veeraiah	H&BS	Physica of Condensed Matter	2018-19	2250-2130	161
136	Studies on structural magnetic and DC electrical resistivity properties of $CO_{0.5}M_{0.5}Cu_{0.1}Fe_2O_4$ (M=Ni, Zn and Mg) ferrite nanoparticle systems	A. Rama Krishna, N.Murali, S.J.Margarette , T.Weguyehu Mammo, N.Krishna Jyothi, B.Sailaja, Ch.C.Sailaja Kumari,K.Samatha, V.Veeraiah	H&BS	Advanced Powder Technology	2018-19	0921-8831	162
137	A Novel Speech Comparison Technique using Optimized Wavelet Transform to Improve the Quality of Auditory Perception under Low SNR Conditions	B.V.Vijaysri	ECE	International Journal of Simulation Systems, Science & Technology	2018-19	1473-8031	163
138	Transformation based Speech Compression for Improving Speech perception under Low SNR Conditions	B.V.Vijayasri, I.Santhi Prabha	ECE	International Journal of Research	2018-19	2229-5518	164

ADITYA COLLEGE OF ENGINEERING & TECHNOLOGY SURAMPALEM

PRINCIPAL
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Engineering & Technology
SURAMPALEM-533 437

139	IOT Based Real Time Early Warning Bus Information System to Students by E-mail	P. Swarnalatha, A.Rama Vasantha	ECE	International Journal of Creative Research Thoughts	2018-19	2320-2882	165
140	Smart Wearable Device for Child Protection	S. Annapurna Devi,V.Preethi	ECE	International Journal of Creative Research Thoughts	2018-19	2320-2882	166
141	Raspberry PI Based Passenger Car for Road Safety	R. Sai Lakshmi, P.Bhavani Shankar	ECE	International Journal of Engineering and Technology	2018-19	1793-8236	167
142	Design and Implementation of an IOT based Efficient and Intelligent Smart Bins by using Raspberry Pi	K.Parvateesam, Satya Sruthi P	ECE	International Journal of Advanced Research in Electrical, Electronics and Instrumentation Engineering	2018-19	2278-8875	168
143	The Effect of Electron Beam Irradiation on Physicochemical Properties of Potato Starch	N.Rajeswara Rao,B.Sanjeev Rao, S.V.S.Rama Reddy,T.Venkatappa Rao	H&BS	International Conference on Renewable Energy Research and Education	2018-19	040030-1	169
144	Thermal Properties of Polypropylene/Strontium Carbonate (srco3) Nanocomposites	P.S.V. Shanmukhi, K.Chandra Mouli, N.Rajeswara Rao, V.Raghavendra	H&BS	International Journal of Basic and Applied Research	2018-19	2395-3438	170
145	Structural Morphological Properties of Polypropylene/Strontium Carbonate (Scro3) Nanocomposites	P.S.V. Shanmukhi, K.Chandra Mouli, N.Rajeswara Rao, V.Raghavendra, K.S.K.R.Chandra Sekhar	H&BS	Journal of Applicable Research	2018-19	2349-555X	171
146	Eccentric operation of STATCOM Using Predictive Controller	K. Varalakshmi, Narasimham R.L, G. Tulasi Ramdas	EEE	International Journal of Power Electronics and Drive System	2018-19	2088-8694	172

ADITYA COLLEGE OF ENGINEERING & TECHNOLOGY SURAMPALEM

PRINCIPAL
Aditya College of
Engineering & Technology
SURAMPALEM - 533 437

147	Effect of Compression Ratio on Nano -Particle Doped Fuel Blends in Unmodified Research Engine	H. Suresh Babu Rao,T. Venkateswara Rao,K. Hema Chandra Reddy	MECH	International Journal of Ambient Energy	2018-19	0143-0750	173
148	Effect of Exhaust Gas Recirculation on a Nanoparticle-Doped Biodiesel and Diesel-Blends-Fuelled Diesel Engine	H. Suresh Babu Rao,T. Venkateswara Rao,K. Hema Chandra Reddy	MECH	International Journal of Ambient Energy	2018-19	0143-0750	174
149	Influence of Injection Timing on Cerium oxide nano particle doped in waste cooking palm oil Bio-Diesel blends fueled in diesel engine	H. Suresh Babu Rao,T. Venkateswara Rao,K. Hema Chandra Reddy	MECH	International Journal of Ambient Energy	2018-19	0143-0750	175
150	Investigation on Properties of PET and HDPE Waste Plastic Concrete	M.Maheswara Rao, Ramakrishna Gangadhar Ravula	CIVIL	International Journal for Research in Applied Science and Engineering Technology	2018-19	2321-9653	176
151	A comprehensive study of mechanical propertie of Nominal grade concrete using copper slag as partial replacement to fine aggregate	Usha Kranti J, Srinivasu K, A.Naga Sai	CIVIL	International Journal of Engineering & Technology	2018-19	1793-8236	177
152	Video watermarking with curvelet transform	D.Kishore, K.Meenakshi, Padmavathi Kora	ECE	International Journal of Innovative Technology and Exploring Engineering	2018-19	2278-3075	178
153	PIFA Antenna for Wireless Communications	V. Preethi, S.Annapurna Devi	ECE	International Journal of Engineering and Techniques	2018-19	2395-1303	179
154	INTELLIGIBILITY MEASURE OF A TIME-FREQUENCY WEIGHTED COMPRESSED NOISY SPEECH	B.V.Vijayasri, I.Santhi Prabha	ECE	International Journal for Innovative Engineering and Management Research	2018-19	2456-5083	180
155	Design and Implementation of IOT Based Smart Surveillance and Intelligent Monitoring System Using Raspberry Pi	K.Parvateesam, B.Divakar	ECE	International Journal of Engineering and Techniques	2018-19	2395-1303	181
156	Effect of chromium substitution on the structural and magnetic properties of cobalt ferrite	G.Raju, N.Murali,M.S. N.A.Prasad, B.Suresh,D. AppaRao	ECE	Materials Science for Energy Technologies	2018-19	2589-2991	182

ADITYA COLLEGE OF ENGINEERING & TECHNOLOGY SURAMPALEM

PRINCIPAL
Aditya College of
Engineering & Technology
SURAMPALEM- 533 437

		Babu, M.Gnana Kiran, A. Rama Krishna, M.Tulu Wegayehu,B. Kishore Babu					
157	Design of high speed Wallace tree multiplier using 8-2 and 4-2 adder compressors	E. Jagadeeswara Rao K.Jaya Ram Kumar,T.V.Prasad	ECE	International Journal of Engineering & Technology	2018-19	1793-8236	183
158	Modified OFDM Receiver Design with Improved Channel Capacity	R.Anil Kumar, K.Satya Prasad	ECE	International journal of Engineering & Technology	2018-19	1793-8236	184
159	Out-of-Band Radiation, PAPR and SER Analysis for Future Wireless (5G) Communications	R.Anil Kumar, K.Satya Prasad	ECE	Journal of Advanced Research in Dynamical & Control Systems	2018-19	1943-023X	185
160	Design and Implementation of High Speed Modified Russian Peasant Multiplier using 8-2 Adder Compressors	E. Jagadeeswara Rao, A.Rama Vasantha	ECE	International Journal of Research and Computer Engineering	2017-18	2229-5518	186
161	Comparative Study of Synthesis, Structural and Magnetic Properties of Cu2+ substituted Co-Ni, Co-Zn and Co-Mg Nano Ferrites	A. Rama Krishna, N.Muralia, S.J.Margarettea, K.Samathaa, V.Veeraiah	ECE	Physics of Condensed Matter	2017-18	2250-2130	187
162	Leaf Classification Using Completed Local Binary Pattern of Textures	M.Anil Kumar, Ravi Babu Uppu	CSE	International Journal of Innovations & Advancement in Computer Science	2017-18	2347-861b	188
163	An overview on Image retrieval using Image processing techniques	Ch.Sujana, M.Kalyan Ram	CSE	International Journal of Computer Science and Technology	2017-18	2347-8578	189
164	An overview on multimedia data mining and its relevance today	Ch.Sujana, M.Kalyan Ram	CSE	International Journal of Computer Science and Technology	2017-18	2347-8578	190
165	Reducing Security Feebleness Issues in Centralized Server Data by the Attackers using Sensors	R.V.S.Lalitha, G.Jaysuma	CSE	International Journal of Engineering Applied Sciences and Technology	2017-18	2455-2143	191

ADITYA COLLEGE OF ENGINEERING & TECHNOLOGY SURAMPALEM

PRINCIPAL
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Engineering & Technology
SURAMPALEM- 533 437

166	Electronic Customer Relationship Management for Customer Satisfaction in Online Banking with Special Reference to ICICI Bank in Kakinada	K. Shanker Ganesh, B.Swathi Devi	H&BS	International Journal for Research and Development in Technology	2017-18	2349-3585	192
167	Simultaneous DG and Capacitor Placement for Energy Loss Minimization with Constant and Time Varying Load Profile	K. Ravindra, K. R. K. V Prasad, M. N. Rao, and R. S. Rao	EEE	International Journal of Control Theory and Applications	2017-18	0974-5572	193
168	Multipart transmission optimized shortest acknowledge based neighbour discovery	Sk.Ahmed Shah, P.V.Krishna Raja	IT	International Journal of scientific research in Science and Technology	2017-18	2395-6011	194
169	Multihop Transport Protocol Communication route switching for Mobile Ad hoc Networks	Sk.Ahmed Shah, P.V.Krishna Raja	IT	International Journal of scientific research in Science and Technology	2017-18	2395-6011	195
170	Efficient Parallel Key Management for Distributed Data Security in Content Delivery Networks	Sk.Ahmed Shah, P.V.Krishna Raja	IT	International Journal of scientific Research in computer Science, Engineering and Information Technology	2017-18	2456-3307	196
171	Smart Mobile TV in the Technological Phones Integrating with Cloud Based Social Media Service	Sk.Ahmed Shah, P.V.Krishna Raja	IT	International Journal of Scientific Research and Scientific Innovation	2017-18	2319-7064	197
172	Stabilization of Expansive Clay using RHA and TSP	Md Abdul Shukoor, J Chandini Devi, Mycherla Chaitanya,M Divya Tejaswi	CIVIL	International Journal for Research in Applied Science and Engineering Technology	2017-18	2321-9653	198
173	An Efficient Leaf(Texture) Classification using Local Binary Pattern with Noise Correction	M.Anil Kumar, Ravi Babu Uppu	CSE	Journal of Engineering and Applied Sciences	2017-18	1818-7803	199
174	Robust and Indiscernible Multimedia Watermarking Using Light Weight Mutational Methodology	Mrs. R.Sailaja, Ch.Rupa, A.S.N.Chakravarthy	CSE	Traitement du signal	2017-18	2041-9031	200

ADITYA COLLEGE OF ENGINEERING & TECHNOLOGY SURAMPALEM

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SURAMPALEM- 533 437

175	Crop Coverage Data Classification using Support Vector Machine	Tarun Rao, N. Rajasekhar, N C Naveen	CSE	Global Journal of Computer Science and Technology	2016-17	0975-4350	201
176	Design and Analysis of ICEBar Shaped Patch Antenna Parameter Using HFSS	Basheer Ali Sheik, K L V Prasad, A.Arun Kumar Gudivada	ECE	The International Journal Of Science, Engineering &Technology Research	2016-17	2278-7798	202
177	Study of Factors Affecting Investment Decisions of Investors with Special Reference to Equity Market in Selected Areas of Kakinada District (A.P)	N.S.V.N.Raju, Anita Patra	MBA	The International Manager	2016-17	2348-9405	203
178	Structural Morphology and Thermal Properties of Polypropylene / Barium Carbonate Nano-composites	P. S. V. Shanmukhi, K. CHANDRA MOULI	H&BS	International Journal of Nanotechnology and Application	2016-17	0973-631X	204
179	A hybrid approach to data dissemination in exigency situations	G.Jaya Suma, R.V.S.Lalitha	CSE	Wireless Networks	2016-17	1022-0038	205

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SURAMPALEM- 533 437

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ORIGINAL CONTRIBUTION

Effect of Heat Treatment on the Corrosion Behaviour of Nickel Surface-Deposited Agro-Reinforced Metal Matrix Composites

Nitla Stanley Ebenezer[1] · B. Vinod[2] · Hanumanthu Satya Jagadesh[3]

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Abstract In the perspective of world's apprehension with the environment, the current work proposes to determine an alternative way for disposing bamboo leaf ash (BLA) residual debris. The widespread utilization of bamboo results in widespread accumulation of bamboo leaf residual wastes, and the unchecked burning of the residual debris for the disposal of bamboo leaf stages a grave threat for both human and environment. The higher reserves of siliceous and aluminous materials in bamboo leaf ash can be used as effective filler material during the fabrication of several eco-friendly, low-cost, low-weight, amply available composite material systems. The current research chiefly aspires for inspecting the heat treatment characteristics of nickel-deposited aluminium-reinforced bamboo leaf ash composites. Al-BLA composites are fabricated by engaging a classic stir casting practice varying the reinforcement compositions, i.e. wt.% 2, 4, 6. The fabricated Al-BLA composites are nickel plated by employing a customary stirred watts bath. Potentiodynamic polarization tests have been executed for assessing the corrosion behavioural traits of the composites preceding and succeeding the T6 heat treatment in aerated 3.5% NaCl ambience. Microstructural and surface morphologies are determined by engaging XRD and SEM techniques.

Keywords Particulate-reinforced composites · Agro-reinforcement · Bamboo leaf ash particulates · Nickel surface deposition · T6 heat treatment · Corrosion

Introduction

According to the world estimates, India is the second-largest reservoir for bamboo cultivation. Bamboo utilization has paved way into all industrial, agro-sectors with diversified applications. The widespread usage of bamboo results in accumulation of higher amounts of bamboo leaf residual wastes which occupy majority of the landfills. The unrestricted and uncontrolled methods (especially burning) adopted for the disposal of bamboo leaf solid waste have some serious adverse effects on the environment. Under controlled burning conditions, bamboo leaf ash flaunts tremendous amounts of pozzolanic properties, i.e. higher traces of silica and aluminium. The higher reserves of siliceous and aluminous materials in bamboo leaf ash can be used as effective filler material during the fabrication of several eco-friendly, low-cost, low-weight, amply available composite material systems [1, 2]. Industrialists and research enthusiasts are employing novel ways to find replacements for the traditionally high-priced and scarcely accessible reinforcements [3–5]. In recent times, industrial agro-by-products such as rice husk ash, fly ash, coconut shell ash are found efficient in enhancing the material properties to a greater extent with minimized fabrication costs [6–11]. Therefore, the incorporation of bamboo leaf ash as reinforcement in various matrix systems will be minimizing the adverse effects on the environment by reducing the CO_2 emissions and minimizing the depletion of traditional high-cost reinforcements. Reinforcing the

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Research Article

Certain Class of Analytic Functions Connected with q-Analogue of the Bessel Function

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The focus of this article is the introduction of a new subclass of analytic functions involving q-analogue of the Bessel function and obtained coefficient inequities, growth and distortion properties, radii of close-to-convexity, and starlikeness, as well as convex linear combination. Furthermore, we discussed partial sums, convolution, and neighborhood properties for this defined class.

1. Introduction

Let A specify the category of analytic functions and η represent on the unit disc $\Delta = \{w: |w| < 1\}$ with normalization $\eta(0) = 0$ and $\eta'(0) = 1$ such that a function has the extension of the Taylor series on the origin in the form

$$\eta(w) = w + \sum_{v=2}^{\infty} a_v w^v. \tag{1}$$

Indicated by S, the subclass of A is composed of functions that are univalent in Δ.

Then, a $\eta(w)$ function of A is known as starlike and convex of order ϑ if it delights the pursing

$$\Re\left\{\frac{w\eta'(w)}{\eta(w)}\right\} > \vartheta, \quad w \in \Delta,$$
$$\Re\left\{1 + \frac{w\eta''(w)}{\eta'(w)}\right\} > \vartheta, \quad w \in \Delta, \tag{2}$$

for specific $\vartheta (0 \le \vartheta < 1)$, respectively, and we express by $S^*(\vartheta)$ and $K(\vartheta)$ the subclass of A, which is expressed by the aforesaid functions, respectively. Also, indicated by T, the subclass of A is made up of functions of this form

$$\eta(w) = w - \sum_{v=2}^{\infty} a_v w^v, \quad a_v \ge 0, w \in \Delta, \tag{3}$$

and let $T^*(\vartheta) = T \cap S^*(\vartheta), C(\vartheta) = T \cap K(\vartheta)$. There are interesting properties in the $T^*(\vartheta)$ and $C(\vartheta)$ classes which were thoroughly studied by Silverman [1] and Alessa et al. [2].

The intense devotion of scientists has recently fascinated the study of the q-calculus. The great focus in many fields of mathematics and physics is due to its benefits. In the analysis of many subclasses of analytic functions, the importance of the q-derivative operator D_q is very evident from its applications.

The concept of q-star functions was originally proposed by Ismail et al. [3] in the year 1990. However, in the sense of

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A decisive evaluation of series connected-hybrid modulated inverter for EV applications

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ABSTRACT

Acute Efficiency, extreme power density, prominent reliability is the primal factors for electric propulsion of the hybrid & electric vehicles. This work acquaints the reduced switch count based multilevel inverter operating under RV technique for electric vehicular applications with the use of PV energy source. Presently existing power inverter strategies for HEVs may prefer a DC-DC boost converter to attain the high voltage gain. The running EV inverters have low power density and more expensive and have low efficacy due to the need of bulky inductor eradicate the uneven ripples and current harmonics. A Decisive evaluation of Intended MLI boost Inverter is operating under optimal modulation based HPD, HPOD, HAPOD schemes, it have better features compare to other modulation schemes. The dynamic analysis of intended MLI with the efficient modulation scheme is implemented by Matlab/Simulink environment tool and simulation results are to be conferred.

Selection and peer-review under responsibility of the scientific committee of the International Conference on Newer Trends and Innovation in Mechanical Engineering: Materials Science.

1. Introduction

The automotive industry is rising very apace towards Electric Vehicular requisition; moreover these paradigm shifts presently make to smooth transition through electrical drive components. It is an ever-increasing crave for interfacing renewable energy sources especially for EV due to energy strait, renewable energy systems like photo-voltaic (PV) cell, wind energy sources, fuel cell (FC) sources are utilized in so many industrial applications related to automotive systems [1]. In that PV system are more popular due to vary with relates to requirement and interfaced to electric vehicle by using power conditioning units [2].

A centralised classical series connection of several panels is equipped to obtain DC-link voltage, by utilizing power semiconductor apparatus [3]. Conversion of low DC values into high DC link voltage with the help of extreme range of DC/DC converters and interfaced to drive system using DC/AC such as two-level converter topologies, but it is not required. Multi-level inverters have more expertise to attain high power range/voltage range applications. With the decrement of low dv/dt or di/dt ratio with less distorted outcomes and it may reduction of noise, EMI, need to reduce load side filter. The comprehensive design of MLI is to synthesize the nearby sinusoidal voltage by switching the consequent switches appear several voltage levels respect to switching actions [4]. Morely there are 3 types of multilevel strategies are as follows (Fig. 1);

- Series Connected type MLI Strategy.
- Flying Capacitor type MLI Strategy.
- Diode Clamped type MLI Strategy.

The analogy of FC type and DC type converters and series connected type MLI strategy have their better features due to ease plan and assemble to uniform structure of the converter. As above specified series connected type have more appearance due to no endowment of balancing capacitors &clamping diodes and this series connected converter compel the more number of DC input sources when the corresponding levels increases [5]. Here authors highlighted new converter strategy operated under RV technique with optimal hybrid modulation schemes. The imperative selection theme of the control action for this MLI strategy is conferring to minimize the THD values with respect to switching action. Number of voltage levels may increase the respective harmonized distortions also suppressed in outcome parameters with low switch count.

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COVID DISEASE DETECTION USING ReLU VARIANTS

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Abstract

Since long, the unexpected corona cases are being reported starting from Wuhan to all parts of the world. COVID-19 epidemic is spreading all over the world and became mysterious to track its root cause. The purpose of the research is to identify the highly affected areas and the cause for spreading the disease based on the current day statistics. The root cause of the disease is detected based on test reports and epidemiology is estimated using ReLU variants. This research is useful to the society or Government in analyzing the health status of Corona patients.

1. Introduction

Corona viruses cause illness ranging from cold to Middle East Respiratory Syndrome (MERS) and Severe Acute Respiratory Syndrome (SARS). The situation will be typical if the infection spreads across lungs. UK Research and Innovation identified seven types of corona viruses. They are

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Synthesis, Micro-structural and Vibrational Studies of Nb doped Lithium Titanate Anode Materials for Lithium-ion Batteries

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Abstract— This research work presents the outcomes of the impact of the fractional substitution of Nb^{5+} replacing Ti with $Li_4Ti_5O_{12}$ (LTO) anode material. For the original sample and the Nb substituted $Li_4Ti_{5-x}Nb_xO_{12}$ the fractional impact of Niobium on structural features have been presented in this paper. Well-crystallized spinel $Li_4Ti_{5-x}Nb_xO_{12}$ (x=0, 0.025, 0.05 and 0.075) anode materials are synthesized by ceramic method, which is calcined for 20 hours at 850 °C. An organized exhibition of the outcomes of the structural, morphological and vibrational bonding nature of the negative electrode materials are investigated via the XRD, FESEM, EDS and FTIR. The revealed peaks of diffraction are in complete synchronization with the ordered $Li_4Ti_5O_{12}$ spinel possessing Fd3m space symmetry. The grain sizes of Nb substituted materials are large above the base material ranging between 0.9 and 1.3 μm in diameter. The FT-IR spectra show MO_6 tetrahedra and octahedral to be a part of the oxide lattice, thereby confirming the spinel structure of the materials.

Keywords— *$Li_4Ti_5O_{12}$, XRD, FESEM, EDS, FT-IR*

I. Introduction

Batteries are attracting increasing attention as an energy solution. Batteries in portable electronics like cellular mobile phones and laptop/desktop computers are relatively mature technologically and reasonably priced for those applications. The Lithium-ion batteries (LIBs) are the most imperative elements of energy technology creating quite a bit of interest and have established themselves to be the most capable energy preserving appliances as a result of their unique advantageous features like high capacity, energy density, higher rate capability and relatively long life cycle in comparison to other batteries. The anode materials are important to estimate the performance and safety of LIBs. The conventional graphite based anode materials show a large volume change during the insertion/de-insertion process, which is considered as too high for battery applications, thus avoiding the safety issue present in carbon, since they operate at a potential (~ 0.1 V vs. Li/Li^+) close to metallic Li. Therefore, Li dendrites can thus be prevented [1-5].

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Magnetic and DC Electrical Resistivity Properties of Cu doped $Mg_{0.6-x}Ni_{0.4}Cu_xFe_2O_4$ Ferrite

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***Abstract*—** Cu doped $Mg_{0.6-x}Ni_{0.4}Cu_xFe_2O_4$ (x = 0.0, 0.1, 0.2 and 0.3) ferrite materials with spinel structure have been prepared by solid-state reaction method. For their characterization, we have used X-ray diffraction (XRD) to examine structural parameters, Scanning electron microscopy (SEM) with EDS to study morphology and composition, Fourier transform infrared spectroscopy (FTIR) to identify the characteristics absorption bands, Vibrating sample magnetometer (VSM) to deal with magnetic parameters, and Two-probe measurement technique for DC resistivity. The XRD pattern and two definite absorption bands given by FTIR in between 400 cm^{-1} - 600 cm^{-1} revealed a single-phase cubic spinel structure formation of the synthesized materials. The increment in Cu concentration increased the lattice constant as a result of the larger ionic radius of this substituent than that of Mg ion. The distribution of cations to the octahedral and tetrahedral positions affects the hopping mechanisms that ultimately influence the features related to resistivity and magnetism.

Keywords- Cu substitute Mg-Ni ferrite; X-ray diffraction; Vibrational Spectrometer; SEM; VSM.

I. INTRODUCTION

The Mg-Ni-Cu types of magnetic materials are widely used as photocatalyst [1-3]. They are permeable at high frequency, highly resistive, hard, stable, and available at low prices [4-8]. $NiFe_2O_4$ has a structure of the inverse spinel-type with ions belonging to Ni^{2+} located at the octahedral positions and ions of Fe^{3+} is located equally at both positions. Their magneto-optical and photo-catalytic properties can be tuned with Magnetic impurities like Co^{2+}, Mn^{2+}, etc. and non-magnetic impurities like Zn^{2+}, Cd^{2+}, etc. cations [9]. In this process, there is a redistribution of divalent and trivalent cations among the two sites [10]. For the desired particle size and shape in the sample, we have used a solid-state reaction method with urea as a reducing agent for the first time [11]. These types of ferrites are known to be efficient in the diverse field such as catalysis, sensors, magnetic memory preserving devices, magnetic resonance imaging, spintronics, liquid petroleum gas sensors, etc. due to their magnetic and semiconducting with n-type natures [12].

The effect of substituting Cu and Ni-ions on different physical properties of $MgFe_2O_4$ has been investigated. The sample is characterized with the help of XRD, SEM with EDS, FTIR, Two probe method, VSM, etc. for their structural, morphological, electrical, magnetic properties respectively.

II. EXPERIMENTAL DETAILS

Analytical grade chemicals were used to prepare the samples of Cu doped $Mg_{0.6-x}Ni_{0.4}Cu_xFe_2O_4$ for x = 0.0, 0.1, 0.2 and 0.3 through a solid-state reaction scheme. The MgO, NiO, CuO and Fe_2O_3 with proper stoichiometric ratio were ground for 6h in agate motor and pestle. The powder is then calcined at 900 °C for 4h and mixed with few drops of Polyvinyl Alcohol (PVA) as binder then pressed to a disk-shaped pellet

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Research Article

Orthogonal Stability and Nonstability of a Generalized Quartic Functional Equation in Quasi-β-Normed Spaces

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In this work, we examine the generalized Hyers-Ulam orthogonal stability of the quartic functional equation in quasi-β-normed spaces. Moreover, we prove that this functional equation is not stable in a special condition by a counterexample.

1. Introduction

In this paper, $\mathbb{R}$ and $\mathbb{C}$ denote sets of all real numbers and complex numbers, respectively.

In the fall of 1940, Ulam [1] suggested the stability problem of functional equations concerning the stability of group homomorphisms as follows:

Ulam's question: let $(G_1, *)$, $(G_2, *)$ be two groups and $d : G_2 \times G_2 \to [0,\infty)$ be a metric. Given $\delta > 0$, does there exist $\varepsilon > 0$ such that if a function $g : G_1 \to G_2$ satisfies the inequality

$$d[g(x * y), g(x) * g(y)] \leq \delta, \tag{1}$$

for all $x, y \in G_1$, then there is a homomorphism $h : G_1 \to G_2$ with

$$d(g(x), h(x)) \leq \varepsilon \text{ for all } x \in G_1? \tag{2}$$

In other words, under what condition does there exist a homomorphism near an approximate homomorphism? The concept of stability for functional equation arises when we replace the functional equation by an inequality which acts as a perturbation of the equation. In 1941, Hyers [2] gave the first affirmative answer to the question of Ulam for Banach spaces. This result was generalized by Aoki [3] for additive mappings.

During the past few years, several mathematicians have published on various generalizations and applications of generalized Hyers-Ulam stability to a number of functional equations and mappings (see, for instance, [4–15]).

In [16], Xu et al. obtained the general solution and investigated the Ulam stability problem for the quintic functional equation in quasi-β-normed spaces via fixed point method. This method is different from the direct method, initiated by Hyers in [2]. And also, Eskandani et al. [17, 18] obtained the general solution for the mixed additive and quadratic functional equation and a cubic functional equation and established its generalized Hyers-Ulam stability in quasi-β-normed spaces.

The Ulam-type stability result for the quartic functional equation

$$\begin{aligned} &F(x_1 + 2x_2) + F(x_1 - 2x_2) + 6F(x_1) \\ &\quad = 4[F(x_1 + x_2) + F(x_1 - x_2) + 6F(x_2)], \end{aligned} \tag{3}$$

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Building Time Series Prognostic Models to Analyze the Spread of COVID-19 Pandemic

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Abstract

The COVID-19 was officially confirmed as a pandemic by World Health Organization (WHO). It is an infectious disease that has been spreading swiftly across the globe, creating unprecedented lockdowns. This virus spreads among humans through small droplets from the nose or mouth of an infected person. In this 21st century with most advanced technology available, we are not able to control it. In this paper, we will study how the Time Series based Machine Learning (ML) techniques are useful for analyzing and predicting the Confirmed cases, Recovered cases and Deaths caused by COVID-19. We analyze the spread of COVID-19 and try to forecast the possible cases in the coming days using the datasets from John Hopkins University. We implement different Regression techniques, Time series forecasting technique like Auto ARIMA, Facebook Prophet Model to analyze on the rise and extent of the virus.

Keywords: *Auto ARIMA, Corona virus, COVID-19, Facebook Prophet, Linear Regression, Machine Learning, Polynomial regression, Time series*

1. Introduction

A pandemic is the worldwide spread of a new disease. The declaration of a pandemic is a reference to its spread, rather than its severity. With 118,000 cases of COVID-19 having been detected across 100 countries, the World Health Organization (WHO)on 11th March, 2020 declared it to be a pandemic. This virus is extending to others through respiratory droplets when adiseasedindividual coughs, sneezes or speaks. Persons can also be infected by touching a contaminated surface and then their eyes, mouth or nose. Maximum of the people who were affected by COVID-19 can get well and remove the virus from their bodies [1]. According to the confirmations so far, this Corona virus can be spread in all regions, comprisingregions with warm and moistclimate. Irrespective of environment, adopt defensive measure if you live in, or travel on area reporting COVID-19. The finestmethod to defend our self in contradiction of COVID-19 is by regularlywashing our hands. Remove viruses that may be on our hands and avoid infection that mighthappen by then touching your eyes, mouth and nose.This virus has initiated severe community health protection complications and later converted an international concern [2-4].

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Effect of Cr^{3+} substitution on dc electrical resistivity and magnetic properties of $Cu_{0.7}Co_{0.3}Fe_{2-x}Cr_xO_4$ ferrite nanoparticles prepared by sol-gel auto combustion method

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ABSTRACT

Using sol-gel auto combustion technique complex ferrite nanoparticles have been synthesized. Characterization with the help of X-ray diffraction (XRD) revealed that the synthesized materials $Cu_{0.7}Co_{0.3}Fe_{2-x}Cr_xO_4$ are of a single-phase cubic spinel structure with *Fd-3 m* space group. And also, the samples' crystallite sizes calculated using XRD data yielded in the range of 19.28–32.92 nm. The lattice constants are calculated to be between 8.4099 Å and 8.4441 Å. The FTIR results revealed that the spinel structure remained undisturbed even after the Cr ions were doped. FESEM images display the materials constitute polygonal-shaped grains though at times irregularly shaped joins with slight agglomeration appear. EDS analysis confirmed that the sample contained the constituent elements. A decreasing pattern in DC resistivity with an increase in temperature was observed, ensuring the semiconducting character of the ferrites under investigation. VSM was utilized to characterize and estimate the magnetic features like magnetic saturation and coercivity of the samples.

Introduction

In recent times, the study of substituted complex nano ferrite materials such as copper-cobalt has become the focus point in search of novel materials with high potential for controlled and desired magnetic and electrical properties for a tremendous impact on the application areas of sensors, biomedicine, information storage, electronic devices, catalysts, environmental remediation, microwave devices and spintronic devices [1–5]. Therefore, the homework and the challenges to the scientists and engineers will be to identify mechanisms that produce the desired physical properties (magnetic, electrical, optical, thermal, structural, and so forth properties) of materials at such cost-effective, simplest and accessible manners [6,7]. In general, the synthesis conditions, the chemical compositions significantly determine the properties of the magnetic oxide materials- the ferrites. The magnetization and polarization mechanisms, on the other hand, are not only related to optimizing chemical compositions but also processing conditions of these ferrites as well. Various classes of ferrites are usually associated with spinel oxide structures and are generally known as spinel ferrites [8,9]. The features related to ferrites depend on either their being in the bulk form or in nanoparticle sized forms which are mostly detected at the physical properties and surface effects.

To the magnetic behaviours, Neel postulated that ferrites exhibit the ferrimagnetism properties which originates from A-O-B superexchange interactions between tetrahedral (A) and octahedral (B) co-ordinated sublattices of these materials [10,11]. The substitution of different cations in ferrites will then have an impact on the magnetic properties at those sites as the substituent will have other magnetic moments. The additional weight percentage doping of Cr^{3+} ions having a magnetic moment of 3.8 μB leads to weakening of the A-O-B superexchange magnetic interactions along with the excellent tailoring of structural and magnetic properties in nano-sized Cobalt ferrites of the materials under

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Effect of Cu Substitution on Magnetic and DC Electrical Resistivity Properties of Ni-Zn Nano Ferrites

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Fashion compatibility using convolutional neural networks

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Sentiment analysis

ABSTRACT

The exponential growth in online shopping have increased the sales in apparel industry. The underlying secret is the online fashion recommendation system, which gives the customer various suggestions on the outfit selection during online shopping. These days fashionable outfit is the first wish and being able to choose from a wide variety of apparel and accessory combination is trending. The customers attain satisfaction by browsing through a variety of recommended outfits along with their associated accessories during online shopping. In this paper, we develop a fashion compatibility system that suggests the user with the outfit and its associated accessories for given input text like a fashion designer suggestion. We address the problem of generating fashion compatible outfits and accessories using Convolutional Neural Networks (CNN). The fashion compatibility system investigates for the simplest technique to recommend fashion compatible products that helps the retailers to understand the sentiment analysis of the customers in order to extend their digital marketing and customer satisfaction. We have compared different feature extraction techniques like bag of words, TDF-IDF, word2vec model. The model we have used to train the dataset is VGG-16.

Selection and peer-review under responsibility of the scientific committee of the Emerging Trends in Materials Science, Technology and Engineering.

1. Introduction

The advent of the internet in smart phone, online shopping, globalization, and fashion consciousness there is a huge demand for fashion compatibility [1]. The fashion industry has a major share in the economy of the world. We witnessed a steep increase in sales in the apparel industry with $3.3 billion each year from 2008 onwards whereas the global garments are $1.25 trillion in 2012. This huge increase in sales is due to the wide use of smart devices and online shopping. When a customer needs a business outfit, he inputs the text as business outfit along with the specifications like gender, size, style, fit, fabric, bag, shoes etc. It results in a quick list of suggested combination of outfits matching the customer criteria and requirements. We get a lot of options during online shopping when compared to in-store sales, where the salesperson cannot study customer behaviour and predict his requirement or choice. The word fashion states personality, behaviour, and the various attributes that aid in fashion, such as the fabric, cut, style, texture, size, comfort, etc. Often people look for fashion compatibility. That means the clothes which can be worn together along with their accessories like shoes, bags, scarves, etc. Fashion compatibility has been a topic of research interest for several years. In order to improve the user experience, many websites offer guidance in the selection of outfits based on their automatic recommendation system with user specifications as if the user wants an outfit for a business meeting. The recommendation system [2] gives some combinations of apparels along with their matching accessories as shown in Fig. 1.

The fashion industry has become the most popular these days. With a rapid increase in living standard of the society, the fashion awareness and fashion consciousness also grew across the business industry. Consumers get confused when selecting the best apparel from a set of apparel, which is time and energy-consuming activity. It is also difficult for merchants to master the real-time demand of consumers. Thus, leading to problem in supply chain management, as the merchants are unable to predict the customer demands. While in-store, the sales person too come across lot of issues like fashion, trendiness and customer taste. The sales person needs to be well trained on the stock availability and the customer choice to offer suggestion and make a quick

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An overview about influence of wick materials on heat and mass transfer in solar desalination systems

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Research Article

A Comparative Study on Crack-Healing Ability of Al_2O_3/SiC Structural Ceramic Composites Synthesized by Microwave Sintering and Conventional Electrical Sintering

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This study was conducted to assess and compare the crack-healing ability of conventional electrical sintered and microwave sintered Al_2O_3/x wt. % SiC (x = 5, 10, 15, and 20) structural ceramic composites. The crack-healing ability of both conventional electrical sintered and microwave sintered specimens was studied by introducing a crack of ~100 μm length by Vickers's indentation and conducting a heat treatment at 1200°C for dwell time of 1 h in air. The flexural or bending strength of sintered, cracked, and crack-healed specimens was determined by three-point bending test, and the phase variations by X-ray diffraction and SEM micrographs before and after crack-healing of both the sintering methods were studied and compared. The results show that almost all the specimens recovered their strength after crack-healing, but the strength of microwave sintered Al_2O_3/SiC structural ceramic composites has been shown to be better than that of conventional electrical sintered Al_2O_3/SiC structural ceramic composites. The microwave sintered crack-healed Al_2O_3/10 wt. % SiC specimen shows higher flexural strength of 794 MPa, which was 105% when compared with conventional electrical sintered Al_2O_3/10 wt. % SiC and crack-healed Al_2O_3/10 wt. % SiC specimen. It was found by X-ray diffractogram that before crack-healing, all the conventional electrical sintered samples have SiO_2 phase which reduce the crack-healing ability and microwave sintered samples with 15 and 20 wt. % SiC show lesser SiO_2 phase and 5 and 10 wt. % SiC samples have no SiO_2 phase before crack-healing. However, after crack-healing treatment, all the samples have distinct SiO_2 phase along with Al_2O_3 and SiC phases. Microwave sintered Al_2O_3/10 wt. % SiC specimen cracks were fully healed which was evident in SEM micrographs.

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Research Article

Investigation on Dielectric Properties of Press Board Coated with Epoxy Resin, Quartz, and Rice Husk Ash

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Epoxy resin mixed with rice husk ash and quartz powder increases its dielectric strength. This paper presents the dielectric properties of the press board coated with this epoxy mixture. In this work, the press board, which is used in the transformer, is coated with three components: epoxy resin, rice husk ash, and quartz powder. The nanometer-sized quartz powder and rice husk ash are mixed in the particular ratio with the epoxy resin. The mixture of epoxy resin, quartz powder, and rice husk ash is coated on both sides of the press board. The dielectric constant, volume resistivity, and Tan Delta (dissipation factor) of the coated press board are compared with the noncoated press board. The results reveal that the coated board is having high dielectric constant and volume resistivity when compared to the noncoated board.

1. Introduction

Insulators play a major role in electrical power transmission and distribution system. As the demand for electricity is increasing day by day, transmitting extrahigh voltage or ultrahigh voltage has become indispensable. So researchers are interested in doing many research studies with insulators. In the power system, three types of insulators commonly used are solids, liquids, and gases. Dielectric property and reliability are most important characteristics of any insulator. Introducing ecofriendly insulators or using naturally available materials along with the conventional insulator with increased dielectric strength has turned into a trend. In addition to the insulating property, the excellent mechanical and thermal properties are also required for an insulator for the consistent operation of electrical power apparatus [1–6].

Insulators are the one which are essential parts in high-voltage engineering and are used to separate live conductors from the earthed objects such as transmission towers in transmission system and transformer tanks in transformers. Along with the understanding of the design, consistency, and protection, the researcher must know about its physical and chemical properties because only these properties decide the dielectric property of the particular insulating material.

In high-voltage power apparatuses, epoxy resin is used extensively because of its exceptional insulating behavior towards electricity, extraordinary resistance to heat, and good mechanical properties. Nanoparticles-filled epoxy exhibits good properties when compared to the epoxy filled with micrometer filler. The epoxy material with SiO2 shows good dielectric properties when compared to the other fillers [7–10]. Silica obtained from the materials shows good

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Research Article

MHD Flow of Thermally Radiative Maxwell Fluid Past a Heated Stretching Sheet with Cattaneo–Christov Dual Diffusion

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This study explains the impression of MHD Maxwell fluid with the presence of thermal radiation on a heated surface. The heat and mass transmission analysis is carried out with the available of Cattaneo–Christov dual diffusion. The derived PDE equations are renovated into ODE equations with the use of similarity variables. HAM technique is implemented for finding the solution. The importance of physical parameters of fluid velocity, temperature, concentration, skin friction, and heat and mass transfer rates are illustrated in graphs. We found that the fluid velocity declines with the presence of the magnetic field parameter. On the contrary, the liquid temperature enhances by increasing the radiation parameter. In addition, the fluid velocity is low, and temperature and concentration are high in Maxwell fluid compared to the viscous liquid.

1. Introduction

Many industrial processes depend on fluids especially, non-Newtonian fluids. Few examples are plastic sheet extrusion, paper production, spinning of metals, glass fiber, etc. Maxwell is one of the non-Newtonian models, and he predicts the stress relaxation. The primary principle of MHD is that forces are produced in the fluid when the magnetic field induces a current through a moving conducting fluid. Magnetohydrodynamics has diverse engineering applications. Sandeep et al. [1] examined the stretching surface flows of Oldroyd-B, Jeffrey, and Maxwell fluids with non-uniform heat source/sink impacts along with radiation effects. They found that Oldroyd-B and Maxwell fluids have lesser effects compared to the Jeffrey fluid. Farooq et al. [2] analyzed the exponentially stretching sheet flow of a Maxwell-type nanomaterial. The Buongiorno model was used in this study to construct the physical model. Fetecau et al. [3] discussed the porous channel flow of the upper-convected Maxwell (UCM). Also, steady-state transient components have an appearance of oscillatory motion. Wang et al. [4] and Sun et al. [5] established the incompressible Maxwell fluid passed through a tube through a triangular cross section (rectangular or isosceles). Analytical approaches are implemented for steady-state solutions of two oscillatory motions. Few other studies about the Maxwell fluid types have been implemented by Qi and Xu [6], Wenchang et al. [7], and Qi and Liu [8].

Heat transfer is a natural phenomenon of heat owing between the object or within the object in the order of the temperature difference. This phenomenon has a wide application in enormous fields such as semiconductors, cooling devices, and power generation. In earlier days, heat transfer is characterized by the Fourier law of heat conduction [9]. However, this law fails to explain the heat transfer effect, and in nature, no material will satisfy this law. So, Catteneo [10]

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Corrosion Behaviour of Bamboo Leaf Ash-Reinforced Nickel Surface-Deposited Aluminium Metal Matrix Composites

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Abstract
The global consumption of bamboo leaves behind with greater amounts of waste leaves occupies a majority of landfills. Burning of this residual debris (bamboo leaves) in an unrestrained manner poses out multiple adverse and irreversible effects on both human and the environment we live in. A large number of residual wastes are being generated through industrial and agricultural operations due to the forever increasing world population. These residual debris is often involving much complicated processes for disposal. Converting the stubborn residual debris to green material systems is regarded as optimal and effective way for the current pollution crisis. The current study mainly intends for the use of calcined ash from bamboo waste leaves which have a tremendous pozzolanic properties and can be used as natural industrial-agro filler and inspecting the corrosion behaviour of nickel-deposited aluminium–bamboo leaf ash composites. The base A356.2 aluminium alloy is reinforced with bamboo leaf ash particulates by employing stir casting technique varying the reinforcement percentages, i.e. 2, 4 and 6 wt. %. The fabricated Al-BLA composites are nickel electrodeposited with a customary watt's bath. The corrosion behaviour of the test samples is investigated thoroughly by employing polarization tests under aerated 3.5% Nacl ambience. The microstructural and coating surface morphology is studied by employing SEM and XRD practices. It was noted the nickel-deposited Al-BLA composites flaunted enhanced corrosion resistance and elevated mechanical behaviour upon increasing the percentage of the reinforcement.

Keywords Aluminium metal matrix composites · Agro-reinforcement · Bamboo leaf ash · Corrosion · Nickel surface deposition

1 Introduction

The harsh and detrimental consequences caused due to the accumulation of industrial-agro waste products entice several research fanatics for exploring recent techniques for restraining environmental deterioration. Recently, researchers and industrialists are mostly focused on exploring industrial-agro by-products as an environmentally sound and efficient replacement for the high-cost, scarcely avail reinforcements [1, 2]. Although other reinforcements like SiC, Al_2O_3, B_4C, TiB_2, TiC, and graphite rendering enhanced mechanical, thermal, wear, and corrosion resistance are often limited their usage because of their higher toll in price due to their scarce availability and complicated manufacturing routes [3, 4]. Development of eco-friendly, low-cost, low weight are available aluminium matrix systems with exceptional mechanical behavioural traits have been researched intensively. Recent works include reinforcing the matrix core system with silica-enriched industrial and agricultural by-products like coconut shell ash, rice husk ash, red mud and bamboo leaf ash, which are found operational in replacing the conventional high-cost reinforcements [5–7]. Among all the low-cost agro reinforcements, bamboo is one of the fastest-growing, abundantly available, and highest yielding natural resources known to mankind since ages intended for numerous applications. According to world estimates, nearly 20 million tons of bamboo is been utilized for various applications. However, this would be creating the

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Synthesis, structural and antibacterial activity of pure, Fe doped, and glucose capped ZnO nanoparticles

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ABSTRACT

In this report, the structure, texture, and antibiotic nature of the synthesized ZnO nanoparticles have been studied using X-ray diffraction (XRD), Transmission electron microscope (TEM), and Fourier transform infrared spectroscopy (FTIR). The single wurtzite hexagonal crystal structure with their particle sizes in the 17–19 nm range was obtained. The particles were almost spherical. The octahedral peak from FTIR has been calculated at around 470–480 cm^{-1} while the tetrahedral sites at 616 cm^{-1}. The defect and antibiotic nature of ZnO is found to be correlated.

1. Introduction

Materials are more significantly applicable in nanoscale than their being in bulk due to the surface volume ratio. Their incompatibilities and other applications, such as technological devices, outweigh them than metals and chalcogenide nanoparticles [1]. A broader bandgap around 3.37 eV led it to be higher ability to produce electron-hole pair with a binding energy of 60 meV, even at average temperature, besides its thermally and chemically stabilities, readily available, cheap, less toxic, and easiness in preparation made ZnO a highly exploited material [2,3]. As a result, doped and undoped ZnO is widely used in electronics, photonics, optoelectronics, and bio-applications [4–6]. Some of them are solar cells, gas and liquid sensors, photodiodes, antibiotics, etc. [7,8]. The photocatalytic properties of ZnO make it an excellent antibacterial agent. However, the negative effect of nanoparticles on the positive role of bacteria is a major concern. Moreover, the dependency of size and composition on the nanoparticle's degree of negative impact is another subject of interest studied in Escherichia coli (E.coli) [9–11].

Its visible light absorption can be increased by doping with transition metals. This dopping reduces the bandgap by which the electron-hole recombination is checked and increases photocatalysis's spectral range. Here, iron has two oxidation states, +2 and +3, with ionic radii 0.61Å and 0.55Å, respectively used as a dopant for the Zinc lattice site as they have ionic radii smaller than that of Zn^{+2} (0.74Å). Thus, the dopping can be either substitutionally or interstitially for increasing the conductivity of the resultant. We can get the consequent material with different properties by doping different dopants. The dopants can be metal ions [12–25] or any other compounds [26–32]. Colloidal solution caping with an appropriate synthesis process [33] and formation of nanocomposites, heterostructures, and hybrid structures are possible by using suitable dopants [10–12]. The previously published research article explained in pure, iron-doped, and glucose-capped ZnO nanoparticles reported the drastic effects on their optical and luminescence properties, which drag our attention for further study on this composition [11].

In this work, pure, Fe doped, and glucose capped ZnO nanoparticles are produced by chemical precipitation and investigated their antibacterial natures.

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Article

Charge Transport through Functionalized Graphene Quantum Dots Embedded in a Polyaniline Matrix

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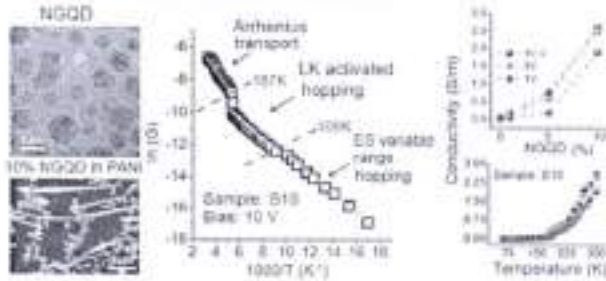
ABSTRACT: Nitrogen-functionalized graphene quantum dots embedded in a polyaniline matrix (NGQD−PANI) are extremely promising candidates for the development of next-generation sensors and for thermoelectric materials design with the distinct advantage of tunability of electronic properties by controlled doping and/or by controlling the inherent disorder in the microstructure. While their application is increasing in photovoltaics, energy storage, and sensing technologies, a clear understanding of conduction in these hybrid systems is lacking. Here, we report a comprehensive study of NGQD−PANI composites with varying NGQD doping levels over a wide range of temperature. We show distinct regimes of conduction as a function of temperature, which include: a transition from Efros−Shklovskii and Larkin−Khmelnitskii variable range hopping at low temperatures to thermally driven electron transport at higher temperatures. Importantly, we find a remarkable 50-fold enhancement in conductivity for 10% NGQD-doped samples and tunability of the crossover temperature between different regimes as a function of the applied voltage bias and doping. Our work provides a general framework to understand the interplay of extrinsic parameters like temperature and voltage bias with intrinsic material properties like doping, which drives the electronic properties in these hybrid systems of technological importance.



KEYWORDS: *graphene quantum dots, polyaniline, nanocomposite, electrical transport, variable range hopping, activated conduction*

INTRODUCTION

Electrical transport characteristics of graphene quantum dots (GQDs) represent remarkable characteristics including excited states in bilayer dots,[1] formation of gate-tuneable Andreev bound states in proximity to superconductors,[2] and periodic and nonperiodic Coulomb blockade peaks.[3,4] Most of these transport studies have been carried out on GQDs that are either grown epitaxially or transferred to some device architecture fabricated on SiO_2 or boron nitride substrates. While these studies are important for a fundamental understanding and for the development of GQD-based electronic devices, a parallel scalable approach for sensor and thermoelectric materials design is worthwhile as it utilizes the exotic properties of GQDs embedded in a matrix. This approach forms a bulk nanocomposite where the overall properties are controlled by the nanoscale constituents, the background matrix, and their interaction. Such systems offer conductivity tunability from an insulator to a metal by simply varying the doping and the inherent disorder in the microstructure and is often an advantage in applications such as thermoelectric devices.[5] Conducting polyaniline (PANI) offers an excellent choice as a matrix material because of the remarkable advantages it possesses—an extended π-conjugated system, optical transparency, processability, ease of the synthesis, an inexpensive monomer, and most importantly, easy tunability of the electrical property through doping.[6,7]

Consequently, GQD−PANI nanocomposite systems have attracted significant attention. Different types of GQD−PANI composites have been developed and investigated for their potential applications in sensing,[8,9] photovoltaics,[10−12] and energy-storage devices (supercapacitors and pseudocapacitors).[13,14] For these applications, a rigorous understanding of their transport properties is essential. A key ingredient in understanding the charge transport mechanism in these quasi-one-dimensional (1D) flexible and conducting polymers is to recognize the strong electron−lattice interactions.[15] Electrical conductivity of conjugated polymers is, therefore, understood in terms of coupled, self-localized, nonlinear excitations—solitons, polarons, and bipolarons.[16] A distinguishing feature of PANI from other conducting polymers is the lack of degenerate ground states. This means that the conventional

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Influence of Cr^{3+}-substituted $Co_{0.7}Cu_{0.3}Fe_{2-x}Cr_xO_4$ nanoferrite on structural, morphological, dc electrical resistivity and magnetic properties

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Abstract
The series of Cr-substituted Co–Cu nanoferrite materials have been developed having the chemical compositions $Co_{0.7}Cu_{0.3}Fe_{2-x}Cr_xO_4$, $x = 0.00$, 0.05, 0.10, 0.15, 0.20, and 0.25. These ferrite materials are prepared by using the solgel auto combustion method. These materials are characterized by XRD, FESEM with EDS, HRTEM, FTIR, dc resistivity, and VSM studies. Chromium is found to occupy the B-sites replacing Fe^{3+} ions. The density of all the materials is found to increase except at higher values of Cr concentration. The lattice parameter of Cr-substituted ferrites is found to increase with the rise of Cr content. The dc resistivity is decreasing with an increase in temperature and thus reveals the materials' semiconductor nature. VSM study was utilized to characterize and estimate the magnetic features like magnetic saturation and the samples' coercivity.

Keywords Co–Cu nanoferrite · Cr-doped · XRD · FTIR · Resistivity · Magnetic properties

1 Introduction

Technological advancements in spinel ferrites have huge commercial importance due to their desirable and keen magnetic and electrical properties [1–3]. The structural components of the tetrahedral (A-sites) and octahedral (B-sites) cationic interaction and preference have given such significant and impressive physical and chemical properties of these ceramic or sometimes called magnetic oxides—the so-called ferrites [4]. Among the various ferrites groups, the simple cobalt ferrites have received enormous attention due to their deterministic and conducive magnetic properties such as saturation magnetization, high coercivity, and high magnetocrystalline anisotropy for so many high-frequency electronic devices and cost-effective application along with their excellent chemical stability, mechanical hardness, remarkably high electrical resistivity, and large permeability [5–7]. Cobalt ferrites are very promising for magnetic resonance imaging (MRI), biomedical applications like targeted drug delivery, hyperthermia for cancer treatment, high-density information storage devices, magnetic fluids, and transformer cores humidity and gas sensors, etc., due to their excellent electromagnetic properties [8–11]. Chromium doped in this cobalt ferrite has been known to occupy this material's octahedral site, thereby imparting interesting properties that are potentially appropriate for certain applications [12, 13]. Thus, diving with more complex cationic interactions and enthusiasm over what happens, as a result, the substitution of chromium into copper-cobalt ferrites has been proposed in this study to modify their magnetic and electrical properties with the further intention of make them increasingly suitable for in one or more applications mentioned above.

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Evaluation of micro-structural and magnetic properties of nickel nano-ferrite and Mn^{2+} substituted nickel nano-ferrite

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ABSTRACT

The spinel ferrites have remarkable applications in electronic technology owing to their elevated saturation magnetization, steadiness, resistivity and little loss energy over a broad array of frequencies. The features with respect to structure and magnetism of manganese doped $NiFe_2O_4$ nano ferrite are extensively probed. The lattice parameter value and volume of unit cell rises with manganese substitution. The cation distribution indicates that the Ni^{2+} ions inhabit B-sites and Mn^{2+} ions dwell in tetrahedral A-spot and the Mn^{3+} ions swap Ni^{2+} from tetrahedral spot. The saturation magnetization and magnetic moment of the $NiFe_2O_4$ is lower than the manganese substituted ferrite. Spectra pertaining to electron spin resonance exhibit a lone signal wide enough showing the occurrence of Fe^{3+}, Ni^{2+} and Mn^{2+} ions with a 'g' approximately equal to 2.00.

1. Introduction

Of all the ferromagnetic materials, ferrites attract a lot of interest in the area of electronic technology owing to multiple utility in microwave to radio wave frequencies. The spinel ferrites which have a general formula AB_2O_4 constitute a mix of metal and oxygen. In these ferrites, cations are orderly scattered amongst tetrahedral and octahedral locations. Most familiar ferrites are of the cubic spinel class constituting tetrahedral (A-spot) and octahedral (B-spot) locations. The electrical and magnetic features of this class may possibly be effortlessly modified with apt sharing of extra cations in the spinel structure. Nano-crystalline ferrites have been an important theme of research, which exhibit exceptional properties, different from those of bulk ferrites. The nano-nickel ferrite ($NiFe_2O_4$) having their utility in diverse areas initiated interest to explore electric and magnetic features like elevated saturation magnetization, steadiness, resistivity and little loss energy over a large bandwidth. The substitution of a magnetic divalent transition metal ion like manganese is of interest in research due to its exceptional applications. The nickel and doped nickel ferrites are extensively put to use as magnetic materials owing to their larger resistivity to electricity and small loss with respect to dielectrics [1–3]. Particularly, Ni–Mn ferrites enact a crucial character among magnetic materials owing to their large resistivity, saturation magnetization and permeability. A number of researchers have shown ample interest on Ni–Mn ferrites as manganese substituting ferrites possess appealing magnetic and electrical features [4,5]. Various researchers have published that magnetization in Ni–Mn ferrites falls with rising manganese quantity and vice-versa [6–10]. The current research focuses on the manganese-doped nickel nano-ferrite produced by sol-gel auto combustion mode and its investigational analysis with respect to structural, magnetic and physical properties.

2. Synthesis and experimental techniques

The $Ni_{1-x}Mn_xFe_2O_4$ ($x = 0.0$ and 0.3) nano ferrites are manufactured through sol-gel auto-combustion technique. This technique can easily control the particle size, degree of agglomeration and chemical homogeneity. Analytical grade nickel nitrate ($Ni(NO_3)_2{\cdot}6H_2O$), ferric nitrate ($Fe(NO_3)_3{\cdot}9H_2O$), manganese nitrate $Mn(NO_3)_2$ and citric acid ($C_6H_8O_7$) have been roped in as initial ingredients for the purpose of production.

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TECHNICAL PAPER

Effect of welding current in TIG welding 304L steel on temperature distribution, microstructure and mechanical properties

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Abstract
In the current research work, austenitic stainless steel 304L of 1.4-mm thin sheet has been butt welded using TIG welding process. The influence of welding current in TIG welding of 304L stainless steel on temperature distribution, microstructure and mechanical properties of the welded joint has been investigated. The microstructure and mechanical properties of TIG welded specimens at varying welding current (20–120A) and constant welding speed and voltage have been explored. The influence of welding current on the weld zone temperature variation was investigated. The microstructures of the FZ, HAZ and base metal have been studied and compared at varying welding current. The mechanical properties such as micro-hardness, bending stress and tensile strength of the welded joints at varying welding current have also been investigated. The phases of the FZ were also studied by XRD analysis. Tensile test of welded specimens and parent metal has been carried out for measuring UTS and percentage elongation. Surface morphology for the fractured samples during tensile test has also been examined.

Keywords Temperature distribution · 304L · Micro-hardness · Welding current · Microstructure · XRD

List of symbols

T	Temperature (K)
ρ	Density (kg/mm^3)
v	Welding speed (mm/s)
c	Specific heat (J/kg k)
k	Thermal conductivity (W/mm k)
Q_t	Heat generated per unit volume (J/mm^3)
T_0	Room temperature (303 K)
ϵ	Emissivity (0.6)
σ	Stefan-Boltzmann constant
h	Natural convection heat coefficient
q_f	Fraction of the heat deposited in the front quadrant
q_r	Fraction of the heat deposited in the rear quadrant
b_f	Front ellipsoid parameter
b_r	Rear ellipsoid parameter
a	Width of the profile
b	Depth of the profile

Abbreviations

HAZ	Heat-affected zone
FZ	Fusion zone
XRD	X-ray diffraction
FESEM	Field emission scanning electron microscope
UTS	Ultimate tensile strength
TIG	Tungsten inert gas
BCC	Body-centered cubic
CFD	Computational fluid dynamics
APDL	ANSYS parametric design language
GTAW	Gas tungsten arc welding
DCEN	Direct current electrode negative
SMAW	Shield metal arc welding
MAG	Metal active gas
EDX	Energy-dispersive X-ray
FEM	Finite element method
ASTM	American Society for Testing and Materials

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Research articles

Micro-structural, dielectrical and magnetic properties of Cu^{2+} substituted $Ni_{0.7}Mn_{0.3-x}Cu_xFe_2O_4$ ($x = 0.0$, 0.05, 0.1, 0.15 and 0.2) nano-ferrites

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ABSTRACT

The nano-ferrites with chemical formula $Ni_{0.7}Mn_{0.3-x}Cu_xFe_2O_4$ having x between 0.0 and 0.2 were prepared by sol-gel auto-combustion process. The XRD pattern presents quite a good evidence for the formation of ferrite spinel phase in all the prepared samples. The broad lines indicate that the particles are of nano-size. The SEM studies reveal about the uniformity and crystallinity of the materials and also the spherical shape of the grains. Rise in copper density leads to fall in dielectric constant (ε_r) due to the relocation of Fe^{3+} from B-position to A-position. The dielectric loss (tan δ) maxima location swings towards the lower frequency as composition of dopant rises. The saturation magnetization and net magnetic moment decline with rise in Cu composition. The ESR technique ropes the subsistence of non collinear magnetic structure as predicted by VSM measurements.

1. Introduction

The ferrites are magnetic ceramic materials consisting of iron oxide and a metal oxide and known for their versatile applicability in radio to microwave frequency regions. They have low conductivity and the order of magnitude of the conductivity very much influences the dielectric and magnetic behavior [1–6]. The elevated electrical resistivity, small dielectric loss, high saturation magnetization, sensible permeability, moderate permittivity etc. are some of the noteworthy electrical and magnetic characteristics of ferrites. Due to their outstanding properties, they have potential applications for construction of several devices for example, magnets that last almost forever, memory preservation devices, microwave apparatus, and telecommunication equipment [7–11]. The microstructural, electrical and magnetic features of ferrites are based on various factors like process of synthesis, sintering atmosphere, sintering temperature, sintering time and chemical composition [12–16]. In this task, we successfully synthesized the spinel ferrites with general formula $Ni_{0.7}Mn_{0.3-x}Cu_xFe_2O_4$ ($x = 0.0$, 0.05, 0.1, 0.15 and 0.2) by substituting Mn^{2+} and Cu^{2+} in $NiFe_2O_4$ by using sol-gel auto-combustion route. The synthesized nano-ferrites are further investigated for their structural, electrical and magnetic features with respect to copper concentration.

2. Synthesis and experimental procedures

The $Ni_{0.7}Mn_{0.3-x}Cu_xFe_2O_4$ ($x = 0.0$, 0.05, 0.1, 0.15 and 0.2) nano-ferrites are manufactured by using sol-gel auto-combustion procedure. Aqueous solutions comprising of Ni, Mn, Fe, Cu, Fe nitrates are utilized to manufacture mixed oxide powders taking citric acid as the fuel agent. AR chemicals like $Ni(NO_3)_2{\cdot}6H_2O$, $Mn(NO_3)_2{\cdot}6H_2O$, $Cu(NO_3)_2{\cdot}3H_2O$ and $Fe(NO_3)_3{\cdot}9H_2O$ are used for the synthesis process. Citric acid ($C_6H_8O_7$) is assorted with each compound of the mixture pertaining to metal nitrates in 3:1 M ratio of tartaric acid to metallic cations. The solution of this assortment is altered into a gel phase via heating at 80 °C for 3 h. The prepared powder and pellets are sintered for 5 h at 1200 °C.

Formation of phase in the synthesized samples is established by the XRD patterns derived from PANanalytic X-pert Pro at ambient temperature, between 10° and 70° values of 2θ. The grain size is examined and morphological analysis is done utilizing SEM images extracted from JEOL JSM-6610L. The FT-IR spectra measurements are accomplished by

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Study of microstructure and mechanical properties of NiTi wire cladding on super austenitic stainless steel 904L by TIG cladding process

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Abstract. NiTi wire coating was preplaced on super austenitic stainless steel (904L) for enhancing the surface mechanical property. Melting of NiTi wire of 1 mm diameter formed a clad track on the 904L stainless steel substrate using the TIG cladding process. The influence of TIG current on microstructure, phase formation, micro-hardness and abrasive wear resistance characteristics of the clad surface have been investigated. The maximum average micro-hardness of the NiTi clad layer was 952HV at current of 40 A which is 5.95 times greater than the substrate material 904L. The EDS and XRD study of the NiTi coating layer confirmed the formation of NiTi, NiTi2, and B2 (NiTiFeCr) structure as major constituent phases and some intermetallic (Cr-Fe-Ni) which improved the mechanical properties of the clad layer. The pin on disc type sliding abrasive wear of the NiTi clad layer showed the improvement of wear resistance up to 8.83 times compared to the substrate 904L.

Keywords. NiTi wire; XRD; TIG cladding; 904L; abrasive wear; micro-hardness.

1. Introduction

Super austenitic stainless steels (904L) are extensively used in marine, petrochemical and nuclear applications due to its excellent strength and high corrosion resistance and better processibility. The component materials used in high speed machines undergo adverse unfavorable working conditions. The materials in manufacturing processing which are in continuous contact with each other undergo huge loss of energy and reduced component life due to continuous wear and corrosion. Surface modification by cladding process has gained attention of many tribologist to improve the surface property for wear and corrosion resistance applications. Stainless steels are prone to premature failure when exposed to cavitation attack stating that they have low cavitation erosion resistance [1]. With the presence of Mo, Cr, Ni and Mn, super austenitic stainless steel 904L exhibit specific properties of high corrosion resistance at moderate and high temperature. 904L has improved material properties like weldability and formability compared to other conventional stainless steels and nickel based super alloys. Super austenitic stainless steels (904L) are important as they bridge the gap between austenitic stainless steels and expensive nickel based super alloys when high corrosion resistant material property required at high elevated temperature [2]. NiTi alloy consist of Ni and Ti in equal ratio used in engineering and medical applications as they exhibit specific characteristics namely shapes memory effect, super-elasticity, high damping capacity, low stiffness, and high fatigue strength [3, 4]. They are biocompatible and used in medical implants and are widely used nuclear, mining, aviation and naval industries as they exhibit excellent corrosion and high wear resistance environmental sustainability [5]. The allurement of NiTi alloys have increased due to its outstanding characteristics namely shape memory effect and superelasticity. The market of NiTi alloy is incommensurate compared with its performance and properties. NiTi alloys are costly materials with poor machiniability when used as bulk [6].

The surface improvement plays a vital role in cost reduction and enhancing the surface material properties for specific applications of component materials. The advantage of the cladding process is to reduce the manufacturing cost as the making of new component parts is not needed. It also overcomes the scarcity of materials because less material is required to develop coating layers on bulk of substrate materials as the thickness of cladding layers is rarely few micrometers. The coating materials exhibit hard

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ORIGINAL ARTICLE

Investigation of TIG Cladding of NiTi Wire on Substrate 304L to Study the Effect of Applied Current on Microstructure and Mechanical Properties

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Abstract NiTi wire of 1 mm diameter was deposited on austenitic stainless steel (304L) for surface property modification using the tungsten inert gas (TIG) cladding process. The study shows that the microstructure and mechanical properties of the NiTi cladding are governed by TIG process parameters, namely TIG current. The microhardness of the NiTi clad region has improved 4.7 times compared to the substrate material 304L. The wear resistance of the clad layer against the abrasive disc (Al_2O_3) shows up to 6 times improvement than the substrate material austenitic stainless steel 304L. The presence of Ti-rich (Ni,Fe)Ti, NiTiFeCr and intermetallics, responsible for high hardness and high wear resistance, has been observed in the clad surface, which have been confirmed by the XRD and EDS analysis. The optical and FESEM micrographs of the clad, intermediate and substrate metals have been analysed, and the influence of TIG current on microstructure and mechanical properties has been investigated. With the improved significant results, NiTi clad specimens can be used as a cutting and grinding tool for industrial applications.

Keywords TIG cladding · Wear resistance · Micro-hardness · NiTi wire · Microstructure · 304L

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1 Introduction

Austenitic stainless steel (304L) is a widely used engineering material due to its high corrosion resistance, better processability and comparatively low cost. Materials made for high-speed machines experience detrimental working environmental condition. Stainless steels (304L) have great utility as engineering materials in wide area of applications, namely food processing industry, chemical industry and heat exchangers. The component materials, which are in continuous contact with each other during processing, have undergone loss of energy and reduced component life because of wear and tear and corrosion. The tribologists have gathered attention on surface cladding by surface modification of various engineering components for improving the surface to corrosion and wear resistance. Stainless steels have low cavitation erosion resistance and therefore are prone to premature failure when exposed to cavitation attack [1]. 304L has important properties such as high corrosion resistance, strength and ductility due to the presence of chromium and nickel. Cr improves corrosion resistance through the formation of CrO3 oxide on the surface of the steel which are adherent [2, 3].

Nickel titanium alloys are also named as Nitinol, which is a metal alloy made of nickel and titanium in which both the elements are found nearly in equal ratio. Nickel titanium alloys have gained popularity as it is a functional and structural material because of its specific characteristics, namely shapes memory effect and super-elasticity. Nitinol also exhibits high damping capacity, low stiffness and high fatigue strength characteristics. NiTi alloy has excellent corrosion resistance and high cavitation erosion resistance features with biocompatibility [4]. The presence of specific properties in NiTi alloy has made it one of the most suitable material resistances against corrosion and erosion

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Mathematical transmission analysis of SEIR tuberculosis disease model

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ABSTRACT

Tuberculosis is one of the burning issues of the modern era that causes serious health hazard in human body in last few decades. In this article, we proposed and analyzed the SEIR pandemic TB transmission model with time subordinate boundaries. We considered a compartmental TB mathematical model where the total population is ordered into four compartments as indicated by their natural highlights. We explored the effect of different phases of the compartments by analyzing the infection at free stability point along with basic reproduction, strength of the system and at endemic stability point. It is indicated that the TB model is locally as well as globally asymptotically stable at infection free stability point when the basic reproduction number is not as much as unity and novel endemic harmony when the basic reproduction number is more prominent than unanimity. A bifurcation investigation is performed by applying the bifurcation technique tools of the centre manifold theory. Mathematical conditions guarantee the event of forward bifurcation which has been inferred.

1. Introduction

TB (Tuberculosis) is infectious disease that actually underpins immense degrees of commonness across the universe. It is brought about by *Mycobacterium tuberculosis* and typically assaults the lungs (aspiratory tuberculosis). TB is most regularly communicated from an individual with irresistible pneumonic TB to others by bead cores, which are aerosolized by hacking, sniffling or talking. Different courses of transmission are unprecedented and of no epidemiologic essentialness. The likelihood of contact with an individual who has an irresistible type of TB, the closeness and span of that contact, the level of irresistibleness of the case, and the shared climate where in the contact happens are significant determinants of the probability of transmission [1,2]. TB microscopic organisms are constrained by the resistant system after contamination and the contamination becomes dynamic when the microbes spread wild, just individuals with dynamic TB can spread the infection. The more we convey this bacterium the more outlandish we are to create dynamic TB except if the invulnerable system turns out to be truly undermined by different infections. Be that as it may, TB has significantly affected population around the globe, particularly in spots where TB is more common. In addition, TB causes a bigger number of passing than some other irresistible infections [3].

1.1. Current status of TB in the world

Researchers [23,25] expounded on TB than some other infection in the nineteenth and mid twentieth hundreds of years when the infection was normal and infections were forefront science. This reached an unexpected conclusion during the 1950s with the presentation of anti-toxins and decrease in post-mortem examinations. Examination interest moved away from the morphologic pathology to new zones of immunology, atomic microbiology, and hereditary qualities that could be tended to with confined cells and creature models [6,10,and13,30-40, 42-44]. While new innovations encouraged already inconceivable

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RESEARCH ARTICLE

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A hybrid optimization based energy management between electric vehicle and electricity distribution system

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Summary

In this manuscript, a hybrid technique is proposed for energy management system (EMS) between electric vehicle (EV) and distribution system. The proposed hybrid system is joined execution of Fertile Field algorithm (FFA) and Gradient Boost decision tree (GBDT) hence it is named as FFA-GBDT technique. The main purpose of the proposed system is minimizing the cost of system, the power loss of the system with optimal energy management of the system. Besides, during the proposed FFA-GBDT based energy management development, this article investigates the cooperative assessment of EMS operation with various consideration such as bidirectional energy trading capabilities of EV fleet arrival time in EVs' driving plan, the PV uncertainty impact on EMS operation depends, the setting dissimilar prioritization factors effect on selling energy back to grid as resources on entire cost of system. The implementation of the proposed model is done at MATLAB/Simulink and execution is assessed using existing methods. Consequently, the outcomes illustrate that the proposed technique is effective for finding the near global optimum solution with less computation and reduces the complexity of the proposed algorithm. Thus, the simulation outcome indicates that effectiveness of the proposed technique and performance of the proposed strategy is compared to existing techniques. The energy consumption of proposed and existing techniques is also analyzed. The energy consumption of the proposed technique is 720.34 KJ.

KEYWORDS

electric vehicle, energy management system, energy trading capabilities, photovoltaic uncertainty

1 | INTRODUCTION

Recently, electric vehicles (EVs) have become extremely rapid and drawn much concentration, contributing to the improvement of electric vehicle charging stations (EVCS).[1,2] Obviously, the EVCSs are imperative for the energy internet rise, which offer excellent platforms for the interaction of energy between power grids and EVs.[3,4] Moreover, the EVs charging demands of EVs influence the temporal and spatial distribution of electric charges. Hence, it is essential for conducting the efficient management of energy among EVCSs, power grid, and EVs. Indeed, many have investigators have coordinated energy management among power grids and EVs.[5,6] The distribution system (DS) performs an imperative function for EVs integration, and their corresponding energy management through EVs.[7,8] For example,

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Study of Welding process parameter in TIG joining of Aluminum Aolly (6061)

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ABSTRACT

The present investigations aims to improve weld characteristics of Aluminum (Al-6001) plate using a pulsed TIG welding. The welding speed of the current study has been controlled by PUG machine coupled with TIG machine for automatic operation. The similar welding of the of Al-6001 plate have been performed by varying welding process parameters for full depth of penetration. Single side welding of Al-6001 plate has been studied. The influence of welding current & welding speed on the weld characteristics of the welded joint have been studied. The weld zone features have been analyzed with the microstructure images using Optical Microscopic and SEM (Scanning electron microscope) and on the other hand different phases have been characterized using XRD (X-ray diffraction) analysis. The hardness variation across the weld zone has also been quantified to study the change in mechanical property of the welded zone.

Selection and peer-review under responsibility of the scientific committee of the 3rd International Conference on Computational and Experimental Methods in Mechanical Engineering.

1. Introduction

Welding is a permanent joining phenomenon for joining many range of similar and dissimilar metals namely metals, alloys or plastics with the use of heat source and with or without pressure. During the joining process the faying pieces to be joined are melted with a heat source and solidified to form permanent joint having strength equal or greater than the parent metal. Welding may occur with or without the addition of filler material depending upon the metal sheet thickness to be welded and provide strong link between the welded joints. The weld ability of any material to be joined depends on mainly the metallurgical phenomenon occurring during the welding process which causes many changes in many material characteristics. Aluminium alloys are widely used preferred materials applicable in aerospace, spacecrafts, structural and military industries [1]. Aluminium alloys has specific properties namely greater elastic modulus, high specific strength, good fracture toughness, and excellent corrosion resistance. [2]. 6061 Aluminium alloys (6061) are heat treatable whose strength can be increased by precipitation hardening and also phase transformation occurs during heat input in welding. It is a precipitation-hardened Al- alloy which contains major alloying elements as magnesium and silicon. It was developed in 1935 and also named as Alloy 615 [3]. It exhibit good mechanical and weld ability properties and also most commonly alloys of alloys used for general applications.

Tungsten inert gas (TIG) welding is an arc joining method in which the faying metals are heated with an arc produced with a non-consumable electrode and parent metal during coalescence. TIG welding is the most widely used joining process for welding of Al-6061 alloys [4]. There are many methods in TIG joining process namely pulsing and magnetic arc oscillation. Many works have been performed in TIG welding for different aluminium alloys. Sanjeev Kumar et. al [5] studied the joining of thick plates (6 mm thickness) of aluminium alloys by pulsed TIG welding . They observed that the shear strength varies with pulse current and the presence of porosity in the weld zone. The shear strength for weld joint was found to be 73 MPa whereas for the parent metals as 85 MPa. Praveen et. al [6] investigated the automatic TIG welding of Al-5083 using a filler rod of Al-5356 with an objective to control the welding speed for good welded joint. They studied the

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Free vibration analysis of an orthotropic plate by dynamic stiffness method and Wittrick-Williams algorithm

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ABSTRACT

The Wittrick–Williams algorithm is used as the solution technique in the dynamic stiffness matrix to compute the natural frequencies of the orthotropic plate for different boundary conditions, aspect ratios, thickness ratios and modulus ratios. The corresponding dynamic stiffness matrix of the orthotropic plate is developed by classical plate theory and Hamilton's principle. Levy type boundary conditions are considered in this paper. Results obtained are compared with published results and that obtained by finite element method using commercial software Ansys.

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1. Introduction

The orthotropic rectangular plate plays an important role in the design of various components in the branches of engineering like mechanical, civil, aerospace etc. The reason of orthotropic behaviour of a material is due to the occurrence of constitutive relations by using which many composite plates can also be modelled analytically as orthotropic plates. Dynamic stiffness method (DSM) has been used by many researchers for free vibration analysis of plate. Wittrick-Williams [1] are probably the earliest investigators who formulate DSM for isotropic and anisotropic Levy- type plates about forty years ago. Danilovic et al. [2] developed DSM for rectangular mindlin plates. Ghorbel et al. [8] have formulated DSM for out of plane free vibration of rectangular orthotropic plate.

Various methods are reported in literature for finding the natural frequencies using DSM. The well known Wittrick–Williams algorithm [4] has been widely used and recognisably the best available solution technique at present. Boscolo and Banerjee [3] used Wittrick–Williams algorithm for finding natural frequencies for isotropic plates. Fazzolari et al. [9] developed DSM for anisotropic plates and used Wittrick–Williams algorithm as solver.

The novelty of this paper is application of the Wittrick–Williams algorithm to solve the dynamic stiffness matrix for finding the natural frequencies of orthotropic plate. In this work, the DSM has been formulated for Levy type orthotropic plate using classical plate theory (CPT). Different boundary conditions are considered, i.e. simply supported, clamped and free. The natural frequencies are obtained for different aspect ratios, thickness ratios and modulus ratios and are compared with those obtained by finite element method (FEM) using commercial software ANSYS. A good agreement is observed in the results.

2. Modelling procedure and numerical results

DSM has been employed for modelling the vibration response of plate. According to DSM, the dynamic stiffness matrix K for the plate element based on CPT is given by

$$[F] = [K]\{\delta\} \tag{1}$$

where $[K]$ is a 4×4 dynamic stiffness matrix which describe the effect on shear force and moment $[F]$ due to unit displacements $\{\delta\}$.

Dynamic stiffness matrix given by Eq. (1) is the key point to compute exact natural frequencies of levy type plates which are simply supported on two opposite sides. For obtaining the natural frequencies of a given orthotropic plate assembly, we used four number of plate elements. Each element of plate is connected through nodal lines. Since there are five nodal lines and the degree of freedom is two, therefore a 10×10 global master stiffness matrix was formulated from this. The assembly procedure used

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Use of backing mediums increase penetration during TIG welding of P91 steel

Akhilesh Kumar Singh ✉, Vidyut Dey & Pramod Kumar

Sādhanā 46, Article number: 203 (2021) | Cite this article

Abstract

Poor penetration in TIG welding was overcome by using backing plates. This study reports improved weld penetration, in 6.0 mm thick P91 plates, during TIG welding using backing plates of cast iron, copper, and mild steel. Bead-on-plate (BOP) TIG welding was carried out at the maximum heat input parameters based on earlier studies. In this study, the cast-iron backing plate gave the maximum penetration. It has been noticed that as the weld penetration increases, the grains in the heat-affected zone, get coarser and the average hardness decreases.

Wireless Personal Communications
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Wide Dual Band Asymmetrical I-Shape Rectangular Microstrip Patch Antenna for PCS/UMTS/WiMAX/IMT Applications

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Accepted: 9 August 2021

Abstract
In this paper, a wide dual band compact asymmetrical I-shape patch antenna has been designed and investigated. The proposed antenna is resonating at 2.14 GHz between 1.56 and 2.35 GHz in lower band while at 4.61 GHz between 3.29 and 4.96 GHz in higher band. The asymmetrical I-shape geometry of antenna is obtained by loading two notches of same size and two notches of different dimensions. The bandwidth of proposed antenna is obtained 40.4% (790 MHz) for lower band resonating with −21.77 dB return loss while 40.5% (1670 MHz) for higher band resonating with −51.07 dB return loss. A parametric investigation is also performed to observe the effect of notches parameter on return loss and resonating frequency. The gain of proposed antenna varies 2.8 dB at 3.5 dB in lower band while 3.1 dB to 5.9 dB in higher band. A good simulated antenna efficiency of 80% to 90% for lower band while 81% to 90% for higher band is also obtained. The lower frequency band 1.56 GHz to 2.35 GHz is suitable for PCS (1.85–1.99 GHz) and UMTS (1.92–2.17 GHz) while higher frequency band 3.29 GHz to 4.96 GHz covers WiMAX (3.4–3.69 GHz) and IMT (3.4–3.6 GHz) bands. Microstrip line fed antenna is designed and simulated by IE3D simulation software.

Keywords Dual band · Compact · I-shape · Bandwidth · IE3D

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Hybrid Common Control Channel Based MAC Protocol with Proactive Handoff Scheme in Cognitive Radio Network

Vivek Rajpoot ✉ & Vijay Shanker Tripathi

Wireless Personal Communications **122**, 3411–3432 (2022) | Cite this article

Abstract

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REVIEW ARTICLE

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Filtering antennas: A technical review

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Abstract

Filtering antennas or filtennas realize both antennas and filter functions in a single structure with the sole purpose of reducing losses and size in the design of a radio system. This article presents a comprehensive view of various filtennas design techniques and their types, satisfying the requirements of different wireless communication standards. The codesign and synthesis approaches and multilayer structure, slot/slit, and parasitic elements are the frequently used techniques reported in the literature to date for the filtennas design. The codesign and synthesis approaches need an extra filter in the filtenna's design, thus making it more complex. Whereas multilayer, slot, and parasitic elements do not require additional filters, and help the radio design become compact in size. The individual elements, that is, filter and antenna used in the filtenna are designed by cutting slots, stacking, resonators, or metamaterial structures. There are two broad categories of filtennas, namely, planar and nonplanar. Most of the papers covered in this article are planar, whereas, under the nonplanar category, horn filtennas are analyzed. Performance in each case is compared in terms of size, complexity, and cost. Considering filtennas frequency of operation, they are classified as a single band, multiband, ultra-wideband, and their MIMO configurations are analyzed to improve the reliability of the wireless radio system. Finally, various types of filtennas are compared, and the design guidelines are elaborated, mainly focusing on their application aspect to achieve more compact radio design solutions. The different techniques related to designing filtennas have been compared, and their glance details are provided for a more realistic assessment of individual techniques used till date. Thus, the authors believe that this review article presents a helpful guiding platform for researchers working on filtenna design.

KEYWORDS

antenna, band pass filter, filtenna, filtering antenna

1 | INTRODUCTION

The front end of the wireless radio system mainly consists antenna and filter. In the traditional design approach, these elements are separately designed and combined using a 50 Ω matching network.[1-3] However, this approach involved more losses and increase the size. There are several papers[4-10] reported to design filter and antenna together (i.e., filtenna) to reduce the losses and size in radio system design. These filtenna inherently

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Research Article

Seismic Fragility and Life Cycle Cost Analysis of Reinforced Concrete Structures with a Hybrid Damper

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The main objective of this research is to develop a hybrid damper by combining the friction damper (FD) and the X-shaped metallic damper (XMD) to enhance the performance of a building under seismic excitations with different peak ground accelerations (PGA). Four- and twelve-storey-reinforced concrete buildings were retrofitted with the hybrid damper, and seismic fragility, nonlinear dynamic, and life cycle cost analyses were executed on both structures to evaluate the performance of the hybrid damper and are compared with the FD and XMD of same yield load. According to the nonlinear dynamic analysis results, when a four-storey structure is installed with the XMD, FD, and hybrid dampers, the percentage of deduction of the average of the maximum interstorey drifts is 63, 67, and 74, respectively. When a twelve-storey structure is installed with the XMD, FD, and hybrid dampers, the percentage of deduction of the average of the maximum interstorey drifts is 59, 64, and 71, respectively. So the performance of the hybrid damper is superior to the XMD and FD in reducing interstorey drift of both structures. Results also show that the hybrid damper has enhanced the energy dissipation capacity compared to the XMD and FD under earthquakes with both low and high PGA values. According to fragility analysis results, the performance of the hybrid damper is superior to the XMD and FD in reducing the probability of attaining the collapse state. Life cycle cost analysis results show that structures with the hybrid damper acquired the shortest repair time and lowest repair cost.

1. Introduction

Many researchers are working on the earthquake-resistant systems to diminish the losses created by seismic excitations. Earthquake-resistant systems are categorized as passive energy dissipation system, active energy dissipation system, and base isolation. The passive energy dissipation system or dampers are well known when compared to the active energy dissipation system and base isolation due to their low cost. Among the dampers, friction and metallic dampers are widely used. Metallic dampers were used for the first time in the buildings by Skinner et al. [1] to dissipate the earthquake energy. Out of all the metallic dampers, the X-shaped metallic damper is popular and widely used because of its ease to manufacture. In order to improve the mechanical characteristics of this device, many researchers worked on this damper [2–5]. The friction damper was introduced by Pall and Marsh [6] and is popularly known as Pall friction damper. Later, Anagnostides et al. [7] developed the rotational and linear frictional dampers whose hysteresis loops were broad and stable. In order to further improve this device, many researchers worked on this damper [8–11]. But these dampers executed great performance only when subjected to the single source of earthquake excitation, which is either high or low PGA. To improve the energy dissipation capacity and to enhance the performance of a building under earthquake excitations with both high and low PGA, many of the investigators worked on using two

Review Article

A review on recent developments of sola stills to enhance productivity using nanoparticles and nano-PCM

Nagaraju V, G. Murali, Sankeerthana M & M. Murugan

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ABSTRACT

Employing phase change material (PCM) as a productivity-enriching medium in solar stills is the best source of storing the heat for a longer period in recent years. Few researchers incorporated the nanoparticles into PCM to examine the effect of nanoparticles on the productivity of a solar still. The current paper

ARTICLE

Excitation dependence and independence of photoluminescence in carbon dots and graphene quantum dots: Insights into the mechanism of emission

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Abstract. Excitation-dependent, multicolor emission from different varieties of 0D carbon systems have attracted immense research attention. It is generally accepted that some variants of 0D carbon exhibit excitation dependent emission, while other variants do not. A third variant exhibit both excitation dependent as well as excitation independent emission. In this work we investigate structure, composition, steady-state emission-excitation and photoluminescence decay dynamics of three distinctly different variants of 0D carbon – amorphous carbon dots (aCDs), graphene quantum dots (GQDs) and nitrogen-doped GQDs (NGQDs). We find that despite significant differences in structure and composition there is striking similarity in the excitation energy dependence of the emission characteristics of these three different dots. All of them exhibit excitation energy independent emission below some threshold wavelength (λ_{ex}), above which the emission becomes excitation dependent. We also demonstrate that a similar trend is apparent for nearly all variants of 0D carbon reported in literature. The threshold wavelength correlates well the excitation wavelength for most intense emission and the photoluminescence excitation peaks, suggesting a common origin of light emission in these carbon dots. The findings provide important clues for developing a unified general picture for understanding light emission mechanism in 0D carbon nanostructures.

A Introduction:

Following the serendipitous discovery of fluorescent fragments of single-walled carbon nanotubes in 2004,[1] quasi 0D carbon based nanostructures have drawn considerable research attention. Presently, different varieties of 0D carbonaceous structures constitute a family comprising of members, which are distinct and different from each other in terms of core structure and/or composition.[2-4] Some of the prominent members of this family are, graphene quantum dots (GQDs), carbon quantum dots (CQDs), graphene oxide dots (GODs), reduced GODs, (rGODs) polymers dots (PDs) and amorphous carbon dots (aCDs). It is easy to realize the structural and compositional variations of the different members from their nomenclature. For example, GQDs are small fragments of graphene which can have a variety of edge configurations or surface passivation and may be doped by different species. The GQDs are ideally made of sp^2 hybridized carbon only, while the CQDs are usually spherical and consist of sp^2 hybridized graphitic or turbostatic carbon along with fused diamond-like sp^3 carbon insertions.[5] On the other hand, the aCDs are clusters of carbon atoms bereft of any detectable crystalline structure. Some researchers have used 'carbon dot' (CD) as a generic term to define all the variants of quasi 0D carbon nanostructures,[6] whereas, others have differentiated CDs from GQDs.[7]

A number of reviews summarize different aspects of the findings reported so far. Starting from the early reviews by Baker and Baker,[8] Li et al.,[9] etc., to the recent ones by Yan et al.,[14] and Bhunia and Patra,[10] it is clear that room temperature fluorescence has always remained the most attractive feature of the 0D carbon nanostructures. Nearly all forms of quasi 0D carbon, prepared either by bottom-up or by top-down methods, exhibit room temperature photoluminescence (PL). However, till date there is no comprehensive understanding about the mechanism of luminescence.[11-15] Interestingly, irrespective of the structural and compositional differences, crystalline or amorphous character, some of the broad luminescence properties of the different varieties of 0D carbon nanostructures are reported to be similar in nearly all aspects of spectroscopic properties.[7,16] This has led many researchers to propose that molecular fluorophores synthesized at different stages of CD synthesis are actually responsible for PL emission, while the actual CDs or GQDs are either non-fluorescent or very weakly fluorescent.[17, 18] These fluorophores may be present either as free-floating molecules in solution or attached to the surface of the CDs or may be bonded with carbon core. However, these fluorophores (mainly, pyridine-based molecules) can only account for excitation independent PL emission.[19]

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Road extraction using Aerial images for future Navigation

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Highlights

- Smart Road extraction system using Image Processing.

SpringerLink

Original Paper | Published: 07 July 2021

Sensitivity analysis and prediction of erodibility of treated unsaturated soil modified with nanostructured fines of quarry dust using novel artificial neural network

Kennedy C. Onyelowe ✉, Tammineni Gnananandarao & Chidobere Nwa-David

Nanotechnology for Environmental Engineering 6, Article number: 37 (2021) | Cite this article

77 Accesses | 6 Citations | Metrics

Abstract

Sensitivity and error analyses and machine-based prediction have been conducted on the erodibility response of erodible unsaturated soil (degree of saturation 60%) treated with local cement and modified with nanostructured quarry fines. The machine-based exercise has

Structural and modulus spectroscopy studies of $Bi_{0.5}(Na_{0.8}K_{0.2})_{0.5}TiO_3$ nano-polycrystalline ceramic

Ch.K. Varada Rajulu ✉, S. Ramesh, T. Anil Babu, V. Raghavendra, D. Gangadharudu & K. Sambasiva Rao

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Abstract

Nano-polycrystalline $Bi_{0.5}(Na_{1-x}K_x)_{0.5}TiO_3$ ceramic with $x = 0.20$ (BNKT-2.0) was synthesized by using the solid-state mixed oxide method. We have taken the stoichiometric ratios using the formula $0.175Na_2CO_3 + 0.25Bi_2O_3 + 0.05K_2CO_3 + TiO_2 \rightarrow Bi_{0.5}(Na_{0.8}K_{0.2})_{0.5}TiO_3 + 0.25CO_2$. Densified BNKT-2.0 ceramic was obtained at the sintering temperature of 1163 °C for 2.30 h. The influence of K^+ ion substitution in BNT ceramic on structural and modulus properties was examined. XRD studies revealed a single-phase rhombohedral structure of the material with an average crystallite size of 56 nm. SEM analysis indicated polycrystalline spherical grains with the size of 1.37 µm. Modulus

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Electron beam Radiation Modification on Chemical, Thermal and Crystalline Properties of Poly (L-lactic acid)

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The paper presents the effect of electron beam (EB) irradiation on poly (L-Lactic acid) (PLLA). The resultant physicochemical properties were investigated using Electron spin resonance spectrometer (ESR), Fourier transform infrared spectrometer (FTIR), Differential scanning calorimetry (DSC), X-ray Diffraction (XRD) and Scanning electron microscopy (SEM). The results suggest that PLLA undergoes random chain scission producing two types of free radicals $-C(CH_3)-$ (I) and $CH(CH_3)-$ (II) at room temperature. Presence of these free radicals has been confirmed by the ESR method and computer simulation studies using *easyspin* tool. FTIR results depict that the intensity of the absorption band 1745 cm^{-1} is reduced by 12% for 90 kGy dose. DSC studies indicate that both glass transition temperature (T_g) and melting temperature (T_m) of PLLA decrease following radiation dose. However melting enthalpy (ΔH) and degree of crystallinity (X_c) increased initially up to 30 kGy of radiation dose followed by a decrease after 30 kGy. These results confirm the existence of two types of crystalline lamellar are present in PLLA. Measurements of X_c by XRD also confirm the same aspect. The surface of PLLA is composed of micro-cracks when exposed to higher radiation doses.

Keywords: Electron beam, Component spectra, Glass-Transition temperature, Degree of crystallinity, Micro-Cracks

1 Introduction

Bio-decomposable plastics have become alternative agents for petroleum based plastics due to their environmental friendliness. Poly (L-lactic acid) (PLLA) is one of such materials which is an aliphatic polyester made up of 2-hydroxy propionic acid building blocks. The PLLA is biodegradable due to its susceptibility to microbial enzyme degradation, hydrolytic degradation and biocompatibility derived from renewable sources like corn starch, tapioca roots and sugarcane[1]. PLLA has occupied second place in consumption of any bioplastics in the world. FDA has approved PLLA for clinical usage such as sutures, bone fixation device, tissue scaffolds and drug delivery systems[2]. Conventionally the uses of PLLA have confined to biomedical industry due to its bioresorbable properties, but recently the usage of PLLA has expanded its limits to consumer goods and packaging applications. The unique physicochemical properties of PLLA makes it a potential material for packaging applications in food and beverages[3]. PLLA is a good packing material with minimal greenhouse gas emissions and with environmental benefits[4]. Although PLLA is biodegradable, some of its properties like brittleness, high gas permeability, low heat distortion temperature and low melt viscosity restrict the applicability of neat PLLA while processing[5].

So to overcome such problems, the physicochemical properties of PLLA have to be modified by treating it with high energy radiations. The effects of radiation on biopolymers are well established and have been utilized to tailor the key properties of material for specific applications. Irradiation effects on PLLA were first investigated by Gupta *et al*[6] and reported the radiation chemical yield for chain scission and crosslinking of polymer. Thermal and hydrolytic of degradation of PLLA was investigated by several authors[7-9]. The degradation processes is characterized by reduction in molecular weight, change in structural configuration, lower thermal stability and loss of mechanical properties. Luo *et al*[10] have irradiated PLA and poly(lactic-co-glycolic acid) with EB in the dose range of 2.5-50 MGy. New crystalline phases were formed, degree of crystallinity (X_c) increased upon irradiation and also the authors have predicted the accurate manner to control rate of hydrolytic degradation for biomedical devices.

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Detection of copper by localized surface Plasmon resonance based fiber optic technique

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ABSTRACT

The present article discusses a cost effective technique for the detection and quantification of copper ion by using localized surface Plasmon resonance (LSPR) based fiber optic technique. For the purpose, a small portion of a plastic optical fiber is functionalized with gold nanoparticles which are modified with 4-mercapto benzoic acid (4-MBA). The proposed is very successful in the detection of Cu^{2+} even in trace levels (ppb) in a wide range of real time samples. The results are comparable with the existing detection techniques.

Keywords: Fiber sensors, Copper detection, Plastic fibers, Surface Plasmon resonance, metal ion detection, Plastic optical fibers, straight plastic fiber probes, LSPR

1. INTRODUCTION

During recent decades, the necessity for detection of selective heavy metal ions, such as Mercury (Hg), Cadmium (Cd), Arsenic (As), Chromium (Cr), Lead (Pb), Zinc (Zn) Copper (Cu) etc., has increased immensely due to growing environmental pollution. Upsurge of metal ion concentration above the permissible limit, would prompts carcinogenesis and other severe health problems [1-4]. Copper ion pollution is one of the major contributor of the overall metal ion pollution.

Plastic optical fiber is observed to be unique in absorbing Evanescent field sensitivity as well as less fragile. The sensitivity of the fiber can be further enhanced by functionalizing the fiber with gold (Au) nano particles which excites localize surface Plasmon resonance (LSPR) [5].

The present work is initiated for the detection of Copper (Cu^{2+}) using a chemical receptor 4-MBA (4-mercapto benzoic acid) tagged on gold nanoparticle (AuNP) functionalized etched plastic optical fiber. The sensing mechanism and experimental procedure are summarized in detail in following sections.

2. SENSING PRINCIPLE

As shown in figure1, the device consists of a decladded plastic optical fiber which is functionalized with gold nanoparticles (40nm size) tagged with 4-MBA (4-mercapto benzoic acid). Through one end of the probe, light gets transmitted and is detected at the other end of the probe. As the 4-MBA has high affinity towards Copper ions, when the probe is exposed to Copper ion solution, copper ions gets bind to MBA [6]. During the process of this reaction, plasmonic probe experiences

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Carcinogenic chromium (VI) sensing using swelling characteristics of hydrogel on Fiber Bragg grating

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Abstract

The present article proposes carcinogenic Chromium (VI) metal ion sensor by a hydrogel coated etched Fiber Bragg grating (FBG). Hydrogel synthesized from the blends of 3-arylamidopropyltrimethylammoniumchloride (ATAC) which is stimulus responsive to chromium ions suffers a volume change in different Cr solutions. Upon exposure to various concentrations of Cr (VI) ion solutions, FBG peak is shifted due to the mechanical strain induced by the stimulus swelling property of the hydrogel. The peak shift is correlated with the concentration of the Cr (VI) metal ion. Thus a Chemo-mechanical-optical sensing approach for the detection of Cr (VI) is studied. Trace amounts of Chromium (VI) ion as low as 10 ppb can be estimated by the method. The resolution of the sensor system is found to be 0.05 ppb.

Keywords: FBG sensor, Hydrogel, Cr sensing, Carcinogenic, Fiber sensors

I. Introduction

Last few decades, has been witnessing the substantial growth of Chromium (Cr) metal ions in terrestrial and aquatic ecosystems because of the escalating industrialization. Leather tanning, electroplating, steel production, pigment fabrication besides the natural causes such as erosion of soils, weathering of rocks are the main progenitors of Chromium metal ions [1,2]. World health organization (WHO) and he United States of Environmental Protection Agency (US EPA) have declared Chromium as one of the greatest threat to human race and listed as one of the top sixteen harmful metal ions and highly dangerous occupational carcinogen. Hexavalent chromium is highly active and when consumed, it can be easily and rapidly absorbed by different tissues and causes a damage of DNA and ultimately leading to detrimental impairment and the malignity of the cells and different types of cancers. [3-10].

Fiber optic sensors are one of the strong evocative alternatives for the alleviation of the draw backs associated with the present day techniques. One of the chief variant of fibers sensors are Fiber Bragg grating (FBG) based sensors. Though they are extensively used in field of telecommunications, their mushrooming applications in the fields of sensors technology cannot be denied. The spectral filtering property of FBG manifests it to be very sensitive to ambient temperature and applied strain. This property has fetched them many applications in various fields of sensing [11-16]. However, very less applications of FBG are found for chemical sensing as many chemical and bio chemical measurands works on refractive index variation. Recently, hydrogel coated FBG's become an emerging area of research. The unique behavior of hydrogels such as to swell or shrink in size in response to surrounding perturbations due to chemical or physical

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Multi U-bent Cladded POF Sensors for Refractive Index Measurement

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ABSTRACT

The cladded U-bent plastic optical fiber (POF) probes with single, triple and quintuple U-bent regions investigated under this study show a RI sensitivity of 2.7, 3.7 and 2.3 absorbance units/RI units respectively. The highest sensitivity obtained here is more than 50% of decladded single U-bent POF probes, however with superior chemical resistance.

Keywords: Fiber optic Sensors, Optical Sensing and Sensors, Remote Sensing, plastic fiber, POF Sensors, U-bent fibers, Refractive index, low cost.

1. INTRODUCTION

Identification of precise refractive index (RI) changes, is an important concern in various fields such as petroleum industries, food processing, pharmacy applications, clinical diagnostics etc. Conventional RI measuring instruments suffer from limitations due to their voluminous size, inefficiency for remote monitoring and high cost [1]. Plastic optical fiber (POF) based RI sensors have recently gained attention due to their innate properties such as ease in handling, flexibility, high facture toughness, negative thermo-optic coefficient and high sensitivity to strain. Apart from that they offer excellent compatibility to organic materials, enabling them for chemical and biomedical applications [2]. Evanescent field absorption based POF sensors could be low cost and reliable alternatives for RI measurement. Various fiber sensors such as straight decladded fiber, biconically tapered, D-shaped, micro bent, laterally polished etc. were reported for the measurement of RI. Among all these configurations, U-bent POF sensors offer advantages such as robustness, high sensitivity, ease in fabrication and adoptability for point sensing [3, 4]. However, the resistance of decladded POF (PMMA fiber core) to harsh chemicals such as acids and organic solvents including alcohols is poor. Since the fiber with fluorinated polymer cladding over PMMA fiber core offers better chemical resistance. U-bent probes with their cladding intact can be an alternative. However, presence of cladding restricts the evanescent wave penetration into medium. This problem may be circumvented by introducing multiple turns to improve their RI sensitivity. In the present study, three U-bent probe configurations each with single, triple and quintuple U-bent sensing regions, one turn U-bent and two turn U-bent POF probes are realized and their sensitivities are compared.

2. EXPERIMENTAL

Sensor probes of bent radius 1mm were made using 0.5 mm POF (core diameter is 480 µm and cladding thickness is 20 µm) by winding the POF on a flat iron rod of 5 mm width and 2 mm thickness and firmly pasted with tape. The legs of the probes are inserted into suitable glass capillary tube and exposed to 100°C by placing it in hot air oven for ten minutes. The three U-bent POF probe configurations are as shown in Fig. 1. Green LED (at 530 nm) used as

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Monitoring of pH by using stimulus responsive hydrogel and Fiber Bragg grating for bioreactor application

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Abstract

In this paper a pH monitoring system is demonstrated by utilizing wavelength modulated fiber optic techniques. A stimulus responsive hydrogel which exhibits a volume change with the change of pH is utilized to render a strain on Fiber Bragg grating (FBG). The gel is synthesized from the blends of Poly (vinyl alcohol)/Poly (acrylic acid). The induced strain causes a FBG peak shift that can be used as a measure of pH change. The proposed sensing system exhibits a good linearity in acidic pH range of 3 to 7 with a sensitivity of 250 pm/pH. Besides that it is very cost effective, bio degradable and also possess repeatability.

Keywords: FBG sensor, Hydrogel, pH sensing, Bio reactor, Fiber sensors

1 Introduction

Monitoring of continuous changes in pH of water is a very factor in many fields like sea water analysis, drinking water management, waste water analysis, blood analysis [1]. Though many pH sensors are available, they are suffering from some serious disadvantages such as voluminous size, inability for remote monitoring, high cost, electromagnetic interferences and slow response times make them vulnerable in many applications. Optical fiber based sensors can provide an alternative ways to address these problems.

With the inception of Fiber Bragg grating (FBG) for telecommunication as a spectral filter, novel sensing applications of FBG are also found in various fields of research. Physical measurand's such as pressure, temperature, strain, humidity, refractive index, vibration have been successfully sensed by utilizing the FBG as a main element [2-4]. By modifying FBG surface with stimulus responsive coatings, chemical applications can be demonstrated. The study on hydrogel coated FBG sensors is an emerging area of research in which stimulus responsive property of hydrogels causes a swelling or contraction of the gel which in turn causes wavelength shift of FBG peak.

Stimulus responsive hydrogels or polymers exhibit a significant change in terms of volume like swelling or shrinking in size in response to ambient physical and chemical changes such as pH, electric and magnetic fields, light, salt concentrations, and specific ions. [5, 6].

In this paper a pH monitoring system is demonstrated by utilizing wavelength modulated fiber optic techniques. A stimulus responsive hydrogel, which exhibits a volume change with the change of pH, is utilized to render a strain on Fiber Bragg grating (FBG). The gel is synthesized from the blends of Poly (vinyl alcohol)/Poly (acrylic acid). The induced strain causes a FBG peak shift that can be

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Performance evaluation of square pyramid solar still with various vertical wick materials – An Experimental approach

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ABSTRACT

The demand for fresh water is increasing rapidly, but its supply has been typically decreasing over the past decades. The scarcity of drinking water can be resolved through the desalination of seawater. The present study deals with analysing the performance of a square pyramid solar still (SPSS) in the presence of various vertical wick materials by experimentally. To increase the distillate productivity of the conventional SPSS, various types of wick materials were placed vertically in the water basin. Initially, the experiments were conducted for different basin water depths (2, 3, 4, 5, and 6 cm) to calculate the effective basin water depth. The results indicated that the water depth was 2 cm, which provided 14.4%, 23.1%, 31.3%, and 39.6% higher productivity than 3, 4, 5, and 6 cm basin water depths, respectively. In addition, experiments were conducted for various wick materials, like polyester, terry cotton, jute cloth, and woollen fabric, to enhance SPSS productivity at 2 cm basin water depth. The evaporation rate increased due to the capillary action of the wick material. The experimental results proved that the SPSS productivity was 9.4%, 20.9%, and 33.1% higher by using woollen fabrics than of jute, terry cotton and polyester, respectively.

Keywords: solar still, square pyramid, vertical wick, water depth, evaporation rate.

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An experimental investigation on effect of durability on strength properties of M40 grade concrete with partial replacement of sand with copper slag

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ABSTRACT

Sustained population boom and speedy industrialization have led to an enlarge in housing demand. Due to the environmental impact, the use of herbal sand for concrete manufacturing is limited. The scarcity of mortar and concrete for the manufacturing of high-quality aggregates has been decided due to the partial replacement of gravel with copper slag. Research article reviews some experimental studies on the impact of copper slag partly replacing sand on concrete performance. In this paper, an experimental work was once carried out to look into the impact of copper slag as a fine combination on the residences of concrete. Copper slag is a byproduct of copper production, which incorporates giant quantities of iron oxide and silicate and is chemically stable. In this study, an experimental work was carried out on M40 concrete for the complete study. Several concrete specimens had been made by changing the satisfactory combination with copper slag with special proportions varying from 0% to 100% with an interval of 20% (0%, 20%, 40%, 60%, 80%, and 100%). On the hardened concrete specimens, the action of acids like (H_2SO_4 & HCl) and the Sulphate attack like (Na_2SO_4, $MgSO_4$) are acted on the hardened concrete specimens and the weight loss and the variant in the compression strength used to be determined. Based on the check results, the best proportion of usage of copper slag for fine aggregate in the concrete is optimized and the consequences received are compared with the replaced concrete specimens made with ordinary Portland cement and sand and the version between the compression results and the version in the weight of the concrete specimens before and after acid and Sulphate attacks are shown. Test effects exhibit that it is practicable to use copper slag as a satisfactory aggregate in concrete.

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1. Introduction

The usage of modern waste or optional substances advances the production of concrete and cement in the improvement division. Different businesses are creating new results and waste. Dumping of waste can cause natural issues. Thusly, reuse of waste is a huge practicable for the solid assembling. For a long time, side-effects, for example, fly debris, silica smoke, and slag have been viewed as waste. Matrix prepared by this texture proposes expanded operability and durability as opposed to ordinary cement can be utilized for the development of electric controlled force, synthetic vegetation and submerged structures. In the existing decennaries, inside and out turn upward has been outfitted to find every single possible procedure for utilization. Copper slag is acquired from the scrap business. Direct an overview to investigate the open door copper slag as an option for sand in a solid blend. In present day circumstance, vehicle emanations and sand extraction have become a dominating test because of ecological dangers and genuine awkward nature in the biological system. Some examination has been completed to confine the genuine affect the earth, the utilization of results, for example, copper slag as a fractional option for impeccable totals. There is a number encounters in using copper slag asa development of current totals. It is a result of the

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Microstructural, impedance and conductivity studies of magnesium doped lithium titanate materials for Li-ion batteries

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ABSTRACT

In this research, we present the results on the effect of the partial doping of divalent Mg2 + in the place of monovalent Li + in LTO (lithium titanate, Li4Ti5O12) material. For the mother compound as well as Mg doped with the formula Li4-xMgxTi5O12 (x = 0 and 0.05), the partial influence of magnesium on structural, impedance and conductivity properties have been investigated. A systematic presentation of the results of the structural and electrical properties of the anode materials are studied through TG/DTG, XRD, FESEM with EDS and LCR. The observed diffraction peaks are in full agreement with the ordered LTO spinel structure belonging to the Fd-3 m space group. The doped material is quite large with grain size upto above 1.1 μm in diameter and also has a wide distribution range. The impedance properties of the Li4-xMgxTi5O12 (X = 0, 0.05) anode materials are studied in the temperature ranging from room temperature to 120 °C and frequency ranging from 20 Hz to 1 MHz by employing complex impedance spectroscopy (CIS). The conductivity studies reveal that the Mg doped material Li3.95 Mg0.05Ti5O12 exhibits highest electrical conductivity of 3.03×10^{-5} S/cm.

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1. Introduction

The rechargeable Li-ion batteries (LIBs) are the most important parts of energy technology attracting lots of attention and have proven to be the most promising energy storage and energy conversion devices in the present days. One of the key components of the LIBs is the anode material, which determines the life cycle of the battery and cell capacity [1–3]. Presently used Graphite and its based materials have significant safety related problems of dendritic Li growth due to its lower lithiation potential (almost to 0 V vs. Li/Li +). The conventional graphite anode materials show ~ 10% volume change which is considered far too higher for battery applications [4,5].

The cubic spinel LTO (lithium titanate, Li4Ti5O12) anode material has many advantages over conventional graphite because of it having an extremely flat insertion/de-insertion curves at ~ 1.56 V, good cycling stability and almost zero volume insertion nature [6–8]. Mostly, LTO materials are prepared by ceramic process that involves mechanical mixing of oxides and carbonates, calcined at higher temperature (700–1000) °C and sol–gel preparation techniques [9–11]. Besides, the LTO anode material is electrically an insulator having low electric conductivity (10–13 $S.cm^{-1}$), which is the primary limitation of the LTO anode material [12]. To overcome the disadvantage of conductivity of LTO anode material, transition metals such as Mg, Zn, Cu Ca, Ni, Co, Cr, La, V, Ru, Zr, Sn and Nb in Li and Ti sites can be used as dopants. As Mg is inexpensive and is predicted to help in stabilizing the structure, it has been considered as a substitute for Li [13–15]. The substitution of divalent Mg2 + for monovalent Li + in the structure necessitates that the difference in charge must be compensated by a reduction of an equivalent number of Ti cations.

From Ti4 + to Ti3 + . Then the results showed increase in the electronic conductivity of LTO and also showed a higher electrochemical performance than that of the basic LTO anode material [16–19]. Magnesium is chosen for doping because it does not affect or change the lattice of lithium and titanium (Li4-xMgxTi5O12) by

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Synthesis, characterization and electrical studies of Nb-Substituted $Li_4Ti_5O_{12}$ anode materials for Li-ion batteries

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ABSTRACT

Niobium doped LTO (Li4-xTi5-xNbxO12, X = 0 and 0.05) was synthesized from the solid- state reaction route calcined at 850 °C for 16 h. The effect of doping on the crystal structure and morphology was investigated. It concluded that Nb5 + ions do not change the cubic spinel nature of the Li4Ti5O12. The morphological features of the powder materials are in the range of 1–1.2 μm. The FTIR spectra shows that the oxide lattice structure comprises of MO6 (M = Li, Ti, Nb) tetrahedra and octahedra confirm the presence of structure of the spinel class. The electrical data dependent on frequency were used to study the conductivity mechanism. However, the Nb0.05LTO seems to be stable and maintain higher electronic conductivity than pure LTO at ambient temperature.

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1. Introduction

Li-ion battery (LIB) technology currently plays a vital role in producing alternative energy storage devices, because of its essential outstanding characteristics. The structure of a battery includes a cathode, anode, electrolyte, and the separator. The anode is the source of Li-ions and the cathode acts as a sink for the Li-ions. Spinel $Li_4Ti_5O_{12}$ (LTO) has been considered as promising negative electrode material in LIBs [1]. Earlier studies have shown that Sn-, Sb- and Si- etc substituted materials; different transition metal oxides and spinel LTO are some of the suitable anode materials. The LTO material is also recognized as "zero-strain" as the insertion/extraction of Li^+ has negligible influence on the structure. But its disadvantage of low electronic conductivity limits its application to spread wide [2,3]. In order to improve the rate capability of LTO anode material substitution or doping method is considered to be an easy method to increase the electronic conductivity and electrochemical excellent rate-capability of LTO. To overcome the disadvantage of conductivity of LTO anode material, transition metals such as Mg, Ca, Cu, Zn, Co, Cr, La, V, Sn and Nb in Li and Ti sites can be used as substitution [4,5]. As per the literature study of the Nb doped in LTO materials, especially Nb composition (0.05) doped LTO material exhibits good conductivity and electrochemical performance. This is the main reason we chose this particular composition of Nb is 0.05 [6–9]. The aim of this research includes mitigating the effect of the partial substitution of Nb^{5+} substitution in place of Li and Ti in LTO anode material, ensuring material stability.

2. Synthesis and experimental procedures

The sample compositions are set up by solid state-reaction technique from stoichiometric ratios of Li_2CO_3 (Sigma Aldrich 99.9%), TiO_2 (Sigma Aldrich 99.9%) and Nb_2O_5, (Merck, 99.9%) taken as the raw materials. We take raw materials of 15 gms for each sample preparation. First, the raw materials are thoroughly mixed using agate mortar using absolute methanol as a solvent for 6 h. The materials are annealed in the air for 16 h at 850 °C and prepared pellets are sintered at 900 for 16 h using a muffle box furnace to dry the compounds and make them free from unwanted gases. After polishing the top surfaces of these pellets, acetone is used to wash them. To make the opposite faces of the sintered pellets act as electrodes silver paste is coated on them. Pellets with

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Enhanced Reliable Trust Management Framework for Mobile Ad-hoc Networks

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ABSTRACT:

As a fascinating and geographic research topic in current years, researchers are adopting the block chain technology in mobile ad-hoc networks. Block chain technology can used not only for security data storage for critical data and also a platform for that facilities the trustless exchange of data between two parties. Mainly block chain technology used in mobile ad-hoc network is which kind of nodes be involved in the validation process and maintaining the genuine characteristics [1] [2]. In this paper we have proposed block chain based trust management system for mobile ad-hoc networks. The proposed system provides the distributed trust framework for routing nodes in mobile ad-hoc networks that is tamper proof. Block chain technology solves all the security issues in distributed and trusted platform. The proposed block chain technology is reduces the attack detection overhead and time is also decreases. It is possible to design the high scalable and distributed trust mobile ad-hoc network among routing nodes [2] [3].

Keywords: Mobile Ad-hoc networks, Block chain technology, security data storage, recommendation system, trust and reputation management system.

I.INTRODUCTION:

Recommendation is frequently used as a way to measure trust or reputation. Recommendation is simply an attempt at communicating a party's reputation from one community context to another. Trust management is a legislative immunity of risk management with particular emphasis on authentication of entities under uncertainty and decision making on cooperation with unknown entities. Trust management comprise trust establishment, suitable trust evidences, trust update and trust revocation. This paper major objective is designing the efficient trust management methodologies to evaluate the trust.

Generally trust operations are limited to local access, which introduces the problems of incompleteness vagueness. Hence it is critical to reconfigure the networks seamlessly and consistently. In this paper we have proposed block chain based trust establishment system that provides distributed, consistent, and tamper proof trust to nodes in mobile ad-hoc networks. Block chain technology is providing the potential solutions for trust management. Block chain technology is implementing the proof of work and proof of trust concepts. These

Cadmium substitution effect on structural, electrical and magnetic properties of Ni–Zn nanoferrites

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Optical and luminescence properties of pure, iron-doped, and glucose capped ZnO nanoparticles

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ABSTRACT

Pure, iron-doped, and glucose capped ZnO nanoparticles (NPs) have been synthesized by a chemical precipitation method. The structural, optical, and photoluminescence properties of all the prepared samples are examined systematically. X-ray diffraction patterns of all the samples exhibited a single hexagonal wurtzite structure with an average crystallite size ranging from 1.01 to 1.78 nm. Transmission electron microscope images showed the spherical shaped NPs in the range of between 17 and 19 nm. Fourier transform of infrared spectroscopy (FTIR) studies confirmed the presence of octahedral sites around 470–489 cm^{-1} and tetrahedral sites at 616 cm^{-1} in pristine and doped samples. The calculated optical bandgap energy for pure, Fe doped and glucose capped ZnO NPs are found to be 3.82, 3.80, and 3.63 eV, respectively, and the variations in the bandgap is ascribed to the Fermi level, which is in the conduction band resulting in the absorption edge shifting towards the higher/ lower energy. It is observed that Fe doped and glucose capped ZnO NPs showed a strong photoluminescence signal than the pure ZnO NPs. The green emission is quenched. The blue emission is enhanced due to the deactivation of oxygen vacancies on the surfaces due to the smaller particle sizes as a result of the quantum confinement effect.

Introduction

ZnO particles show significant changes in their properties like photocatalytic activity and optoelectronic properties, etc., at the nanoscale, when they are doped with suitable elements [1]. ZnO nanoparticles (NPs) have semiconducting nature with a wide bandgap of 3.37 eV, and they can produce electron-hole pairs even at room temperature. These characteristics contribute to their optical and photoelectrical properties [2]. They are also thermally, and chemically stable, readily available, cheap, less toxic and can be prepared easily [3,4]. As a result, ZnO NPs are widely used in medical, electronics, photonics, and optoelectronic applications like biogas and liquid sensors, molecular detection light-emitting diodes (LEDs) [5–7]. They are also appropriate materials for photovoltaic applications [8–10]. When ZnO is grown on another substrate like Al_2O_3, a skinny layer can be crystallized on the surface better than that of atomic layer deposition. This heterostructure increases efficiency and the photoluminescence (PL) properties of the substrate [11].

Doping metal ions, such as Cu^{2+}, Mg^{2+}, Fe^{2+}, Fe^{3+}, Al^{3+}, or any other compatible compounds into ZnO NPs, can generate more useful properties like optical, Photoluminescence, electrical properties [12–15]. Doping can be done on either substitutional or interstitial sites. It can also be used for surface capping in stable colloidal solutions. They are equally good at making nanocomposites, heterostructures, and hybrid structures using suitable dopants [16,17]. Several researchers have reported that the properties of ZnO NPs also depend on the type of synthesis method [18–21].

In the present work, the structure, optical and photoluminescence properties of pure, Fe doped, and glucose capped ZnO NPs were investigated using different characterization techniques. All samples were

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Enhancing Productivity of V-Trough Solar Water Heater Incorporated Flat Plate Wick-Type Solar Water Distillation System

This experimentation deals with the comparative study of a flat plate wick-based solar water distillation system (SWDS) with and without V-trough (VT) solar collector (SC) under the actual environmental conditions of Salem, Tamilnadu, India, as an attempt to enhance the productivity of the solar water distillation system. The influences of wick material, solar intensity, flow rate, and ambient temperature on productivity are also proposed. To ensure accuracy in the experimentation, the overall observation is divided into four spells with four different wick materials. The hourly productivity of the proposed still is compared with the standard theoretical equation, and the deviation between them is well accepted with ±10.14%. The maximum convective and evaporative heat transfer coefficients are observed during spell 3 as 2.488 W/m^{2}K and 25.321 W/m^{2}K, respectively. The prediction of Nusselt number and Sherwood number are also proposed to validate the heat transfer and mass transfer, respectively. Compared to polyester, terry cotton, and jute wick materials, fur fabric wick yielded maximum productivity of 4.40 l/day and 6.29 l/day for SWDS alone and SWDS with VT, respectively. The results revealed that the productivity of the SWDS coupled with V-trough SC is 30.12% greater than SWDS alone.
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Introduction

The securities of energy and water are two significant issues which humankind must deal with to achieve the economic improvement of human culture. Nowadays, the scarcity of water is a major issue faced by many regions of Africa and is much worse in developing countries due to increased demand for water because of population explosion and deforestation [1]. In order to address the water scarcity, different conventional freshwater production techniques are considered for domestic, commercial, and industrial applications. Compared with the conventional freshwater production techniques, solar desalination methods are found impressive consideration everywhere in the world because of its abundance and ecologically clean to the environmental concerns [2,3]. At the same time, the production of freshwater using solar energy is not only gifted and promising technology for sustainable development, but also it restricts the higher level of energy consumption and emission of greenhouse gases [4].

The above literature study has concluded that the solar energy based desalination system is the best in terms of money and environmental concerns. The performance of inverted multiwick solar still has been compared with the conventional multiwick solar still. The final results proved that the proposed solar still has produced 20% higher performance than the conventional one [5]. The productivity of a small conventional basin-type solar still has been improved by integrating it with a wick-type solar still which gets warm waste brine solution to the basin. When compared with basin-type and wick-type solar stills separately, the integration of the both stills has been found to be more economical and efficient. The results concluded that the total yearly distilled water production of the proposed still was 85% more than the basin-type and 43% more than the wick-type solar still [6]. A tilted wick-type solar still with a charcoal cloth as an absorber/evaporator material has been designed and constructed. The experimental tests have been conducted under indoor and outdoor conditions. The results predicted that the daily efficiency of the still has been increased by about 53% on clear days in summer and the rise in the salinity of the input water has reduced the efficiency of the system from 37.7% to 20% in indoor testing [7]. The effect of various wick materials has been reviewed in an inclined type wick material based solar still. Compared to terrycloth, jute cloth, and polyester material, fur fabric has produced a maximum yield of 3.63 L/day for the flat plate absorber at 30° inclination. The hardness of water before and after distillation has been found as 5026 ppm and 77 ppm, respectively, at 28 °C (room temperature) [8]. A black-coated jute wick material has been rotated horizontally and vertically inside the still under constant ON time and variable OFF time conditions. Compared to conventional solar still, the proposed still with rotating wick material has enhanced the cumulative productivity by 315% with nanofluid and by 300% without nanofluid [9].

The effect of an external reflector with different inclinations on the productivity of a basin type solar still has been examined experimentally in summer, autumn, and winter. The presence of internal and external reflectors has improved the daily yield. The increase in the productivity of the still has averaged as 19.9% for the still with internal reflector only, and 34.5%, 34.4%, 34.8%,

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NFC based data monitoring and medication scheduling for patients in hospitals

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ABSTRACT

Patient medication programming is crucial for successful day-to-day tracking in a health sector. It should be pointed out that a well-designed medication plan and data management system will help to access prescription care quickly and efficiently and to increase patient fulfilment. We normally have patient arrivals and registration formats filled out and we wait until the date and availability of the doctors have been settled upon. In the past, there have been some studies into the development of online and mobile appointment. Some have priority appointments.But there is still the wait and the pause in the consideration of a patient. In this regard a preceding updating and appointment system based on the Near Field Communication (NFC) has been established that enables patients to tap the NFC appointment chart at their reception or in their nurse pc or the doctor pc at their hospital/clinic for regular and emergency therapy. The system has a priority scheduling of medicinal items and NFC (RFID) card notification, which relies purely on nurses rather than on software with a message warning service using the Internet.

Selection and peer-review under responsibility of the scientific committee of the Emerging Trends in Materials Science, Technology and Engineering.

1. Introduction

The tracking of patients and scheduling of appointments draws more interest as healthcare demand rises. The growing demand for data maintenance and Automation for the relevant care processes, including appointment scheduling and medication collection, arises from the number of patients in hospital stages. This would improve patient care / medication/treatment as well as patient satisfaction by keeping the prescription in line, and the difficulty in hospital administration.

Many methods have been introduced to improve workflow and waiting time such as online registration and appointment scheduling etc. But these systems do have certain time constraints. Based on previous treatment upgrades and advanced health care, the NFC-based system places a lot of pressure on patients' data. The need for new ways of delivering more effective health care and the implementation of significant benefits in ICT has led to a growing use of ICT applications in the last decade.

The role of ICT is important to the creation of these activities, so that technical integration such as RFID can play a major role. They improve protection and efficacy to identify patients and to developed intravenous blends and components compared to other identity technologies (name, lot no, expiry date). In the case of a medical alert, the registration of this information enables the immediate comprehension of the actual patient to whom a great deal of relevant medication has been provided. Other technology such as QR or bar code do not fulfil all project requirements (although they are to be recommended for other scenarios). One key explanation for this is, without a clear line of vision between the tag and the reader, not allowing the placement of a patient or medication in real time or at a distance of hundreds of tags simultaneously.

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Implementation of wireless home-based automation and safety arrangement using power electronic switches

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ABSTRACT

The tools and technology used in home based automation on 6LoWPAN are described in this paper. This is an IP-based protocol, which benefits from the absence of any additional layer or logic for node communication in or out of the network. Remote controls of the home automation system and home appliances have been a field of focus since the conception of the Personal Area Network. Our personal world became smarter and more digital gadgets by implementing IOEs (internet of things) and handheld devices. There are also many foundational wireless protocols for this reason in today's industry. This problem has always been an economical compromise for separate home appliances for a complete house environment and interoperability. This paper looks at both facets of home automation by switching the emphasis from smart to home systems to the point where the technology is powered (the switches). The two aspects of home automation are discussed. For these switches, we have alternate power semiconductor switch alternates and eventually edge them to a module for home automation and control over Internet/intranet. For the entire safety of home automation, a working house automation concept is presented, along with intelligent electronic control changes and a model archetype.

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1. Introduction

The purpose of the product is to build a cost-effective solution that provides home appliances remotely and allows for intruder protection in the house or home in the absence of a house owner. Due to the advancement of the low cost system the system offers availability. All systems must now be more easily and reliably regulated from anywhere in the world. For several years, the idea of 'Home Automation' has been in operation. HASs that provide unified lighting control, appliances that provide greater comfort, energy efficiency and safety. End customers, the poor and the aged, do not necessarily support these programmes because of their complexities and costs.6LoWPAN stocks minicomputer features, in addition to its GPIO pins, where you can attach other components and computers. It designs, installs and controls domestic equipment by computers and systems. The machine design block diagram is seen in Fig. 1.

2. Design of power semiconductor switches

In utmost cases the power semiconductor devices involve the different kinds of systems that activate the power semiconductor switches through the gate signal. Here we have supplied a microcontroller port for the driven circuits where the illuminations and aficionados are moved automatically according to user specifications as shown in Fig. 2.

For on/off power, we primarily use a control microcontroller to relay the signal to the TRIAC, and the swapping procedure is car-

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On-chip cache memory protection with tag overflow buffers and VLSI implementation

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ABSTRACT

A increasing barrier in the development of the future generation of reliable microprocessors has secure memory on chip against soft bugs.Present efforts primarily focused on improving cache data set performance.A tag array also needs massive production efficiency for soft factual errors for its vital significance for caching entry accuracy.Using the memory access address location, it is recommended to repeat the most recent access to tag documents in the tiny tag duplication buffer (TRB) in order to maintain the tag list skill integrity in the cache memory.

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1. Introduction

Domain-specific programmes are typically customized with a very well-defined application mix, leading to high memory access trend forecasting. This functionality makes it easy to incorporate critical application-specific improvements.

Despite their organic versatility, which offers quick access to adjustable caseloads, caches can benefit from such optimizations. Manipulating the high location of the memory references is among the most natural ways to exploit the predictive ability of shared memory behaviours in a cache; recent work has shown that regular embedded programmes will degrade into a few locations.

2. Low power

In today's technology sector, low power was the main trend. A need for low power has led to a major fundamental change that power dissipation is now as essential a factor as efficiency and location. This article discusses various techniques and methodologies for the design of lowpower circuits and systems. It explains the several issues affecting designers at the technical, logic, circuit and system level and introduces some of the strategies that were formulated to address these complexities.The article ends with the potential problems that can only be tackled in the design of low-power and high-caliber systems.

3. Existing system

The coding method is used for securing L1 caches on the chip fairly cheaply in modern robust microprocessors, such as Itanium, power microprocessor and IBM Power 6.But the coding of fundamental parity cannot identify a strange number of bit errors without the opportunity to reconstruct an error. In comparison, ERC codes typically contain one patch and double-detection errors (SEC-DED). However, owing to the total reliability and increased energy demand incurred by ECC encryption and decryption the ECC is an unwilling alternative to high-speed L1 caches.

4. Tag replication buffer with pointer space

In Fig. 1, we use tag cache to repeat tag entry as TRB-CAT framework to adopt the pointer concept and change the system for our long-lasting ventures. In Fig. 1, The pointer segment is placed on the side of the name. Per tag inclusion in the initial tag array has a pointer showing its replica position in the TRB. Only each dupli-

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Analysis of Power Flow in Grid-tied Voltage Source Inverter System

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Abstract: This paper provides different analysis of grid-integrated inverter system. Generalized controller, real power and reactive power flow of grid-connected inverter has been discussed. Phasor diagram and circuit diagrams are provided and explained.
Keywords: Grid connected inverter, phasor diagram, reactive power flow

Introduction

Renewable energy sources such as PV and wind turbine are connected to utility-grid using power conditioning unit (PCU). Generally PCU can be either single-staged or multi-staged. In single-staged PCU, DC-AC inverter is used. For power de-coupling between renewable energy source and the utility grid or load, dc-link capacitors are used. Higher dc-link ripple causes oscillations in maximum power point tracking which causes power loss which eventually reduces the efficiency of the system. Different type of inverter topology and issue of leakage current suppression has been studied in [1]. Selection of DC-link capacitor has been discussed in [2-5]. The present work describes many important factors in grid- connected PV system. Harmonic content, DC-link capacitor sizing and selection, L/LC/LCL filter analysis has been discussed in this paper

Grid Connected Voltage Source Inverter

Figure 1 shows the distribution grid where PV system is connected at the point of common coupling (PCC). PV generation system is connected to PCC with the help of an isolation transformer.

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Comparative Analysis of Two-Level and Multi-Level Inverter Configuration

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Abstract: This paper provides a comparative analysis of two-level and multi-level inverter configuration. Multi-level diode-clamped DC-AC voltage source inverter is analysed. Circuit operation, simulation has been discussed in this paper.
Keywords: MLI, VSI, Diode clamped DC-AC VSI

Introduction

DC-AC power converter are widely used in generation, transmission as well as distribution of electric power. DC-AC converter plays a vital role in control of variable speed drive, HVDC, FACTS, UPS, RES etc.

According to different levels of the output waveform, DC-AC converter can be classified either as two-level inverter or multi-level inverter. Multilevel inverter (MLI) is suitable for high power, medium voltage situation. It provides a staircase waveform which is not exactly a square wave [1]. A good review paper of multilevel inverter can be found in [2-6]. A number of MLI topologies have been provided in these paper which are very popular and are used for different applications. In [7], current control scheme for three-phase grid integrated renewable energy source has been discussed.

This paper provides a comparative analysis between PWM VSI and three-phase three-level MLI has been discussed. Closed loop control scheme of 3-phase 3-level MLI using SVPWM has been discussed and simulation results have been provided as discussed in [11].

Pulse width Modulated Voltage Source Inverter

Figure 1 shows the circuit diagram of 3-phase pulse width modulation based voltage source inverter which comprises of 6 IGBT and 2 capacitors, DC source and a three-phase load. Gate pulse need to be given to the IGBTs for operation of VSI. It operates in 2 different conduction mode i.e. 120 conduction and 180 conduction.

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Design of Virtual Laboratory for Digital Signal Processing Course

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Abstract: This paper gives a brief idea about the need and advantages of virtual instrumentation in engineering education and considers a case study of digital signal processing course and develops a simulation laboratory for the same. This laboratory develops multiple experiments which is simple and the students can understand the concepts in a proper manner with the help of virtual instrumentation graphic user interface.
Keywords: Virtual instrumentation, signal acquisition, signal processing

Introduction

One of the widely used graphical programming language in academic as well as industry is Laboratory Virtual Instrument Engineering Workbench (LabVIEW). It is suited for various application such as data acquisition, data processing and analysis. The software is suited for system-level design concept. The software has been developed by National Instruments (NI). LabVIEW is used to teach the fundamentals concepts of different subjects by simulating the concepts using graphical programming approach. Many pedagogical approach have been investigated in literature. Design of digital signal processing system using LabVIEW and TMS320C600 has been discussed in [1]. LabVIEW based simulation for Digital communication and Digital Signal Processing have been discussed in [2]. DSP based remote control laboratory has been discussed in [3]. Virtual spectrum analyser based on data acquisition system has been discussed in [4]. LabVIEW has been used in digital signal, digital image and video processing course in [5]. LabVIEW based design of instrumentation laboratory has been discussed in [6-7]. This paper provides a detailed design of digital signal processing course for undergraduate students where the students can simulate the fundamental concepts of digital signal processing using LabVIEW and learn the concepts in a better way.

Section II provides details of virtual instrumentation based DSP lab and provide details of experiments. Section III provides the concluding remarks.

Study of Direct Torque Control Scheme for 3-phase Induction Motor

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Abstract: This paper provides a study of direct torque control scheme of 3-phase induction motor. Mathematical modelling of induction motor and direct torque control scheme has been discussed in this paper. Using direct torque control speed and torque of the motor can be controlled.

Keywords: 3-phase induction motor, direct torque control, flux, speed

Introduction

Induction motor direct torque control is a decoupled control mechanism which decouples and control the flux and torque of the motor independently. Adjustable speed drive with induction motor and direct torque control are a very challenging area of research.In [1] authors provided direct torque control (DTC) scheme with space vector modulation (SVM). A exhaustive survey of different control techniques of AC motor has been discussed in [2]. Direct torque control provides improved flux and torque response in induction motor [3]. Apart from direct torque control, induction motor can also be controlled using model predictive control and indirect field oriented control [4-6]. Induction motor is applied in various applications. Electrical vehicle is one such application where induction motor is used [7].

This paper provides a simulation analysis of direct torque control scheme for 3-phase induction motor. Simulation and mathematical analysis has been provided in this paper.

Stability Analysis of Integer-order Interval System using Kharitonov Theorem

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Abstract: This paper provides a detailed analysis of stability analysis of integer order interval system using Kharitonov theorem. Detailed formulation of khartionov theorem has been discussed. An example of integer order interval system has been provided and khartionov system has been applied to it.

Keywords: Integer order system, stability analysis, Khartionov theorem

Introduction

Kharitonov theorem is one of the most widely used theorem to access robust stability of an integer order interval system. Interval system, its theory and application has been detailed in [1]. The application of interval analysis to robust control has been discussed in [2-3]. Let us consider an integer order interval system represented as

$$G_{IOIS}(s)=\frac{\sum_{i=0}^{n-1}\left[n_i^-,n_i^+\right]s^i}{\sum_{i=0}^{n}\left[d_i^-,d_i^+\right]s^i} \tag{1}$$

Eq(1) can be represented as

$$G(s,P,Q)=\frac{N(s,P)}{D(s,Q)}=\frac{\left[P_0^-,P_0^+\right]+\left[P_1^-,P_1^+\right]s+..+\left[P_{n-1}^-,P_{n-1}^+\right]s^{n-1}}{\left[Q_0^-,Q_0^+\right]+\left[Q_1^-,Q_1^+\right]s+...+\left[Q_n^-,Q_n^+\right]s^n} \tag{2}$$

Asymptotic stability has been discussed in [4] whereas generalized Kharitonov theorem has been discussed in [5]. Necessary condition and complete derivation of Khartionov theorem has been discussed in [6-8, 10, 11].

This paper provides the analysis of Kharitonov theorem with zero inclusion principle. The kharitonov stability of different interval transfer function has been proved using different examples.

Effect of Cr Substitution on Magnetic Properties of Co–Cu Nano Ferrites

Article in Solid State Technology · January 2021

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On spectral relaxation approach for Soret and Dufour effects on Sutterby fluid past a stretching sheet

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Biologically synthesized silver nanoparticles from shorea robusta L. plant and associated antibacterial property

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ABSTRACT

Extracts from plants were lately utilized for nano particles green synthesis as they abundantly possess bioactive compounds. These compounds possess nano particles (NP's) due to reduction of the metal ions in a one step green synthesis technique. The present study substantiates for the first time of the facility of Shorea robusta plant parts (leaf and stem) extracts grown under in vitro condition for the biosynthesis of silver nanoparticles (AgNP's). At 472 nm for leaf and 441 for stem of the surface plasmon resonance were found and confirmed the formation of AgNP's. Moreover, SEM images showed that nanoparticles had spherical morphology. Furthermore, particles crystalline nature confirmed by X-ray diffraction studies, possible biomolecules responsible in bio reduction of Ag ions by FT-IR analysis. Antibacterial attempt confirmed of biosynthesized AgNP's against bacteria. Based on the results, by the plants growing under controlled conditions, it is practicable to create Np's with preferred possessions.

Selection and peer-review under responsibility of the scientific committee of the International Conference on Advanced Materials Behavior and Characterization.

1. Introduction

Particle synthesis with at least one dimension in the range of 1–100 nm and ensuing in elevated surface to volume ratios is called Nanotechnology. The dwindle size of the particle, not only does the proportion of surface area to volume amplify but also the biological, chemical and physical attributes of the particles be at variance compared to their counterparts immensity [1]. Np's exhibit implausible biochemical and physiochemical characteristics and used for different reasons in various fields [2].

Nano materials are of immense use in different fields [3]. Among nano materials, AgNp constituents play a key role in the medical owing to their striking different features. AgNP's are recognized to anti-platelet doings [4]. Numerous ways are known to create AgNp's with different techniques [5–8]. Exploiting plant extracts to Np's is an environmental-friendly green procedure owing to easy availability of plant metabolites [9]. Procedures engaged for making Np's by exploiting extracts from plants are readily scalable and cost-effective. [10]. The AgNp's obtained from plants were then studied for their antibacterial potential against human pathogenic bacteria [11]. With respect to the relatively costly techniques with regard to microbial processes and whole plants, nano particles made from plant extracts, owing to their therapeutic sort are put to use in drugs [12,13].

The various components of S. robusta, in India are customarily used for treating a diverse range of ailments. In Unani medicine system, for treating menorrhagia, spleen enlargement and eye irritations, resin is utilized [14]. The resin along with honey is utilized to treat dysentery, piles and weak digestion [15]. This has been used in diarrhoea, while extracts from leaves are found to own considerable anti-inflammatory features [16].

Present studies are focused on the creation of AgNp's from leaves and stem of S. robusta by spectroscopic techniques and the bio-active efficacy of the created Np's is experienced with respect to various pathogenic bacteria.

2. Materials and methods

2.1. Plant material

S. robusta belongs to the Dipterocarpaceae family. The leaf and stem parts of S. Robusta are collected in Visakhapatnam, Andhra

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Anticancer and antibacterial activity of green synthesized silver nanoparticles using Adina cordifolia

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ABSTRACT

Extracts from plants are put to use for the green production of nanoparticles, since they possess compounds which have the potential metal reducing ability, biologically active and environment-friendly, in abundance. The present study investigates the production of silver nanoparticles (AgNPs) via the process of reducing silver nitrate by the cell-free leaf and stem aqueous extracts of Adina cordifolia (A. cordifolia) and its potential anticancer and antibacterial doings. The UV–Visible, FT-IR, XRD and SEM confirmed the synthesis of smaller, uniformly spherical AgNPs (10–45 nm) from silver nitrate upon incubation with leaf and stem extract of A. cordifolia. The A. cordifolia stem extract synthesized AgNPs have shown noteworthy anticancer commotion against human breast and prostate adenocarcinoma (MDA-MB-231 and PC-3) cells with the IC50 values of 64.92 and 68.01 μg/ml, in that order. Whereas, the leaf extract synthesized AgNPs comparatively shown slightly lower anticancer commotion with the IC50 values of 82.58 and 80.65 μg/ml, respectively. The synthesized AgNPs have also shown higher antibacterial doings against Bacillus subtilis (Gram positive) and Escherichia coli (Gram negative) in comparison to Gentamycin. Hence, the AgNPs obtained by green synthesis can be therapeutically explored against adenocarcinoma and bacterial infections.

Selection and peer-review under responsibility of the scientific committee of the International Conference on Advanced Materials Behavior and Characterization.

1. Introduction

Nano science is a budding branch in the scientific field, analyses in detail about the synthesis of variable sizes, shapes and compositions of nanomaterials, which are having diverse range of controllable dispersity [1,2]. The nanomaterials that are in 1–100 nm size are known as nanoparticles. Inorganic nanoparticles have raised much attention for its heavy surface area to volume ratio, specificity and sustained release [3]. Biological preparation of (AgNPs) has tremendous prospective owing to its utility in disinfective medicine and device development [4]. The preparation process of nanoparticles via green production regarded as cost-effective and environmental-friendly, was proven to be a better method owing to its properties like sluggishness, well-controlled growth of crystals, stability and convenient handling [5–7]. Various reports had shown antibacterial [8,9], antioxidant [10], cytotoxic [11] and anti-inflammatory [12] properties of green synthesized nanoparticles.

WHO (World Health Organization) reports say that, global cancer burden is significant and increasing, up to 29.4 million by 2040. Adenocarcinoma is a cancer of glandular tissue. In men, cancer located at prostate the list gland leads and cancer to breasts is the foremost basis for death among women which accounts to 28% of the whole lot [13,14].

Under immune levels lowered state these harm-less microorganisms could turn into oppurtunistic form. Bacillus subtilis (B.subtilis) is one of the gram positive bacteria which causes food poisoning [15] and is well reported in inducing bacteremia [16] in cancer patients. Escherichia coli (E.coli) gram negative

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Thermal management in TSV based 3D IC Integration: A survey

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ABSTRACT

Three Dimensional IC (3D IC) integration is one of the emerging technology which suits CMOS applications by stacking various IC layers vertically. In 3D IC, IC Layers are interconnected electrically using Through Silicon Vias (TSV's) and mechanically by Cu–Cu bonding. The major drawbacks in 3D IC structures are thermal issues between layers and noise coupling between TSV-to-substrate and TSV-to-TSV which leads significantly on the overall system performance. This paper presents an extensive survey on one of the major issue in 3D based IC integration technique called thermal issues between the layers and how the researchers have tried to overcome the problems by introducing various materials which are suitable for elimination of hotspot, by introducing spreaders among the layers. This extensive survey work shows the complete roadmap for the thermal management in future IC Integration.

Selection and peer-review under responsibility of the scientific committee of the International Conference on Advances in Materials Research – 2019.

1. Introduction

The Internet of things took a rapid increase in today's technology. Different technologies are embedded in a single system to operate. MOSFET plays a vital role in the Internet of Things as the transistor is the building block of electronics. MOSFET scaling is one of the techniques for miniature electronic goods as explained by Moore's law for advanced technologies. The scaling of the transistor for less area in fabrication results in an increase of the metal layers as the IC is in planar form. These metal layers result in an increase in the delays and high density of the wires. The high density of the wires makes the IC fabrication complex and increase in the parasitic capacitance. The domination of the parasitic capacitance results in inter-connects delay. The interconnect delay became a vital issue along with the transistor delay. As scaling further increases the interconnect delay becomes the major issue. The need of eliminating the interconnect delay became a concern for the IC. One prominent alternative technology is a three-dimensional Integrated Circuit. It explores the IC in three dimensions. 3D IC is one of the technologies suitable for deep sub-micron designs. It offers many advantages in deep-submicron technology. The advantages are (a) The vertical connections of the IC make the delay of resistor–capacitor decreases as in planar connection the connection is between the different functional blocks, (b) The decrease in delay gives the enhancement in IC performance and a decrease in power consumption, (c) increase in the memory bandwidth makes the storage ability of the data in the Integrated circuit more, (d) Heterogeneous realization of IC is useful in various memories, logic applications, and (e) 3D IC makes the package smaller so the high-density package exists in 3D IC. The higher density package and smaller IC makes the reduction in delays and power consumption.

3D IC uses silicon through via bonding for various stacks to get an exact alignment. Researchers have explored ways to find the bonding effectively [1–12]. Noise coupling and thermal issues are the major limitations in three-dimensional technology. Noise coupling is the interface between different domains. There are different noises that exist in an integrated circuit of three-dimension. Among all those noises substrate noise, flicker noise, thermal noise plays a crucial one. Due to these noises, the introduction of interference in the circuits exists. The noise in the three-dimensional integrated circuit affects the sensitive circuits. This will result in the degradation of the performance of the system. The noise produced due to the connection of the substrate is switching noise.

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A systematic review on full adder designs in Quantum-dot Cellular Automata

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ABSTRACT

Quantum-dot Cellular Automata (QCA) is a promising transistor-less nanotechnology that is used for designing digital circuits at nano dimensions. Its major advantage is that QCA enables the circuits to operate at faster rates compared to CMOS. Any large digital circuit application uses full adder as a basic component. Many researchers have designed full adders with different number of quantum cells, in various sizes and layers and different delays. This paper presents a detailed report of all existing full adders designed using QCA. A comparison of full adder designs is carried out to identify the better one. Simulation and analysis of existing QCA designed full adders is performed using QCADesigner tool.

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1. Introduction

Quantum-dot Cellular Automata (QCA) is a promising futuristic transistor-less nanotechnology which supplants the current CMOS technology since further scaling of MOS transistor leads to several problems. They are short channel effects, quantum effects, leakage currents, lithography and fabrication issues. Therefore, Moore's law cannot be continued for future technology. QCA is the fastest nanotechnology which was first proposed by Lent C. S. et. al. in 1993 [1]. Later, first fabrication took place in the year 1997. Quantum Cell is the fundamental key point of QCA. This Quantum Cell is in the shape of a square, and has four dots positioned at its corners. It also contains two electrons. Because of electrostatic interaction between these two electrons, they exhibit two polarizations for characterizing as two binary states, logic 0 and logic 1. Using quantum cell, digital circuits can be realized as shown in [2]. In contrast to the CMOS, a clocking mechanism is applied in QCA to both sequential and combinational circuits. The clock scheme decides the propagation delay of the digital circuits in QCA [3]. One of the main important tasks is power estimation of QCA circuits. Several works have been carried out in the analysis of area and power of QCA circuits. Another important issue with QCA is its operating temperature. In the early days, QCA operates at cryogenic temperature as 3 K. Later, the circuits which can function at room temperature were come into existence called as QCA circuits [3].

The paper is organized as follows. The current section deals with the introduction of the paper. Section-2 describes the basic structures of QCA devices. The clocking technique is explained in section-3. The literature survey of the one bit full adder designs proposed by various authors is completely studied in section-4. Section-5 gives the detailed explanation of full adder block diagram, logic diagram and QCA layouts of most recent and optimized full adders. Section-6 discusses the comparison of all existing QCA full adder layouts. Section 7 gives the conclusion the paper.

2. Basic structure of QCA devices:

QCA technology comprises of two main gates namely Majority Voter and Inverter gates. These two gates were developed with quantum cells that are shown in Fig. 1. As discussed earlier, Quantum cell contains of 4 dots and 2 electrons. When no electric field is applied, the electrons are in rest position at middle level of the cell.

During excitation the electron exhibits any one of the two polarizations. The polarization determines the logic state of the quantum cell. Polarization −1 indicates logic 0 and Polarization 1 indicates logic 1 [1]. If ρ is the charge developed by the electron in a dot in quantum cell, then the polarization can be proved by the simple formula as

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Novel optimized tree-based stack-type architecture for 2*n*-bit comparator at nanoscale with energy dissipation analysis

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Abstract

Comparator is an essential building block in many digital circuits such as biometric authentication, data sorting, and exponents comparison in floating-point architectures among others. Quantum-dot Cellular Automata (QCA) is a latest nanotechnology that overcomes the drawbacks of Complementary Metal Oxide Semiconductor (CMOS) technology. In this paper, novel area optimized 2*n*-bit comparator architecture is proposed. To achieve the objective, 1-bit stack-type and 4-bit tree-based stack-type (TB-ST) comparators are proposed using QCA. Then, two tree-based architectures of 4-bit comparators are arranged in two layers to optimize the number of quantum cells and area of an 8-bit comparator. Thus, this design can be extended to any 2*n*-bit comparator. Simulation results of 4-bit and 8-bit comparators using QCADesigner 2.0.3 show that there is a significant improvement in the number of quantum cells and area occupancy. The proposed TB-ST 8-bit comparator uses 2.5 clock cycles and 622 quantum cells with area occupancy of 0.49 μm^2 which is an improvement by 10.5% and 38%, respectively, compared to existing designs. Scaling it to a 32-bit comparator, the proposed architecture requires only 2675 quantum cells in an area of 2.05 μm^2 with a delay of 3.5 clock cycles, indicating 9.35% and 28.8% improvements, respectively, demonstrating the merit of the proposed architecture. Besides, energy dissipation analysis of the proposed TB-ST 8-bit comparator is simulated on QCADesigner-E tool, indicating average energy dissipation reduction of 17.3% compared to existing works.

Keywords Quantum-dot Cellular Automata (QCA) · Comparator · Tree-based stack-type architecture · Energy dissipation analysis

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Microstructural, thermal, electrical and magnetic analysis of Mg^{2+} substituted Cobalt ferrite

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Abstract
Magnetic nanoparticles of $Co_{1-x}Mg_xFe_2O_4$ ($x=0$, 0.08, 0.16, and 0.24) were prepared using sol–gel technique with auto-combustion. Citric acid was used as a chelating agent. The X-ray diffraction (XRD) studies showed that the lattice constant of cobalt ferrite decreases with the rise of magnesium proportion. Field-effect Scanning Electron Microscopy (FESEM) was used for the morphological study of the powdered ferrites. Energy Dispersive Spectroscopy (EDS) gave the compositional analysis of the samples. Two major vibrational frequencies from the Fourier Transform Infrared (FT-IR) Spectroscopy validate the spinel cubic ferrite structure. Raman spectroscopy exposes a doublet-like peak behaviour in A_{1g} and E_g modes as a result of different ionic radius of ions belonging to Mg/Co and Fe. The magnetic parameters like saturation magnetization, coercivity, and remanent were also thoroughly analysed against the increase in the Mg-density in cobalt ferrite. The DC electrical resistivity is found to increase with Mg concentration. The room temperature, electrical and dielectric properties were investigated in the frequency range between 100 and 5 MHz. The observed results were related to the microstructural characteristic and amount of Mg dopants.

Keywords Magnetic nanoparticle · Magnetic parameter · Electrical property · Dielectric property · Microstructure

1 Introduction

Cobalt ferrite is of the spinel class material with fascinating magnetic features that are important in high-tech systems. Particular attention should be given at the time of preparation of the ferrites that are applicable in high-density magnetic recording, electronic devices, and medicines [1–3]. cobalt ferrites are thermally stable materials which help to use them in a wide range of temperature. They are used in as a pigment and anode materials in lithium-ion batteries [4, 5]. They have low saturation magnetization [6]. The previous works in the literature on Mg-doped Cobalt ferrite reported the drastic effects on their structural, electrical and magnetic properties which drag our attention for further study on this composition [7].

Recently, the studies on Cobalt ferrite are focused on exploring novel materials that can control and manipulate the magnetic and electric parameters which will help in the application areas of sensors, information storage, catalysts and spintronic devices [8–10]. Therefore, the challenge is to identify their suitable compositions exhibiting large values of magnetization, magnetostriction and dielectric polarization at room temperature [11]. The magnetization and polarization mechanisms depend not only on the structure but also on the synthesizing conditions of the material [12–14].

In this paper, we are focusing on the preparation method, and the study of dielectric, conductive and magnetic properties of Mg substituted Cobalt ferrite materials. Raman spectroscopy is used for the detailed study of vibrational modes of molecules that supports the other structural analysis by FT-IR and XRD that are performed simultaneously in this work.

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RESEARCH ARTICLE

Intelligent signalling system to control traffic in vehicular ad hoc networks

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Abstract

Traffic congestion problem persists more at junctions and causes inconvenience to public. Owing to this, people may not reach their destinations in time. Although there are alerts in mobile phones regarding arrival times of flight services and other journey related information due to sudden traffic jams at junctions these advanced technology innovations are being becoming fragile. Since long, many researchers have been putting their efforts to find remedies for reducing traffic congestion. **Objectives:** The key focus is on balancing forwarding time and waiting time at junctions based on the number of vehicles arrived at that junction. **Methods:** The proposed system uses Internet of Things (IoT) based monitoring to control signaling system. IR sensors are used to count number of vehicles passing over the lane by triggering clock for object detection. The signaling time can be changed dynamically based on the vehicle count, so that more time is allocated to the lanes which have more traffic and the remaining time is adjusted among other lanes. This reduces congestion at dense traffic lanes. **Findings:** There will be time variant setting of signal lights based on the density of the traffic. The dense traffic lanes will be allotted more time and will be cleared first. Expanding on this point, the time adjustment is done based on the vehicle count not on periodical fixation of intervals. **Novelty:** The ecosystem developed provides an ultimate solution to vehicle users for comfortable movement on the roads without being delayed.

Keywords: Traffic density; IR Sensor; VANET; ITS; IoT; clock

1 Introduction

The exponential increase in the number of vehicles leads to transportation issues. Due to flooding of vehicles and signaling intervals vehicles are forced to wait at junctions. The performance of the road clearing mechanisms is to be improved to avoid roundabout travels. Research was being worked on finding optimal path. The optimal

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Mechanical and microstructural characterization nickel electroplated metal matrix composites

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ABSTRACT

The current study chiefly depicts the fabrication and investigation of mechanical and microstructural properties of Al7SiMg/RHA metal matrix composites with a different weight percentage of reinforcement by employing stir casting technique. Nickel plating is electrodeposited on to the base alloy and metal matrix composites using a conventionally stirred electrolytic watts bath. The microstructure characterization of the composites and the nickel electrodeposition superficial morphology is inspected by employing scanning electron microscope, X-ray diffraction techniques. The prime mechanical properties like density, hardness, and tensile strength of the metal matrix composites were investigated for the base alloy and Al7SiMg/RHA metal matrix composites. Scratch test is performed for nickel plated specimens for determining the adhesion characteristics. Hardness and residual stresses for nickel plated specimens are studied and presented in this paper.

Selection and peer-review under responsibility of the scientific committee of the First International conference on Advanced Lightweight Materials and Structures.

1. Introduction

In our daily routine, metal matrix composites have found applications in almost all fields. The appropriate capability of integrating diverse material systems (i.e. metallic- non-metallic ceramic) renders the convenience of limitless variations. The enhanced properties of the unique materials are mostly determined by the lone constituent's characteristics. These reinforced metals have a distinct set of objectives. Lightweight reinforced metals have been the first priority in sectors where weight decrement is a prime factor. In Al metal matrix composites the matrix body is of aluminium/aluminium alloy (Al-Cu, Al-Si and Al-Si-Mg). The other constituents such as silicon carbide, aluminium oxide, boron carbide and zirconium can be embedded into the aluminium/aluminium alloy matrix which serves as reinforcements. The reinforcements added to the core material system should be stable under elevating working temperatures and non-reactive. Hardness, tensile strength, wear resistance, density parameters of aluminium/aluminium alloy are elevated using SiC, boron reinforcement [1–3]. Aluminium reinforced composites offer distinguished high strength to low weight properties due to which they easily found their way to automobile aerospace and aeronautical industries.

Aluminium metal matrix composites are used in the manufacturing of bushes, brake rotors, ventral fins and fuel access covers for aeroplanes, electronic packages [4,5]. From the preceding inquiries, it is obvious that elevating the reinforcement percentages into the matrix core system has elevated the ductility, hardness and ultimate tensile strength in comparison with the monolithic alloy systems. Fabrication routes, type of reinforcement, the weight percentage of reinforcement employed during the fabrication of the composites played a vital in enhancing the mechanical behaviour of composites [5–10]. However these reinforcement's accounts higher fabrication costs therefore another kind of reinforcement like fly ash and rice husk ash are often appraised as inexpensive filler systems for enhancing the material properties [11–14]. Coatings are thin layers of covering deposited on the surface of an object usually termed as a substrate, to improve its critical characteristics and to act a potential barrier against environmental deterioration. Electrodeposition technique involves covering of the metal substrates surface with a thin layer of metal. Nickel plating

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Inspection of dynamic power in micro-grid system during impedance-based compensation

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An Efficient Energy Management of Hybrid Renewable Energy Sources Based Smart-Grid System Using an IEPC Technique

K. Bapayya Naidu, B. Rajani, A. Ramesh, and K. V. S. R. Murthy

Abstract In this paper, a grid-connected microgrid (MG) is proposed to find energy scheduling for optimal energy management. Here, the MG system has a photovoltaic system, wind turbine, battery storage (BS), as well as microturbine (MT). An improved emperor penguin colony (IEPC) technique can continuously track the necessary load demand of the MG system connected to the grid. Here, the huddling behavior of EPC is improved by crossover and mutation operator. The goal of the IEPC method is described by the participation of fuel cost, a variation of power per hour of the grid, cost of operation, and maintenance of the MG system connected with the grid. The convenience of RES, power demand, as well as state of charge of the storage element denotes limitations. The battery is employed from an energy source, stabilize and permit units of a renewable energy system to continue the operation in delivering steady as well as stable output power. Results of comparison demonstrate the superiority of the IEPC method as well as confirm its potential to solve the issue.

Keywords Optimal energy management · Forecasting errors · Renewable energy sources · Operation and maintenance cost · Batteries

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NSCT And Eigen Features Based Image Fusion

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Abstract: Image fusion is a technique of fusing multiple images for obtaining accurate image with better information compared to source images. The applications of image fusion are in the modern military, multi-focus image integration, pattern recognition, remote sensing, biomedical imaging etc. The specific benefits of Nonsubsampled Contourlet Transform (NSCT) and Principal Component Analysis (PCA) are of huge benefit to the proposed image fusion method. Standard datasets are being used to assess the performance of the proposed model. The obtained results are visually more informative compared with individual images and statistical performance when compared with existing methodologies exhibit robustness in terms of MSE, PSNR, Entropy, Correlation, SSIM.

Keywords: *Medical image fusion, Multiscale fusion, Multi focus image fusion, Image integration, Data fusion, Image fusion.*

I. INTRODUCTION

Image fusion focuses on extracting the most data over two distinct images from some kind of single composite image. The approach of image fusion has several applications, such as biomedical imaging, remote sensing, multi-exposure image fusion, integration of multi-focus images, multi-modality image fusion (e.g. visible and infrared), etc [1], [2]. A quite critical role in research is the careful nature of the fusion law for a particular procedure like multi-modality. In the literary works on a fusion law, applicable to various image fusion implementations, very few papers are listed. In addition, in the current situation, the successful design of a fusion law that extends to different fusion implementations is strongly required.

Several methods of image fusion mostly use pre-processing techniques for image registration but few papers have already occurred in literary works that would not require registration of input images. Almost all of the datasets available consist of registered images, but the newly arrived fusion methods do not address source image registration, but that is important to note image registration since if source images aren't in the same size, it influences the overall fused image. Figure 1 depicts a simple fusion process. There are numerous types of fusion rules projected to fuse images such as coefficient grouping, choose maximum, Weighted average, etc[3], [4].

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Color Image Segmentation Using Soft Rough Fuzzy-C-Means and Local Binary Pattern

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ABSTRACT
In this paper, a color image segmentation algorithm is proposed by extracting both texture and color features and applying them to the one-against-all multi class support vector machine (MSVM) classifier for segmentation. Local Binary Pattern is used for extracting the textural features and L*a*b color model is used for obtaining the color features. The MSVM is trained using the samples obtained from a novel soft rough fuzzy c-means (SRFCM) clustering. The fuzzy set based membership functions capably handle the problem of overlapping clusters. The lower and upper approximation concepts of rough sets deal well with uncertainty, vagueness, and incompleteness in data. Parameterization is not a prerequisite in defining soft set theory. The goodness aspects of soft sets, rough sets, and fuzzy sets are incorporated in the proposed algorithm to achieve improved segmentation performance. The local binary pattern (LBP) used for texture feature extraction has the advantage of being dealt in the spatial domain thereby reducing computational complexity.

KEYWORDS: Segmentation, Classification, Clustering, Fuzzy Sets, Local Binary Pattern, Multi-Class SVM Rough Sets, Soft Sets, Texture.

1 INTRODUCTION

COLOR image segmentation (Cheng et al. 2001) is a pre-processing step and used in numerous computer vision, image processing and related applications such as robotic vision, face recognition, content based image retrieval and medical imaging. Segmentation splits an image into distinct regions, such that pixels have a peak value of likeness index in each region and a peak value of disparity index between regions. Image properties such as gray-level, intensity, and texture (Arestah & Hung, 2007) are used to identify similar regions and resemblance of such properties is used to construct groups of regions (Cortes & Vapnik, 1995). Image segmentation algorithms can be categorized into four major groups, i.e., thresholding, clustering, edge based and region based segmentation.

Clustering techniques coupled with soft computing are more explored in recent time for color image segmentation as can be seen in the literature (Krishna & Kumar, 2015; Reddy & Prasad, 2010; Wang & Sun, 2010). Lingras & West (2004) proposed rough k-means (RKM) algorithm for use in clustering of internet users, which was later applied for image segmentation applications. Maji & Pal, 2007 proposed a rough fuzzy c-means (RFCM) algorithm for segmenting magnetic resonance (MR) images. The lower and upper approximation concepts of rough sets effectively overcome the vagueness and incompleteness in MR images. The fuzzy memberships overcome the problem of overlapping of classes.

Mushrif & Ray (2009) proposed color image segmentation using only color features. This work was improved by Morales et al. (2014) by integrating both texture and color features. The information of neighboring pixels is also considered in this method and the number of segments is automatically determined using the histon technique. The histon is a histogram which considers the lower and upper approximation concepts of rough sets. The major advantage of this technique is that the initialization of clusters is not required. The a and b channels of the Lab color space form the color features and a novel standard deviation map is used to extract the texture features.

Freixenet et al. (2004) proposed to integrate the information pertaining to region and boundary for

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Prediction and Analysis of Corona Virus Disease (COVID-19) using Cubist and OneR

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Machine Learning Based Classification for Heart Disease Prognosis

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Abstract

Today Heart Disease is one of the major & leading threats to the people which leads to death globally. Even medical practitioners are not able to predict it easily, which automatically creates a demand for the efficient classification of heart disease prediction. But it is a complex task because of health care system generates a huge amount of data from multiple sources in multiple ways. So there is a need to develop a system to perform classification of Heart Disease forecasting. For these Machine Learning algorithms were used. In this research, various Supervised Machine Learning algorithms like Decision Tree, Support Vector Machine, Logistic Regression, Multilayer Perceptron, Random Forest, and Naive Bayes are applied on the given dataset to classify Heart Disease Prediction and their performance is measured in terms of Accuracy, Precision, and Recall. Based on the outcomes, the Random forest algorithm produces better accuracy than the other algorithms used.

Keywords: *Classification, Heart Disease, Prediction, Machine Learning, Supervised Machine Learning Algorithms, Performance.*

1. Introduction

The Heart is one of the most important organs of our body, which pumps blood to various parts of the human body through veins and arteries. The condition that affects the functionality of the heart is called "Heart Disease". There are some factors that lead many people to have this problem. Some of the major factors include Chest Pain, High Cholesterol levels, Blood Pressure, No Physical Activity, Depression, Alcohol, Age, Smoking, Stress, Family history of heart disease, improper diet, etc..

Heart Disease is now becoming a major disease which in turn decreases the lifespan of humans. According to statistics from WHO, 17.9 million people death caused due to this disease in one year, and globally 31% of deaths happened because of this disease. So obviously there must be efficient monitoring and treatment which requires an automated heart disease prediction system to reduce the number of deaths. This will be now a challenging task for the health care field due to Big Data that means a huge amount of data is generated via different sources at a very high speed. The problem with this data is Rich in data, Poor in knowledge. To address this problem, there are numerous Data mining and Machine Learning techniques to sort it out. These algorithmic techniques are going to implement and execute on the dataset and produce the best outcomes such

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A Novel Approach to provide more Security for Multi-Click Recognition based Textual Graphical Scheme (SMCR-TG)

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Abstract

Nowadays password plays a vital role for User Authentication. To provide more security to information, password should be lengthy and typical. In order to avoid attacks whenever password becomes lengthy it becomes difficult for the users to remember that harder passwords. To overcome this technique called SR-MCR-TG is used which was an alternative to textual passwords. As it is easy to remember pictures than the textual passwords. In this paper, we have proposed an enhanced approach for graphical password based system named SMCR-TG, which offers much compensation to the existing system.

Keywords: *Graphical Password, Security, authentication, SMCR-TG*

1. Introduction

Information security plays an important role for protecting system data or information. So for Identification of a person a process called Authentication is required and most of the commonly used passwords are alphanumeric. In order to resist from brute force attack most of the users prefer strong passwords which is combination of numerical, letters and symbols [1]. As Textual passwords are tough to memorize, different graphical password authentication schemes were developed.

2. Categorization of Authentication Methods

Authentication techniques are of three types. Token based, Biometric based, and Knowledge based authentication

2.1. Token Based Authentication

It permits users to enter their userid and secret password to attain a token which gives access for user to obtain a particular resource without using their credentials. Token based authentication requires users to attain a token before they're granted network entry.

2.2 Biometric Based Authentication

For identification of a person Biometric Based Authentication uses human body characteristics like iris, retina, finger prints, signature and voice [7]. In token based authentication the user may forget the token otherwise key may be cracked so most of the authentication systems are biometric based as it is more secured because the body organs of a person cannot be accessed without their authorization but it requires hardware.

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Disabled Chronicle Management using Blockchain Technology

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Abstract

Digitalization- An era made a tremendous change in the domestic human life associated with the technology and making an individual hooked to this world with never-ending growth. Communication is the only medium in between the earthling. Yet, for the disabled people expressing and conveying any information is tedious. Most of the individuals aid the disabled to do their regular tasks and most of the real disabled are getting failed to avail of their opportunities which are served to them. Documents related to the disabled are still a physical entity. Those are carried out where ever it is required; it may be inconvenient and bothered if it is missing. This paper proposes a new system with a vision to digitalize the certificates related to the disabled is encrypted and stored under blockchain technology making them as decentralized, storing the disabled certificates in the blockchain. The goal of this research is to help the genuinely disabled people and eliminating all other counterfeits from public benefits and it also describes how digitalized encrypted documents can act as a helping hand to disabled ones. By implementing in blockchain-based distributed ledger several obstacles can be solved such as paper-based authentication, duplications of data along with fake individuals can be eliminated, and by therefore improving transparency, efficiency at concrete levels.

Keywords: *Blockchain technology, disabled certificates, distributed ledger, paperless, permissions, smart contracts.*

1. Introduction

Blockchain technology acts as a remedy for various security and authorization concerns that exist in this current world. Day to day one is exercised to prove their identity in numerous manners. The former methods which are implemented up to now were antiquated in the functioning of security concerns. For example, Electronic mails web pages store email and password credentials [1], and further, it may cross-question individuals to know about their date of birth, spouse name, name of the organization working, and so on to legalize them on their networks. Particulars stored are key for stealing one's existence. One of the frightening circumstances is becoming disabled. Generally, disabled face the problems like concession avail during traveling, allowances benefited throughout education, recognition during employment, health care, etc. For example, if a disabled person wants to take admission into a graduation course he/she shall submit the disabled certificate issued by medical authority and avail the benefit. The current process to apply for a disabled certificate is time-consuming and no possibility to

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A Framework for Subset Pruning using REP Tree

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Abstract: *Basically the count of confirmed cases depends upon number of tests so far carried out.The rate of confirmed cases relies on number of test carried out so far. Based on the figures arrived, the Government organization will impose precautionary measures. In case of patient data analysis for any pandemic disease decision making plays crucial role. If the test reports are inaccurate, underreporting takes place. The reports should be provided on time so as to safeguard the lives of patients. Identification of misclassified examples is a well known problem and is drawing significant attention in heath monitoring units. By and by exactness is the primary concern for evaluation and treatment of the individuals.In order to categorize correct classification labels, two typical algorithms are considered, ZeroR and RIPTree. The ZeroR classifies all the instances with majority of the labels without including any predictors. Since the RIPTree is less prone to error, it provides correct information about misclassified instances.The evaluation metrics can be streamlined with the adaptation of these two algorithms. The two algorithmic outcomes can be cross verified with Repeated Incremental Pruning to produce error reduction (RIPPER) algorithm which classifies true positives exactly. The application of the above algorithms assists in confirming the cases, with varied conditions and datasets.*

Keywords: *ZeroR, RIPTree, RIPPER, Classification, Pruning, Rules.*

I. Introduction

Corona virus is being spread globally since December. No proper diagnostics is available either for curing or for confirming the cases. As viral tests evaluate current infection of the individuals, the analysis of report for confirmed/unconfirmed is playingcrucial role. Finding outstanding classifier is a typical task, because the algorithm must support large datasets at par with accuracy. Researchers need to drill down their data exploration mechanisms by applying

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Corona Disease Clustering Using Radial Basis Function Classifier

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Abstract: *The Government is putting lot of efforts in tracking corona patients. Because of failure in signal communication or due to switching of phones it is becoming futile in tracing. The identification of patients itself became challenging one. The information obtained with the cooperation of patients will alone be not enough to aggregate corona cases. The trials have been making from long since to stop transmission of the spread of the disease and link diseased patients. In this paper, patient clusters are created dynamically using Radial Basis Function classifier. This outlays the functioning of clusters and assists in restricting the spread of disease.*

Keywords: *IoT, COVID-19, RBFN, Diabetes, KNN, Uniform Distribution.*

I. Introduction

Any object that can be connected to Internet refers to as "Thing" and a Thing can by any sensor or a smart device. The dynamic conditions of any object can be tracked by embedding an IoT device. This phenomenon encompasses a thing to fall under IoT[7]. The example devices are smart cards, laptops, desktops, smart phones, tablets, smart cards, cellular telephones and wearable computers. The limitations of mobile devices are low bandwidth, power consumption, security standards and transmission interferences. The full benefit of IoT can be achieved by interconnecting Internet of Things(IoT) with healthcare. Health care information systems are interoperable and we can increase its efficiency by interlinking with Internet of Things. The Healthcare IoT involves design and development of IoT devices to sense health parameters of diseases like diabetics. Automated IoT systems are designed for specific disease and will monitor the patient's conditions continuously. These devices assist in analyzing the conditions of patient precisely and accurately. The IoT systems can be developed with low cost and increased efficiency. The use of IoT based information systems is the current trend of health diagnostics. The health care systems are highly influenced by IoT devices as continuous monitoring of health parameters is being achieved with the integration of appropriate sensors.

As soon as the information is sensed, it is to be analyzed for decision making. The various types of wireless communications are mobile computing, ubiquitous computing and pervasive computing. Mobile computing involves communication of mobiles using mobile software like Android, IoS. Communication is done by establishing ad hoc networks with the mobile devices or any portable devices. Mobile communications must be *Portable* as it allows movement of objects, *Connectivity* to continuously connect with the mobile nodes, *Social Interactivity* to be Internet connected with the other users and *Individuality* that adapts the technology by the individuals that meets the individual requirement. Pervasive computing enables everyday objects to communicate effectively in all parts of our life. Ubiquitous computing is made by IoT to make available everywhere and anywhere. User can interact with computer either by laptops, tablets or any terminal like fridge or a TV. The IoT technology is widely used in tele medicine and health care, ever day things home appliances, security aspects like key chains, embedded mobiles, remote monitoring of home/office automation units, surveillance cameras, power supply management, retail appliances, M2M wireless networks, Vehicular Ad hoc Networks, Smart homes and Smart cities. Wireless data communications use Global System for Mobile Communications (GSM). GSM is a digital mobile network standard developed by European Telecommunication Standards Institute (ETSI). General Packet Radio Service (GPRS) allows continuous connection to Internet. W-CDMA is a 3G standard uses direct sequence CDMA channel access methods and Frequency Division Duplexing (FDD) for providing high speed data services. EDGE is faster than GSM and is designed to

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ANALYZING THE IMPACT OF CORONA SYMPTOMS USING CORRELATION

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Abstract: At the outset of Corona virus decease, it has created global health crisis and had a deep impact on day to day lives. Corona virus causes illness to both animals and humans. People suffering from this decease will face respiratory illness problem. The symptoms of corona decease include dry cough, respiratory problems and fever. Correlation analysis is widely used in medical industry to predict the cause of decease with the other health problems. The analytics on correlation is essential to observe the nature of inter dependency among the tied deceases. In order to identify the impact of this decease, the mutual relationship between the symptoms is evaluated using correlation analysis. Though safety measures put in place to stop spreading corona but still there are failures in adopting sustainable preventive mechanisms. The casual relationship between the symptoms is to be identified to diagnose the decease and the level of illness. In this paper, the correlation dependency between cold, flu, pneumonia and corona virus are analyzed using Pearson, Kendall's Tau and Spearman analysis. The baseline performance of the particular decease is cross verified with the results obtained from intuitions drawn from web to analyze the harness of the problem.

Keywords: COVID19, Pearson correlation analysis, Kendall's Tau, Spearman, Baseline performance, K-fold cross validation.

I INTRODUCTION

At present World Health Organization (WHO) declared Corona virus decease (COVID-19) as worldwide ongoing pandemic decease. COVID19 spreads through droplets of saliva, respiratory droplets expelled by infected people cough People already are suffering from diabetes or chronic respiratory decease experience severe illness with the corona virus.. Corona virus causes respiratory infections such as Middle East Respiratory Syndrome (MERS) and Severe Acute Respiratory Syndrome (SARS). The recent corona virus causes Corona Virus Decease 19(COVID19).Correlation is a statistical measure to find association between two continuous variables. Obtaining the correct correlation between two continuous variables depends on the type of the variable in study. Correlation coefficients are used to assess the direction of growth between two continuous variables. It will be necessary to statistically analyse quantitative data to test hypothesis of an outcome of the target variable. Pearson, Kendall's Tau and Spearman correlation analysis are very well suited formulation of inter dependency among the chosen variables. For assessment and diagnose a decease medical sciences use correlation coefficients to facilitate considerations of various associated symptoms. As Corona virus is spreading in fast pace, the outbreak of this situation alarms health emergency. Corona virus is the family of viruses and the transmission, prevention and spread became the topic of main concern. As a precautionary treatment World Health Organization (WHO) is conducting awareness campaign to outbreak the spread of the decease. The primary instructions include washing our hands, covering mouth and nose with tissue or mask. If somebody is suffering from cough, fever and difficulty in breathing immediate medical attention is advised. The problem of inter dependency of the above deceases is worth noting to check whether a particular person is corona virus effected or not. The effect of decease symptoms are statistically evaluated using correlation analysis. The baseline performance of the particular decease is cross verified with the results obtained from intuitions drawn from web.

II RELATED WORK

The symptoms of COVID-19 will be 64.29% with fever, 46.43% with expectoration 32.14% due to dry cough, 14.29% due to fatigue and 3.57% due to malaria. The suspected patients' pneumonia will be helpful for confirming COVID-19. Total proteins may be remedy to control COVID-19[1]. Restrictions need to be put on travel as there is widespread of disease. After imposing travel restrictions in 2020, corona is reduced in China. The model produced says, if the infection are moved to a new location, it increases by 50%[2]. Individuals are divided into four different classes and tested for virus infection. Symptoms and study of the disease symptoms

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Predicting Rise and Spread of COVID-19 Epidemic using Time Series Forecasting Models in Machine Learning

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ABSTRACT: The rapid spread of COVID-19 epidemic has attracted worldwide attentions since December, 2019. In this 21st century with most advanced technology available, we are not able to stop it. In this paper, we will study how the Machine Learning (ML) techniques are useful for analyzing and predicting the rise and spread of COVID-19. We study the rise of COVID-19cases in countries all over the world. We further aim to compare the spread of COVID-19 in selected countries and try to predict the possible cases up to date. We use the datasets available from John Hopkins University to study how accurately one can predict the rise with mathematical modeling. We use different Regression techniques, Time series forecasting techniques like Holt's model, ARIMA model to analyze on the rise and extent of the virus. The challenge in predicting the possible cases with traditional models is with high error value and is reduced by using Holt's, ARIMA models.

Keywords: COVID-19, Corona virus, Machine Learning, Linear Regression, Support Vector Machine, Time series, Holt's model, ARIMA model.

I. INTRODUCTION

At the completion of year 2019, a novel Corona Virus Disease 2019 (COVID-19) pneumonia arisen in the Wuhan, China [1-4]. On 24th January, 2020, Huang *et al.* explained the medical features of forty one patients with COVID-19. In this they specified the collective inception of indications which are - fever, cough, myalgia, or weakness. These had "pneumonia" and their chest CT inspection indicated irregularities. The impediments involved "acute respiratory distress syndrome, acute heart injury, and secondary infections". Among these patients, 13 were ICU, and 6 were died. For the first time the Kok-KH [5] team at the "University of Hong Kong" found the confirmation of human-to-human spread of COVID-19. This virus has initiated severe community health protection complications and later converted an international concern [6-8]. The severe situation puts onward new necessities for the stoppage and regulator plan. As a saying, "*always prevention is better than cure*" and it's time to "*stay home and stay safe*".

As the COVID-19 virus eruption continues to extent through the globe, enterprises and scholars are looking to use Machine Learning (ML) as a way of speaking the experiments of the virus. Computer experts and ML scholars all over the globe have been working together and functioning widely to discovery solutions to resolve problem slinked to the coronavirus. They are working on the datasets and preparing algorithms to study from the dataset. Even though, the statistical methods and procedures are available in the literature; the genuine intention for the explosion of ML techniques is because of data, higher system power, free software and structures. From industries like manufacturing and electricity to healthcare and learning, machine learning has modernized them.

In this paper we will analyze the rise and spread of COVID-19 virus in selected countries around the world. We use regression techniques such as linear regression, support vector machines and various time series predicting models to predict the rise and spread of this virus. The paper is organized as; the next chapter will be on machine learning techniques, section III on dataset used in the analysis, section IV covers the implementation of regression techniques. In the section V we compare the results and visualize the results and concluding remarks in the section VI.

II. MACHINE LEARNING

Machine learning is a data science method that explains computers to do what comes naturally to humans and animals: learning from knowledge. These procedures use computational techniques to "learn" information straight from data without trusting on a prearranged equation as a model. With the increase in the samples, the performance of the algorithms also increases.

A. Regression

Regression algorithms are mainly used in predictive modeling. It analyzes the relationship between the target variable and the predictor variable.

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Predicting Coronary Heart Disease: A Comparison between Machine Learning Models

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Abstract

Coronary Heart Disease (CHD) is most important reasons of death all around the world.An early recognition of this disease may help to reduce the death rate. This paper uses Machine Learning (ML) techniques on the pastmedical data to forecast CHD. This paperapplies and compares three Classification algorithms – Logistic Regression (LR), K Nearest Neighbors (KNN) and Decision Tree (DT). These ML techniques are validated with K Fold cross validationmodel to improve the correctness of the models. The results of performance evaluation metricsshowed that Decision Tree is performing better than the other two models.

Keywords *– Heart Disease, Machine Learning, Classification algorithms, Logistic Regression, K Nearest Neighbors, Decision Tree, Cross validation*

1. Introduction

Coronary Heart Disease (CHD) is one of the general heart diseases affecting people all around the world [1]. As per the statistics of the American Heart Association in 2016, 13% of deaths in the United States are because of CHD. A usual age at the first heart attack is approximately 67 years for males and for females it is 72 years. An American will have a heart attack in every 40 seconds approximately. Permitting to a study, during 2015 to 2030, medical expenses of CHD are estimated to rise by about 100% [2]. This shows that accurate prediction of heart disease is an important issue.

From last few years Machine Learning (ML) techniques are showing significant influence in the diagnosis of diseases[3-6]. Implementing an ML algorithm is a two-step process – Train the model and then Test it. During the Training the model, the input dataset consists of features and the outcome. And while testing this model, the dataset is given without the outcome [15]. The accuracy of the model depends on how accurately it is predicting over test dataset.

Rest of the paper is divided into four sections. Machine Learning models are discussed in Section 2. Section 3 will discuss on Data preprocessing – viz., understanding dataset, visualizations and metrics used to compare models. Section 4 implements the ML algorithms on the dataset. Section 5 compares the models concludes.

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Internet of Things Flood Prediction Architecture using Naive Bayes, Non- Linear Support Vector Machines (SVM) and Multi-Layer Perceptron (MLP) Classifiers

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Abstract

Disaster Management deals with awareness, response and recovery in emergency situations. Natural disasters like floods are difficult to predict as many uncertain attributes are needed to be analyzed. Prediction of Floods is however virtually impossible. Internets of Things (IoT) devices provide a way to monitor the affected areas regularly and measure its attributes for the prediction using sensors to sense real time. Many existing methods were applied in the flood prediction that has low scalability and efficiency in the forecasting. In this research, an IoT architecture is developed for monitoring the particular area and calculate its attributes for the prediction using machine learning techniques. The non-linear SVM analyzes the attribute and predicts the disaster effectively due to the Radial Basis Function (RBF) method. The uncertain attributes are analyzed effectively by the Naive Bayes and non-linear SVM for flood prediction. The prediction analysis is carried out using Naive Bayes, Non-Linear SVM, and MLP. The experimental result shows that the Naive Bayes model with the IoT structure method has a higher performance in the flood forecasting than other machine learning models.

Keywords: *Flood Forecasting, Internet of Things, Non-Linear SVM, Radial Basis Function, Naive Bayes and MLP.*

1. Introduction

The machine learning models are pretty much used in prediction analysis. Disaster prediction is a difficult process due to the presence of uncertain attributes related to the flood. This research aims to increase the performance of the disaster prediction using machine learning techniques like Naive Bayes, Non-linear SVM and MLP. The increase in the growth rate of IoT models increases day by day. The machine learning algorithms play a key role in prediction analysis for detecting this type of rare occurrences. The effect of flood causes damage to public and loss to Govt. financially. The precautionary measures and rescue activities should function effectively in saving the lives of victims and in reducing financial loss that occurred due to flood[2]. The Early Warning System(EWS)s gives great benefit in flood prediction. Flash methodology is the one in which the multi-model ensemble approach is used to estimate uncertainty in the soil moisture. This model is used for recent flood events. [3].Industrial monitoring needs alarm systems. The alarm system uses an online algorithm to match incoming alarm flood with the match in the existing dataset for time-stamped pattern matching. The dataset is taken from the real chemical plant[4]. The flash flood occurrence will be due to the change in soil conditions. The greenhouse effect emissions cause a change in the regional climate[5].With the problem of complexity in watersheds, the prediction of floods is done using simple and nonlinear models. Statistical models and decision making models are applied and derived promising results in Flood Susceptibility Mapping (FMS) [6]. The

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Microstructural and electrical properties of Mg substituted $Li_4Ti_5O_{12}$ synthesized by ceramic method

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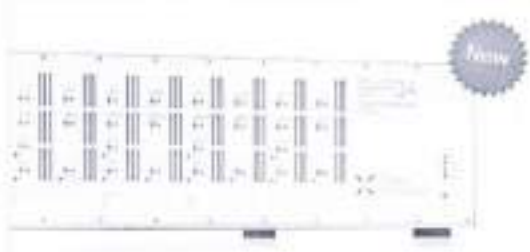

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Performance evaluation of noise coupling on Germanium based TSV filled material for future IC integration technique

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ABSTRACT

3D IC Integration shows the most emerging technology for future integration nodes which is now a most important trend for the semiconductor industries. Through-silicon-via (TSV) based integration is the prime technique to facilitate 3D IC integration without compromising the Moore's law. It is likely to usher the IC industries a paradigm shift from planar integration as it provides major benefits like improvement of system performance, power and enables heterogeneous integration. In this paper, we report Germanium/poly-germanium as an substitute material for Silicon/poly-silicon due to its superior carrier mobility. Mobility of electrons and holes in c-Silicon is 1500 cm^2/V-s and 450 cm^2/V-s respectively, where as in c-Germanium, the respective values are 3900 cm^2/V-s and 1900 cm^2/V-s. Therefore, considering these carrier mobility values we can envisage that poly germanium will be one of the ideal candidate towards realizing a high speed TSV interconnect when compared with poly-silicon. Nevertheless, even though copper is used widely to fill TSVs, it is also bereft of proper thermal expansion match with Silicon/dielectric (SiO_2). The coefficient of thermal expansion (CTE) of Cu (~17.5x 10^{-6} /°C) is many times more than of silicon (~2.5x 10^{-6}/°C). Hence, there will be heavy mismatch between Cu filled TSV and Silicon/SiO_2, and then it creates stress and strain between the interfaces. The CTE of germanium (5.8x 10–6/°C) is very close to Silicon, thus there CTE mismatch is very less, this fact is also an added advantage for Germanium to challenge copper as TSV material.

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1. Introduction

Semiconductor industries already reached to the extreme level of scaling due to physical limit of atomic level scaling to integrate millions of devices in a single IC. The main drawback is the planar integration (2D), which not only reduces the overall system performance but also raises the fabrication cost. Increase in functionality on a single IC makes the interconnection more stringent which in turn generates higher interconnect delay also limited the performance of IC. Also, it consumes more power which drastically reduces the overall system performance [1]. In order to keep an eye to extend the benefits of Moore's law, Three-dimensional (3D) IC is one of the premiere integration technique for future IC technology nodes. 3D Integration technology stacks various IC's vertically through electrical connections with the help of Through Silicon Vias (TSVs) and mechanically interconnected using bonding. Semiconductor industries get helped due to the shift in paradigm in interconnects by enabling advancement of integration vertically. It not only helps the industry to enhance the system performance but also helps them to enable the heterogeneous integration [2–5]. The heterogeneous integration helps the semiconductor industries to speed up the fabrication process more than 2 times. The prime

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Design of area-efficient high speed 4 × 4 Wallace tree multiplier using quantum-dot cellular automata

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ABSTRACT

Complementary metal oxide semiconductor (CMOS) devices are expected to face new challenges such as exponential current leakage, DIBL, hot carrier effects, and etc, at nano scale. Hence the CMOS technology is being supplanted by the nanotechnologies. Quantum-dot Cellular Automata (QCA) is key technology at nano scale which operates at tera hertz of speed. Comparing with the traditional CMOS technology, the QCA technology has low power consumption and high density. This technology also has a unique methodology such as "processing in wire" and "memory-in-motion". This work confers an area proficient, high speed full adder (FA) design with efficient clocking. The proposed full adder design comprises of 26 Quantum cells with delay of two clock phases, area occupancy of 0.03 μm^2. This paper utilizes the unique characteristics of QCA and the proposed Wallace tree multiplier is implemented with the mentioned FA and is designed by using QCA Designer 2.0.3 tool.

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1. Introduction

Because of the advancements in the VLSI technology, we need to design transistors having dimensions less than 32 nm [1]. The CMOS technology is concerned with the problems such as sub-threshold leakage currents, heat, lithography etc. Various alterative techniques have been developed by researchers that can anticipate the problems occurred with CMOS devices. Even the ITRS road map had recognized some novel technologies like Resonant Tunnelling Diodes (RTD), Single Electron Transistor (SET), QCA, and Carbon Nano Tubes (CNT), which could replace the traditional CMOS technology. According to ITRS, QCA is regarded as the prominent technology. It was proposed in 1993 by Lent et al. [2]. The Quantum cell is the basic unit of design in QCA. The Quantum cell is a square like nanostructure comprising of four dots arranged at its corners. In these two are electrons which are diagonal to each other due to columbic interactions. This technology operates by a phenomenon called Columbic repulsion.

Arithmetic operations play a crucial responsibility in economics, mercantile and many domains. Multipliers are considered as one of the most important computational block in signal processing. The studies proved that one of the effective ways to reduce the multiplication complexity is by the use of Wallace algorithm. This work confers an area proficient, high speed multiplier based on Wallace algorithm which is used to reduce the complexity, delay and cell count by using an innovative full adder suggested in the previous works [3].

The manuscript is further organised as follows. Segment 2 presents the basic concepts of QCA cells. Segment 3 introduces the clocking process in QCA technology. Segment 4 describes the wire crossings in QCA. Section 5 explains the basic gates' design using QCA. Section 6 introduces the proposed QCA one bit FA layout. Wallace tree algorithm is explained in segment 7. Segment 8 describes the proposed layout of Wallace tree using QCA. Results and discussion is done in Section 7.1. Section 8 gives the conclusion. The scope of this paper is to develop the commonly used multiplier architecture in an optimized area using novel nanotechnology like QCA.

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Content-Based Image Retrieval System Based on Fusion of Wavelet Transform, Texture and Shape Features

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CBIR, fast and accurate exponent fourier moments, local binary pattern (LBP), discrete wavelet transform (DWT)

ABSTRACT

In the last few years, Content-Based Image Retrieval (CBIR) has received wide attention. Compared to text-based image retrieval contents of the image are more in information for efficient retrieval by Content-Based Image Retrieval. The single feature cannot be applied to all the images and provides lower performance. In this paper, we have put forward a proposal on an image retrieval using multi-feature fusion. The concept of multi-resolution has been exploited with the help of a wavelet transform. This method combines Local Binary Pattern (LBP) with Fast and Accurate Exponent Fourier Moments (FAEFM's) with the wavelet decomposition of an image using multiple resolutions. In order to extract the feature of texture from image, LBP codes of Discrete Wavelet Transform (DWT), the image coefficients are estimated followed by the computation of Fast and Accurate Exponent Fourier Moments to these LBP codes so as to extract features of shape to construct the required feature vector. These constructed vectors aid us in exactly finding out and retrieving visually similar images from existing databases. The benchmark databases Corel-1k and Olivia 2688 are used to test the proposed method. The proposed method achieves 99.99% of precision and 93.15% of recall on Corel-1k database and 99.99% of precision and recall of 93.63% on Olivia-2688 database, which are higher than the existing methods.

1. INTRODUCTION

Rise in advances of multimedia and internet, a large quantity of multimedia information in image form, video form, and audio form has been made use of in different fields like satellite data, medical treatment, video still images and surveillance and security systems. This has initiated a massive demand for a system that can preserve and extract data in a better way. In order to satisfy these demands many multimedia information preserving and extracting systems have been developed. The most common retrieval systems are Text-Based Image Retrieval (TBIR) systems and Content-Based Image Retrieval (CBIR) systems [1]. A conventional TBIR scans the database for identical text data in and around the image as in query string. But extraction based on text suffers from certain disadvantages like expressing the whole visual content of images not being correct every time and limitless time consumption. This drawback can be overcome using Content-Based Image Retrieval Systems. A CBIR system makes use of the image's visual content presented as features at a lower level like color, texture, shape and spatial locations as representatives to images and the databases. The device extracts identical images after a sample image is given as input to the device. This way of investigation avoids the need for a description of images and words as visual data and is nearby the visual data's human perception. CBIR image features as a low level like color, texture, shape and spatial locations are presented as an n-dimensional feature vector. This vector of images in the database completes the formation of a database with features. The two categories of CBIR used for image features are local and global features. Color and texture come under local features. Color similarity of Color is obtained by computing a color histogram (CH) [2] for every image that describes the proportional part of pixels within the framework of the image holding specific values. Texture measures [3] look for visual patterns in images and the way of spatially defined. 'Shape', which is a globally accepted feature has been used as well for extraction in different ways.

An image is of complex structure and consisting of varying levels of details and it is not possible to extract the features by using a single resolution. Multi-resolution overcomes the problem of extracting the features from the complex image. The leftover un noticed features at one stage can be detected at another. This research work explores the mixture of shape and texture features [4] at more than one resolution of the image in order to get an effective and more than useful feature vector for image extraction by the advantages of multiple features. This variety of mixing processes is employed more than once at one scale of the image. Using wavelet multiresolution analysis is also explored by this research job Local Binary Pattern (LBP) and Fast and Accurate Exponent Fourier Moments (FAEFM's) extract the texture information and shape information respectively. With the help of Fast and Accurate Exponent Fourier components of LBP codes (this acts as a feature vector for extraction of images that are identical visually) we go for the computation of LBP codes of

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Synthesis, structural, dielectric and magnetic properties of cobalt ferrite nanomaterial prepared by sol-gel autocombustion technique

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Experimental studies on damping behaviour of nickel electroplated A356.2 alloy

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ABSTRACT

The present study mainly aspires for assessing the damping characteristics of the nickel electrodeposited A356.2 alloy. Surface modification of the base A356.2 alloy is carried out through nickel electrodeposition by employing a customary stirred watts bath. The damping behaviour of both nickel plated and un-plated aluminium alloy is studied using a dynamic mechanical analyzer (Perkin Elmer-DMA 8000) at three dissimilar frequencies viz. 1, 5 and 10 Hz over a continuous temperature oscillating from the ambient temperature to 150 °C. Nickel plating surface morphology is investigated by employing a scanning electron microscope (SEM) and X-ray diffraction (XRD) analysis. The nickel plated specimen's showcased elevated damping capacities irrespective to the increasing frequencies and temperatures in comparison with the un-plated alloy test specimens. The associated methodologies are reviewed.

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1. Introduction

Damping can be labelled as the energy dissipation process which is manifested during the mechanical vibration of structural elements and systems. For most practical applications the attenuation rate of elastic waves in a structure has a greater emphasis on the reduction of vibration, noise and reducing the fatigue failure. The past five decades witnessed the extensive research carried out in attenuating the vibrations. World war period has flaunted development of a huge variety of military equipment which aimed at reducing both external and internal vibrations. In recent time's vibration, noise emissions are mostly perceived as an environmental hazard. Therefore, the government has issued firm regulations on sound emissions, the federal aviation regulations (FAR) and joint aviation requirements (JAR) has implemented serious laws on aircraft sound emissions. Automobiles with lower NVH levels, electronic appliances with lower noise emission attained popularity in day to day situations. Materials with higher damping ability lessen the vibration and noise arising in a system [1]. Damping is of peculiar interest for designers and dynamists who are anxious with development and analysis of equipment which is intended to sustain in the mechanical environment [2]. Materials with satisfying damping and mechanical properties are utilized in marine, aerospace, automotive industries.

Extensive research is being carried out to explore low density and high damping materials. Therefore the damping characteristics of a material is to be considered equally important along with the other properties like toughness, stiffness, tensile strength, thermal conductivity etc. The very need for understanding and developing new-age alloy systems which display phenomenal damping characteristics and excellent mechanical properties is very essential. Aerospace, rotary engines, turbine blades, automobile components transmit lots of vibrations under cyclic loading which in turn causes fatigue failure of the individual systems. Aluminium alloys have found their way into automobile, aerospace and marine applications due to their low weight high strength stability, these aluminium metals are more prone to vibration loses[3].

Among the various cast aluminium types A356.2 aluminium alloy serves with some outstanding properties which enabled its utilization in automobile transmission cases, aircraft fuel pump components, aircraft fittings and engine control units, flywheel castings, nuclear energy installations. A356.2 aluminium alloy fits under the cluster of hypoeutectic Al-Si alloys. This A356.2 alloy is most commonly used in casting complex shapes. These castings display enhanced properties like acceptable high strength to low

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Exploiting Ensemble Learning for Rainfall Prediction using Meta Regressors and Meta Classifiers

Kovvuri N Bhargavi, G.Jaya Suma

Abstract: Intense rainfall produces flooding even on dry soil. As heavy rainfall is one of the causes for flooding it is necessary to predict the Rainfall to take necessary precautions for people who are living in risk zone areas. Prediction of Rainfall tomorrow is done accurately using Machine Learning regression and classification Techniques. For Rainfall prediction multiple attributes like Windspeed, Precipitation, Cloudcover, Humidity, Temperature and RainfallToday are considered to predict Rainfall Tomorrow. An ensemble approach is used where predictions from Regression models such as Linear Regression, Polynomial Regression, Ridge Regression and Lasso regression are stacked together and fed as new attributes to Meta Regressor along with Support Vector Regression for making final predictions. Also, predictions from classifications models such as Gaussian Naive Bayes, K-nearest neighbor, Support vector Machine and Random Forest are stacked together and fed as new attributes to Meta Classifier along with Logistic regression which is a binary classifier for higher predictive performance.

Keywords :Meta Regressor ,Meta Classifier, Support Vector Regressor, Random Forest, Ridge Regression, Lasso Regression.

I. INTRODUCTION

Flooding is due to continuous water flow towards land that is commonly dry. In case of heavy rainfall for longer durations mostly urban areas are affected with floods due to lack of drainage System. Floods in Urban areas are a great trouble to the individuals in the city. People cannot go to their work as roads, streets get blocked. Flash floods are caused to Heavy Rainfall within a short period of time results with harmful and unpredictable destruction. Drinking water is contaminated due to floods results in spreading of water-borne and vector-borne communicable diseases. Floods are caused by different reasons, one of the chances for flooding is heavy rainfall. Finding Flood prone areas, identifying the cause of flooding and educating people in nearby areas helps from being affected. Various Machine learning algorithms are used to accurately predict the rainfall in advance based on the atmospheric attributes. If the rainfall is predicted in advance the flood intensity will be reduced by taking necessary precautions. Machine Learning Algorithms models are trained and tested to get accurate predictions. Accuracy of different Machine Learning Regression and classification are combined using Ensemble stacking Meta Classifier and Meta Regressor for accurate Rainfall Prediction.

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II. LITERATURE

JoRefonaa proposed a rainfall forecast model using linear regression. Rainfall Prediction is difficult to forecast as atmosphere changes are dynamic. By considering historical records of a geographical area rainfall prediction proves to be more reliable showing good accuracy.[1]
Brett W Robertson proposed a model which analyses the Social media information gathered for real time disaster. urgency and time period of social media images are classified using deep learning Convolution Neural network and Multilayer Perceptron neural networks.[2]. Sagnik Proposed methodology by considering the mean day by day Gauge heights, mean day by day precipitation, and the mean day by day river discharge values to estimate4 days ahead of time. These attributes are fed as input to extreme learning machine regression model for mean gauge height Prediction.[3].The quantity of units in the ELM was improved to acquire the most extreme coefficient of assurance utilizing the molecule swarm advancement calculation (PSO) to develop ELM-PSO model .Dieu Tien proposed a flash flood prediction model with deep learning neural network approach. High frequency tropical storm area case study is discussed [4]. Rahul Proposed a Prediction model for Natural Calamities Detection by combining convolution neural network and SVM. Natural disasters like tsunami, cyclone, earthquake, volcano eruption, wild fire, landslide datasets are taken as input for classification.[5]
Kishan Kumar proposed house hold analysis affected due to floods based on the flood data in several districts of Bangladesh. Machine learning techniques are used for prediction and influencing factors for conducting flood reduction programs. Analysis shows important factors for flood prediction and Principle component Analysis is applied to predictors and analyze their effect on flood damage.[6] Amir Mosavi introduces Hybridizing of existing novel machine learning models for finding more accurate and predictive models.[7] Jiansheng proposed a hybrid optimization strategy genetic algorithm for better accuracy of rainfall prediction.[8] Andrew Kusiak performed analysis using data mining predictive models support vectors, random forest, neural networks, K-nearest neighbors, regression tree and Random Forest for rainfall prediction.[9] Jeema applied machine learning algorithms for pluvial flood forecasting which is a rare disaster with small duration resulting high impact in in urban areas. Upstream and downstream of Puttuni river are tested using Bayesian Linear model.[10] Ajay Kumar proposes Back propagation NN and Radial basis NN are widely used for rainfall prediction. Radial functions parameters are very complex and sensitive to over-fitting.

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Investigation of numerical modelling of TIG welding of austenitic stainless steel (304L)

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ABSTRACT

Welding is one of the most commonly joining processes used in industry at widespread. Austenitic stainless steel are application in fabrication pressure vessels. Thin sheets of 304L can be welded by pulsed Tungsten Inert Gas (TIG) joining process. The current study investigates the numerical modelling of pulsed TIG welding of austenitic stainless steel using ANSY APDL. Double ellipsoidal heat source have been used for modelling the pulsed TIG welding. The objective of the present investigation is to study the effect of varying welding current on the temperature distribution curve. Temperature profile affects the microstructure, mechanical properties and the residual stresses developed in the welded joint during TIG welding. It has been observed that the peak temperature increases with increasing welding current.

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1. Introduction

Welding is a method of fusion of two comparable or non-comparable metals, with or without pressure application and with or without filler metal use. Weldability of the material relies on multiple variables such as metallurgical modifications resulting from welding, changes in material hardness, in and around the weld, and the magnitude of the joint's cracking inclination. Single or mixture of variables such as stress, heat and filler material used have been used to develop a variety of welding procedures so far. TIG welding is one of the most widely used joining process.

Many researchers have explored the welding of austenitic stainless steel. Lindgren et al. [1] studied the finite element method to predict the thermal and mechanical properties of the welded joints. They studied the Computational Welding Mechanics (CWM) which is commonly used numerical approach and reviewed modelling problems in heat input and material behaviour. Lu et al. [2] studied the effect of deformation between the welding arc and weld pool using numerical simulation approach. They calculated the weld pool shape using dynamic coupling of welding arc and pool. Faraji et al. [3] studied the three dimensional numerical model using finite volume method for the simulation of heat transfer and fluid flow in hybrid TIG - laser welding. They observed that the hybrid welding results similar weld pool compared to laser welding process which is formed due to high heat input from the combination of TIG and laser heat. Kumar et al. [4] explored the numerical simulation of temperature distribution in laser welding of carbon steel St 37 to predict weld geometry and heating and cooling curve and validated the numerical results with good agreement. Dong et al. [5] studied the effect of active element oxygen and GTAW welding parameters namely speed, current and electrode gap on weld shape using a numerical approach. They observed that with low oxygen, low welding speed, welding current or small electrode gap will produce more welding D/W ratio. Gao et al. [6] studied the comparative analysis for joining of Ti6Al4V titanium alloy using Nd:YAG laser and TIG welding. They compared the residual distortion, weld pool geometry and mechanical properties of the two joining processes. They found that the LBW joining process has more strength of the weldment than TIG welding with higher ductility. Kumar et al. [7] investigated temperature distribution in laser welding of 304L austenitic stainless steel. They studied the effect of laser welding process parameters, namely, average beam power, welding speed, and laser spot diameter on weld bead geometry have been studied. Kumar et al. [8] studied a three-dimensional numerical model for the simulation of temperature profile and temperature gradient in similar and dissimilar laser welding of 304L and St37. Mousavi

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Study of microstructure and mechanical properties of aluminium alloy (AA-6351-T6) using friction stir welding

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ABSTRACT

The current study investigates the effect of welding speed on the mechanical and microstructural properties in similar friction stir welding of Aluminium Alloy (AA-6351-T6). The contribution of intense plastic deformation and high-temperature exposure within the stirred zone during friction stir welding results in recrystallization and development of texture within the stirred zone and precipitate dissolution and coarsening within and around the stirred zone. Based on micro-structural characterization of grains and precipitates, three distinct zones, stirred (nugget) zone, thermo-mechanically affected zone (TMAZ), and heat-affected zone (HAZ).The micro-structural changes in various zones have significant effect on post weld mechanical properties.

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1. Introduction

Friction stir welding is a solid-state joining process that uses a third body ("tool") to produce the friction welded joint. Friction stir welding also employs frictional heat to plasticize the material, however, material consolidation significantly differs from the friction welding methods described above. It creates high-quality, high-strength joints with low distortion. Seam welds can be placed on either butt or overlapping joints, in a wide range of material types and thicknesses. Friction stir welding was invented by Wayne Thomas in 1991 and overcomes many of the problems associated with the traditional joining techniques. It is a joining process which is particularly suited for aluminum alloys. Consequently, this joining method has gained significant interest within the automotive industry.

Many researchers have worked in field of friction stir welding (FSW) for aluminum alloys. Hu, Z. L. et al. [1] explored the microstructural and mechanical properties of FSW joint during plastic forming and subsequent heat treatment were investigated. The microstructural characteristics of the friction stir welding joints were studied by Electron Backscattered diffraction and Transmission Electron Microscopy. The mechanical properties were evaluated by tensile and micro hardness tests. It is found that the tensile and yield strengths of friction stir welding joints are significantly improved after severe plastic deformation due to the grain refinement. Dalu et al. [2] studied the effect of various process parameters on quality of the welded joint. They reviewed the effect of various process parameters, such as tool rotational speed, traverse speed, axial force and tool geometry on the quality of the welded joint. Melendez et al. [3] explored the method for measuring the various forces and the torque which forms in the FSW pin tool. They also explored the results for various plunge depths, weld speeds, rotational speed, and tool configurations. Kumar et al. [4] studied a three-dimensional numerical model for the simulation of temperature profile and temperature gradient in similar and dissimilar laser welding of 304L and St37. McQueen et al. [5] studied the microstructure and mechanical properties of a FSW AA6056-T6 and studied the microstructure and mechanical properties using optical and (TEM) transmission electron microscopy techniques. They observed grain morphologies in the thermo-mechanically affected zones (TMAZ) in the weldment and also observed fairly elongated grains in the advancing side and bent grains in the retreating side.

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Full Length Article

Performance and emission characteristics of variable compression ratio CI engine fueled with dual biodiesel blends of Rapeseed and Mahua

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ABSTRACT

This paper demonstrates the performance and emission characteristics of a variable compression ratio diesel engine (VCRDE) with the dual biodiesel. The dual biodiesel used is a blend of Rapeseed (RA) and Mahua biodiesel (MU) in equal proportion by volume. The experiment is conducted under different load conditions with constant engine speed of 1500 rpm. The biodiesels used here are prepared by transesterification process and formed one new biodiesel (RM) with mixing of Rapeseed biodiesel and Mahua biodiesel by equal volume (1:1). The performance test is done for 100% RA, 100% MU and different RM blends such as BL20, BL40, BL60 and BL80, along with diesel. The obtained results have shown that, the blend BL20 gave the best performance and is closest to diesel fuel. Further, based on the experimental results the brake thermal efficiency of the blend BL20 was found to be 2.79% lesser than diesel fuel. Also, the emission characteristics of BL20 such as CO, HC and smoke at full load conditions were 20.66%, 8.56% and 6.9% lesser than diesel respectively. On the other hand, the NO_x emission was obtained slightly higher than the diesel fuel by 3.77%.The outcomes of this paper corroborate that, without any modification in engine, the blend BL20 can be used as an alternate fuel for the diesel.

1. Introduction

With the rapid depletion of world petroleum reserves and increased demand of petroleum products, especially of transportation fuels, it has become necessary for all the nations to search for alternative liquid fuels. Particularly, the automobile industries have a huge demand of non-renewable energy sources. In automobile industry, diesel is one of the major fossil fuels (non-renewable source) and its combustion puts negative impact on the environment. Owing to the fast and rapid exhaustion of fossil fuels, the requirement of alternative sources of fuel is very much necessary. There are many alternative or renewable sources, which can be used as biodiesel fuel after certain treatments, such as vegetable oils, producer gas, alcohols and biomass. Among these, vegetable oil can be treated as distinctive renewable source for making the biodiesel because of various advantages such as easily available, non-hazardous and bio degradable character, which will not only be cost effective but also environmental friendly. The usage of biodiesel (edible and non-edible) as an engine fuel getting much more attention in both academic and industrial sector, therefore, many researcher and scientist are focusing the work on the application of biodiesel as an engine fuel. In recent times, the research on biodiesel has increased and many researchers advocated that vegetable oil can be used as an appropriate replacement of conventional diesel fuel. In addition to that, vegetable oils are much environmental friendly over the conventional diesel by emitting less carbon gases. Saravanan et al. [1] have reviewed the national biofuel policy of India that helps in regulating the biofuels production and the marketing.

Haas et al. [2] have conducted experimentation on a 4 stroke DE using soybean soapstock biodiesel and reported that petroleum diesel and soybean soapstock biodiesel blend in 80:20 proportions by volume has given reduction in hydrocarbon, particulate matter, and carbon monoxide by 27.7%, 19.7%, and 2.4%, respectively in comparison with petroleum diesel alone. Bhupendra et al. [3] have emphasized on the use of non-edible Jatropha oil as biodiesel and presented the engine performance, change in emission & combustion characteristics. Hifjur Raheman et al. [4] have observed a better combustion and 21% lesser soot deposits by 10% blend (B10) of Mahua and simarouba oils (50:50) with high speed diesel. Orkun Ozener et al. [5] have found out that by using a blend of B10, B20, and B50 of soyabean oil, there is a reduction in CO emission & HC emissions. They used these blends on a variable speed engine single cylinder direct injection DE.

Solaimuthu and Govindarajan [6] have used blends of Mahua

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Chunk by Chunk Irrigation of Farm Field -Through Wireless Sensing Technique

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Abstract: *Farming act as a heart to Indian economy and is a work of farmers. Farmers pursue certain set of stages to farm a field and irrigation is essential stage among all stages. Farmers are using so many irrigation methods to farm a field and the Irrigation methods must be in such way that, it have to boost plant development while minimizing salt inequities, leaf injuries, soil erosion, and water loss. To get good results in irrigation we should use good irrigation system. Now a days, farmers are using so many irrigation systems to pump water on the farm like traditional, modern and automated methods. Even though farmers facing problems like current shocks, standing long time and monitoring each and everything to pump water on the entire farm. In this paper modernistic sensor-based water pumping system is proposed to made irrigation easy to the farmers by chunk by chunk irrigation and each chunk is supervised with the help of soil moisture, temperate and humidity sensors. One more criteria, farmer need to concentrate while selecting an irrigation method is power supply, especially in Andhra Pradesh there is a regular power cuts in the nights.so that farmers can't go every time to monitor how the irrigation is in the nights. Because in the nights snack and poisonous insects will be there in farm field, so it will be dangerous to the farmer's life.so, by using proposed irrigation method irrigation will be easy in regular power cut areas, sloppy area and irrigation at night time.one more benefit from this proposed method is man power will decrease.*

Keywords: *Farming, Irrigation, Sensor, Power-cuts.*

I. INTRODUCTION

In every country, Farming is the Prime area of economy and farming makes straight usage of natural resources. Farming sector is key to less industrialized nations and fewer importance in countries which have good industrialization. Till industrialization, most people worked in farming. Before industry revolution most of the human beings worked as farmers and farmers cultivate maximum of their crops for their personal eating instead of buying. Currently, farming sector is the biggest income provider in India and is work of people we lived in rural areas of a country. And farming also play an important role to figure out the GDP of country. Maximum industries also use farming sector for raw materials. Over the past century a extraordinary alterations happened in farming practices as a result of the development of world market and improved technologies in farming sector [1].

In this farming sector farmer play a key role. Every human being eating food three times a day because of farmer only. Here farmer will follow some step like selection of crop, preparation of land, selection of seeds, sowing, irrigation, growth of a crop, fertilizing and lastly harvesting to cultivate the crop.in these all step one most important step is irrigation. Proper irrigation of farm field will result in good crop.so, we should select good irrigation method to get good results in farming in all aspects. And we need to consider the following thing before selecting irrigation method [2][3][4]

1. Manpower should reduce
2. Safe night time irrigation of farm field(to save farmer life from snacks and dangerous insects)
3. Based on crop type and season, irrigation should be done
4. SMS to information about irrigation work to the farmer to monitor from home itself

In this paper an automated method called "Chunk by Chunk Irrigation of Farm Field -Through Wireless Sensing Technique" is proposed which will act as good irrigation system by considering above things.

II. LITERATURE SURVEY

Here, a method is developed which will be better when compare with the following methods which are already in use with respect of man power reduction and save farmer life in night time while irrigation from snacks and poisonous insects.

A. Irrigation using traditional approaches

Pulley system, Chain Pump, Dhekli and Rahat are treated as traditional methods of Irrigation. These methods require animal or human labor to function. The first one is Moat, it contains drawing up water from a well to wet the farm field. Moat approach is cost effective and it consumes time and wastage of water will be avoided with this approach. And the next one is pump chain, this approach comprises of big dual wheels attached with a chain. For chain, buckets will be attached. On side of the chain is dints into water. When wheels will rotate, Water will pick up from the water source with the help of bucket and pour water into a source. And third one is Dhekli, in this method a rope and bucket will be tie to a pole and on the other side of a pole counter balance (it may be any heavy object) will be tied. And we use this to take out water.

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ENHANCING CLINICAL DECISION SUPPORT SYSTEMS USING SUPERVISED LEARNING METHODS

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ABSTRACT:

Machine Learning is a subdomain of Computer Science and it is a raising field. The use of machine learning applications related to health is briskly increasing and may the potential to dearly affect the field of healthcare. Healthcare industry is already overburdened with the exploding population and lack of trained doctors. The spontaneous healthcare providers are not available in marketing. Machine learning is widely used in healthcare and it can enhance to provide effective diagnosis solutions. In this paper we mainly focus on how supervised learning models are helpful to the healthcare industry. Supervised learning models are used to predict the outcome based continuous data and is knows as supervised regression learning. Supervised learning in healthcare help users to perceive understanding about the potency of existing programs and identify the treatment that provides best result for patients according to their condition. These supervised learning methods have made advances in healthcare domain. These supervised learning methods will help to serve for more patients in a less time and also improve healthcare outcomes and reduces the healthcare expenses.

KEYWORDS: Machine learning, Supervised learning, Unsupervised learning, Healthcare Industry, diagnosis, clinical workflows, Clinical decision support systems.

I. INTRODUCTION

Healthcare industry has the broad scope to provide health services for patients. It has never faced such a massive amounts of electronic data such a sharp growth rate of data today. There is no appropriate technique is designed to find great economic values from large amount of healthcare data. The data has become meaningless and also required the large amount of space for storing and manage. Data mining techniques are imposed for predicting the behaviors and future trends which can convert stored data into meaningful information. These data mining techniques are helpful for providing decision support in healthcare system and it is also helpful to speed up the diagnosis time and improving the diagnosis accuracy. Healthcare industry should workable to provide much cheaper and faster way of diagnosis. Clinical decision support systems with various data mining are being applied to assist physicians in diagnosing patient diseases.

Clinical decision support systems are designed to assist physicians at the point of care in making clinical decisions. Clinical decision

Performance Analysis of Grid Synchronization Method for Three- Phase Three-Wire Networks under Grid Fault Conditions

Article in Waffen und Kostumkunde · December 2020

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Research Article

Design of Baugh–Wooley multiplier in quantum-dot cellular automata using a novel 1-bit full adder with power dissipation analysis

A. Arunkumar Gudivada[1] · Gnanou Florence Sudha[1]

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Abstract
Complementary metal oxide semiconductor (CMOS) is a low-power technology typically used in the efficient implementation of digital circuits. However, at nanodimensions, CMOS has problems due to its short channel effects and subthreshold leakage currents. These drawbacks can be overcome with quantum-dot cellular automata (QCA) which is one of the fastest nanotechnologies operated at THz rate. Thus, all digital circuits can now be implemented by QCA at the required nanoscale. This paper proposes a novel, energy-efficient and area-optimized 1-bit full adder design using QCA which provides efficient clocking, reduced cell count and reduced energy dissipation. The proposed design utilizes only 26 quantum cells in 0.02 μm^2 area and has a reduction of 8% in number of cells, 75% in delay and 4% in energy dissipation at 1 K compared to the existing works. This innovative full adder design is used to implement a 4 × 4 Baugh–Wooley multiplier. The simulation results of the multiplier observed on QCADesigner 2.0.3 tool validate that the Baugh–Wooley multiplier designed with the novel 1-bit full adder yields better performance in terms of 9% reduction in area, 17.4% reduction in quantum cells used and reduced power dissipation of 2.44nW.

Keywords Quantum-dot cellular automata · 1-bit full adder · Baugh–Wooley Multiplier · Power dissipation

1 Introduction

Scaling of MOS transistors leads to several problems such as short channel effects, quantum effects, leakage currents, lithography and fabrication issues [1]. Therefore, it is envisaged that Moore's law cannot be continued for future technologies. Quantum-dot cellular automata (QCA) is a promising transistor-less nanotechnology which is predicted to supplant the current CMOS technology. QCA is a nanotechnology which was proposed in 1993 by C.S. Lent et al. [1]. Later, the first fabrication took place in the year 1997. Quantum cell is the fundamental element of QCA. The quantum cell is square in shape and has four dots arranged at its corners. It also contains two electrons. Due to the electrostatic interactions, these two electrons exhibit two polarizations characterizing the two binary states, logic 0 and logic 1. As a result, all digital circuits can be developed by quantum layouts as shown in [2]. Thus, QCA provide a groundbreaking solution to nanoscale computation, which opens up a new outlook on circuit design.

In any computer arithmetic computation such as addition, subtraction or multiplication, the adder plays a very important role. Consequently, for the design of high-performance arithmetic circuits, an efficient adder is necessary. This paper introduces an energy-efficient and area-optimized 1-bit full adder design in QCA which effectively brings down the number of quantum cells, area and energy dissipation. Further, to demonstrate the efficiency of the proposed full adder design, the Baugh–Wooley multiplication algorithm has been implemented using the proposed 1-bit full adder and its performance has been

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PI and Fuzzy Controller Utilizing PV-HESS Based Zeta Converter for BLDC Motor Drive

B. Rajani, G. Seshadri, T. Anil Kumar, V. Chandra Jagan Mohan

Abstract: ***Due to speedy enfeeblement of finite resources in the early modern period of development, non conventional resources of energy, are being focused in various countries to reach the growing demand of electrical energy. Increased importance of non conventional energy in the auto mobile industry needs the use of brushless DC (BLDC) motor drives to fuel solar photo voltaic (PV). To overcome the disadvantages in the conservative DC-DC converters, Zeta converters are enterprising to optimize power processing. By regulating the duty cycle of the Zeta converter through particle swam optimization (PSO) we obtain the maximum power from PV array. To mitigate changes in output of PV, the Hybrid Energy Storage System (HESS) is implemented into the PV system to maintain a continuous voltage at the BLDC motor input. The robust power management algorithm controls the PV-HESS system .By keeping the power management of maximum power point tracking the Zeta converter can meet the trouble free performance of the system. The interpretation of the BLDC motor with zeta converter relic verified using proportional integral(pi) and fuzzy logic(FL) controller. Design method and parametric analysis is carried out in MATLAB simulation and results are validated.***

Keywords: ***Brushless DC motor (BLDC), Fuzzy logic(FL), Hybrid energy storage system(HESS), maximum power point (MPP), Proportional integral (PI),Solar Photo voltaic (SPV).***

I. INTRODUCTION

Electrical vitality acts as mainstay in a present day modernized life . The spread of world's power demand grabs interest in exploration of valuable usage of non-conventional energy sources. Solar power is promising out of all non-conventional energy sources, as it is environmental friendly & clean. Solar energy is inexhaustible and available from the sun with free of cost. The transformation of sunlight into electricity is solar power. Electricity plays a vital role in our day to day life.

Solar power is created from sunlight and it is abundant, so the heat acquired by the receiver is utilized as electricity for the functioning of various activities. As the solar energy is occurring at irregular intervals, MPPT of PV module changes with the deviations of solar irradiance, in order to enhance the effectiveness of the solar power system it needs the MPP tracking point.

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Therefore, MPP tracking is an required part of PV system to make sure that the power converters operate at the MPP of the solar array.

Persistent work is continuing in the development of MPPT innovations [2] to conquer disadvantages of previous algorithms. PSO algorithm for MPPT calculation is a proficient MPPT methods[3] for finest grabing of largest power from PV array. This method can track global MPP instead of having multiple peaks.

To order to keep steady supply sunlight based PV array needs backup like energy storage system, one of its kind is HESS which is a combination of super capacitor and battery. The battery provides backup in steady-state whereas super capacitor acts as a tailback for transient situations .

The HESS can be discharged or charged via a two-way buck-boost type converter to increase the voltage of a PV array. Based on power management algorithm, switching pulses for the bidirectional converter will be obtained. The zeta converter regard to a buck-boost converter group serving as a non-inverting buck-boost converter which is close to solar PV array to clip upmost solar power.

II. SCHEMATIC DIAGRAM

SPV-HESS fed BLDC motor with PSO-based MPP tracking algorithm using Zeta converter is displayed in Figure 1. SPV systems are the primary basis for BLDC motor drives and HESS will be used as a backup to accord with periodic circumstances due to changes in environmental conditions. The change of Zeta converter is arranged with pulses generated by the PSO based MPP tracking controller. The system's power management will be performed by the battery and super capacitor under different environmental conditions.

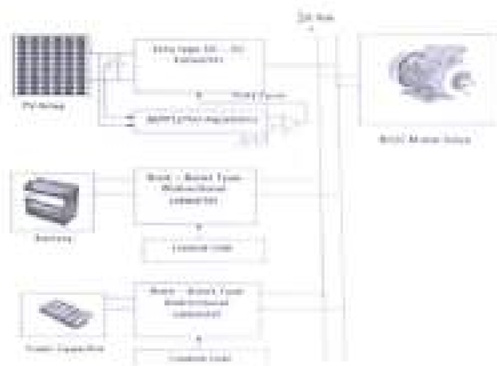

Fig.1: SPV-HESS fed BLDC motor drive

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Optimal Conductor selection and Capacitor Placement for Cost minimization in Distribution Systems

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Abstract

In this paper conductor selection and capacitor placement is done optimally to minimize system cost. Optimization problem is solved using Harmony search algorithm (HSA) with cost minimization as objective and maximum conductor current capacity as constraints. Both annual energy loss cost and annual capital investment cost for conductors and capacitors are considered for analysis. The proposed approach is implemented on an 85-bus system and results are presented. Results proved that selection of optimal conductor sizes and capacitors simultaneously for the network resulted in reduced losses, cost and improved voltage profile.

Keywords: *Conductor selection, Capacitor placement, Harmony search algorithm, Cost minimization.*

1. Introduction

Huge distribution losses and poor voltage profile is a major problem for power distribution systems as they force the distribution companies to incur heavy financial loss. Several loss reduction techniques such as reconfiguration, conductor selection, capacitor placement and distributed generation placement can be employed in the system. Among these conductor selection and capacitor placement are very popular owing to their effectiveness in improving the performance of distribution systems. Placing shunt capacitor of optimal sizes at appropriate locations and choosing optimally the conductor sizes for the branches could result in reduced losses and improved voltage profile.

Adel Ali et al. [1] employed loss sensitivity indices to find capacitor locations and Ant Colony optimization algorithm to find optimal capacitor sizes in order to minimize losses and cost. Askarzadeh [2] made use of Crow Search algorithm (CSA) to solve optimal capacitor allocation problem considering cost minimization as objective. Plant growth search algorithm is used for capacitor placement for loss reduction and voltage profile improvement [3]. Ranjan et al. [4] used an evolutionary programming technique to optimally allocate capacitors in distribution systems with an objective to minimize energy loss cost and investment cost. Raju et al. [5] developed a heuristic algorithm for optimal capacitor placement in a agricultural feeder to minimize system cost. Rao et al. [6] used Harmony search algorithm with differential operator (HSDE) to solve optimal capacitor allocation problem to minimize cost. Abdelaziz and Ahmed [7] used CSA and Sherif at al. [8] used Grass hopper algorithm to optimally allocate capacitors to minimize operating cost and investment cost of system. In this work optimal conductor selection and capacitor placement is done simultaneously to maximize the both technical and economical benefits. The paper is structured as follows: Section II discusses problem formulation, HSA and proposed approach of simultaneous optimal capacitor placement and conductor selection, Section III presents results, and Section IV outlines conclusions.

2. Problem Formulation

A. Mathematical model

Objective function for optimal conductor and capacitor selection in a radial distribution system is given as

$$\text{Cost} = \text{minimize}\,(C_f + C_{kf})$$

$$C_f = C_{f,con} + C_{f,cap}$$

Digitalized Synchronization of Multi level STATCOM with Switch Fault Elimination

K.Varalakshmi, R.L.Narasimham, G.Tulasiramdas

Abstract: *With much advancement in the FACTS technologies STATCOM with multi-level inverter provides reactive compensation with less harmonics injection in the grid system. The voltage stress on each power electronic switch is also reduced as the voltage across each switch is low, in turn reduces the switching losses. In this paper a cascaded multi-level inverter with STATCOM application of 2m+1 levels controlling through Space Vector PWM was considered. Switch fault analysis is carried out by detecting and mitigating the fault with a bypass power electronic switch. Design method and parametric analysis is carried out in MATLAB simulation and results arevalidated.*

Keywords—STATCOM- *Static Synchronous Compensator,Switch Fault Analysis, SVPWM- Space Vector Pulse Width Modulation, Harmonic Reduction .*

I. INTRODUCTION

Among all the FACTS devices in the power systems the STATCOM is the most accepted compensating device to ensure power quality in the grid system. With several advancements in the technology of the control system the efficiency and also the Reliability has been increased for these devices. Modification of simple VSI (Voltage Source Inverter) with a three level PWM operation to a multi-levelPWM (Pulse Width Modulation) output from a Cascaded H-bridge inverter may decrease the harmonic content injected by the STATCOMin the grid and also reduces the stress on the power electronic switches during the operation at higher voltages which in turn reduces switching losses in the device.

In the proposed methodology, we consider a thirteen level Voltage source inverter with six cascaded H-bridges [1] and space vector PWM technique to control the IGBTs (Insulated Gate Bipolar Transistors). Three phase pulses are produced to operate the bridge with an angle difference of 120 degrees to each other. High voltage operations with larger levels increase the number of switches connected to the system which also create vulnerability of the switches to open circuit and short circuit faults during the operation.

The number of switches used in a 13 level cascaded H-bridge are 4x6 = 24 IGBTs in each phase. So, it is very important to make sure the detection and mitigation of these faults in the switches with a sophisticated control system and ensure the protection of the grid connected devices from these disruptive failures of switches in the STATCOM.

A model of 13-level cascaded H-bridge with six cells connected in series shown in Fig.1.

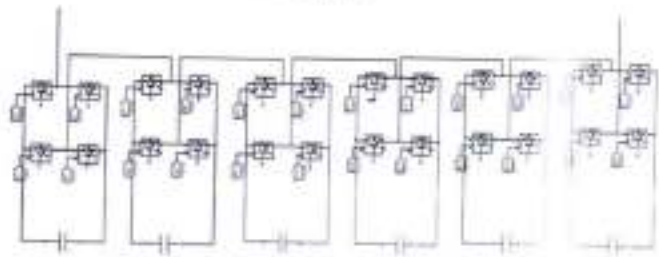

Fig. 1: 13-level cascaded H-bridge

Each cell consisting of four IGBT switches with anti-parallel diode to avoid circulating current in the system during the operation. Each cell has a high rating capacitor on the DC side, to which the charge and discharge conditions are controlled by the SVPWM (Space Vector Pulse Width Modulation) technique applied to the switches.

II. MULTILEVEL SPACE VECTOR PULSE WIDTH MODULATION TECHNIQUE

Among several PWM techniques [2] the SVPWM technique is the most advanced and reliable method for the inverting operations. The digitalized control of the switches makes the system accurate with precise switching state conditions. However the basic sinusoidal PWM technique is simpler than the SVPWM, but the peak output voltage of the inverter is limited to half of the input DC voltage. In the SVPWM technique the sampling control signals are generated at regular intervals of time with better harmonic performance and converter output voltage of the inverter is 15% more than the SPWM technique [3]. The SVPWM has a complicated control where the required sector (1 to 6) has to be identified and selected for the required output voltage andthe AC side.The SVPWM control signals are formed by the sinusoidal signals with the offset voltage generation with the given relation.

$$V_{offset} = -(V_{max}+V_{min})/2 \quad (1)$$

The space vector control [7] diagram in MATLAB Simulink modelling is shown in figure 2. -The output signals are passed through a gain of $2/\sqrt{3}$ to increase the output reference value from 0.866 to 1 and maintain the modulation index as 1.

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SMART BASKET ALGORITHMIC APPROACH FOR SHOPPING IN SUPER MARKETS USING RECHARGEABLE SMART CARD

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Abstract: Nowadays, shopping has become part and parcel of every individual's life. As technology is rapidly moving through new innovations the life of the people is going to be easier and faster in their daily activities. "Smart shopping basket for supermarkets with rechargeable smart card" is discussed in this paper to help customers reduce their time of shopping. The proposed system's objective is to provide the customers an efficient system and easily handled shopping basket to make shopping easier without wasting their time. Every product is attached with a RFID tag. When a product is placed in the smart basket by the customer, the RFID Reader reads the Product ID from RFID tag and retrieves the information of the product from the microcontroller of Arduino Nano. The list of products purchased along with the invoice of the bill generated is visible to the user on the LCD display. It makes the process of shopping faster by eliminating the traditional way of scanning the barcode of the products at the check-out counter. Also with this model the customer can plan his shopping with the budget available in the card only by purchasing essential commodities and thus can improve his savings. When shopping is completed the customer can press the end button such that the bill details will be messaged to registered mobile number of user by connecting arduino with GSM. With the proposed model the customer has to carry a smart rechargeable RFID card, which is to be scanned at RFID reader to pay the bill. After reading the smart card through RFID reader the amount of bill generated will be deducted from the balance of the smart card which is pre recharged. The payment is done after shopping is completed at the basket itself and the payment details along with remaining balance in the card will be communicated to the customer thus avoiding the long queues and wasting of time at the bill counter. The payment made by the customer is authenticated just by checking the message received by the customer at the check-out counter.

***IndexTerms*- Arduino Nano, RFID reader, Smart RFID Card, LCD Display, Buzzer, GSM Module, Smartbasket Algorithm.**

I. INTRODUCTION

A supermarket offers a wide variety of groceries, house hold products, food and beverages organized into sections. The numbers of little and enormous supermarkets are increasing day by day throughout the world to the satisfaction of general public. When our supermarket system is compared with other foreign countries, there are some gaps to be filled for improvement in order to provide a quality experience of shopping to customers. During shopping often the customers face inconvenience and problems. These problems may include insufficient information of the items and wasting of time at the cash counter. Hence the proposed model in this paper can be used to make the shopping of the customer easier.

Once the user starts the shopping he has to press start button in the shopping basket. The RFID tag attached to the product is scanned with RFID Reader which reads the Product ID and retrieves the information of the product from microcontroller of the Arduino Nano. When the customer drops a product in the smart basket the information related to the product such as its manufacturing date, expiry date, net weight and the cost will be visible to the customer on the terminal i.e LCD display attached to the basket. A buzzer is also added in the trolley so that it will alert the customer when any false product such as product expired is added to the basket. Once the shopping is completed the end button is pressed and the invoice of the bill calculated will be sent as a message to the customer by connecting GSM and arduino.The customer can pay the bill by swiping the smart RFID card at the RFID reader which is rechargeable and the bill amount gets deducted from the smart card. The payment done successfully message along with the remaining balance in the smart card will be sent to the customer.

Fig: Smart Basket

Semi-Equalizing Load in Multi-hop Wireless Networks

B.Abhishek Reddy, Kayiram Kavitha, Ashoka Deepthi Manukonda, R.V.S.Lalitha, N.V.Krishna Rao

***Abstract*— Scheduling transmissions in a well-organized and fair manner in multi hop wireless network [MWN] is very crucial and challenging . For semi equalizing the load a distributed node scheduling algorithm is used through slot reallocation based on local information swap . The algorithm helps to find the delay or shortest delivery time is achieved when the load is semi-equalized throughout the network. We have simulated the Local voting algorithm and found that the system converges asymptotically toward the optimal schedule. In this paper we propose a congestion free scheme to schedule the node transmissions conflict free. The proposed algorithm achieves better performance than the other distributed algorithms in terms of fairness, average delay, and maximum delay in simulation results.**

Keywords: Multi-hop wireless networks, node scheduling algorithm, wireless mesh networks, load balancing.

I. INTRODUCTION

Modern life is greatly dependent on gadgets ranging from Smart television, Driverless cars, Smart phone etc. These devices require Wireless Networks, Cellular Technology, and routers etc. The Wireless Multi-hop Networks [1] require wireless connectivity in order to disseminate the network functionality. The devices are equipped with a wireless transmitter and receiver to enable communication between the devices and the central base-station as well. The base-station en-route data to the wireless end devices via multiple intermediate nodes. Each such transmission between the wireless devices is termed as a hop. As the data is transmitted by multiple wireless systems before reaching its destined wireless end system, we call such networks as wireless multi-hop networks. With ever growing network traffic, there was much focus on the practical working efficiency of Multi-hop Wireless Networks. In contrast to single wireless links, the multi-hop wireless network can improve the connectivity and coverage with its intermediate nodes participation in the network. Now-a-days the network coverage and in wireless multi-hop network, the most important requirement is connectivity.

It is more efficient to transmit over short links than the long links. Further they enable better data rate and higher throughput and more efficient use of wireless medium. The major advantage of this wireless medium is to avoid deployment of cables. Thus eliminating the hardware failure issues like cable break, hardware failure, signal disruption, low bandwidth etc.

To improve the operating efficiency of the multi-hop wireless network, efficient channel utilization is highly desired. This leads to node scheduling problem in it. The routing protocols used for the networks like fixed, cellular, and Internet are used for the multi-hop wireless networks for the reasons of performance efficiency. Other networks use unicast, multicast for routing whereas the multi-hop wireless networks employ multiple channels for routing. Also, multiple paths are created for its data transmission. Thus, the nodes need to follow a schedule. Node scheduling [2] is to schedule the transmission chance to a set of nodes without common obstruction among the transmitting nodes.

Several algorithms are available in the literature, for node scheduling in multi-hop wireless networks like DRAND [3], Load-Based Transmission Scheduling (LoBaTS) [5], LQF algorithm[6], Lyui's algorithm [4],.

In this paper, we discuss the issue of node scheduling in multi-hop wireless networks. Every transmission chance is scheduled to many nodes with guarantee of no shared impedance among any transmitting nodes. More explicitly, two nodes can be scheduled on a similar availability (and transmit at the same time). Hence, they should not interfere with each other. So, we present a congestion free scheme to schedule the node transmissions conflict free.

We present the detailed Literature Survey in the next Section.

II. LITERATURE SURVEY

The authors in [3] proposed Distributed Randomized TDMA Scheduling for Wireless Ad Hoc Networks (DRAND), which is the first fully distributed version of RAND. The algorithm is viable in adjusting to nearby topology changes without bringing about global overhead in the planning and time synchronization is not required. Because of these features, frequency or code scheduling are some of the scheduling problem used by DRAND in wireless network.

Lyui [4], is used for packet networks to assign the conflict-free broadcast

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An Effective System to Detect Fake Research

R. Mounika, Kayiram Kavitha, R V. S. Lalitha

Abstract— Detection of spam review is an important operation for present e-commwebsites and apps.We address the issue on fake review detection in user reviews in e-commerce application, which wasimportant for implementing anti-opinion spam.First we analyze the characteristics of fake reviews and we apply the machine learning algorithms on that data. Spam or fake reviews of the itemsreducing the reliability of decision making and competitive analysis.The presence of fake reviews makes the customer cannot make the right decisions of sellers, which can also causes the goodwill of the platform decreased. There is a chance of learing appraisals via web-based networking media systems whether states or harming by spammers on specific item, firm alongside their answers by recognizing these spammers just as in like manner spams so as to understand the assessments in the interpersonal organizations sites, we exist a stand-out structure called Netspam which uses spam highlights for demonstrating tribute datasets as heterogeneous subtleties systems to guide spam location treatment directly into gathering issue in such systems.

Index Terms: System Spam, online informal organizations, online web based life.

I. INTRODUCTION

A social spam message is possibly observed by everyone in these days in all ecommerce websites. Additionally also worse, it can activate misdirection along with a misconception in public as well as additionally trending subject discussions. These research studies this way have in fact come to be a vital think about the development of solution while desirable audits can bring benefits for a business, unfavorable research studies can probably influence reliability what's a lot more, develop monetary misfortune. The manner by which anybody with any sort of kind of character can leave comments as review supplies an appealing open entryway for spammers to include fake reviews planned to misdirect customers' thought. These misleading reviews destined to that component repeated by the sharing limit of online long range interpersonal communication just as moreover development on the web. The looks into considered change customers' comprehension of accurately exactly how incredible a point or observing are treating as spam notwithstanding are frequently included in kind for money advance As showed up in [1], 20% of the exploration thinks about in the Yelp site are on the whole factors considered spam research ponders. In any case, a great deal of composing has truly been disseminated on the frameworks used to perceive spam notwithstanding spammers notwithstanding furthermore amazing sort of appraisal regarding this matter to evaluate the proposed methodology, we utilized 2 tasting research datasets from Yelp alongside Amazon.com sites. Due to our understandings, perceiving 2 points of view for features (inquire about customer besides, social phonetic), the orchestrated features as assessment conduct have unmistakably more loads alongside produce much better execution on deciding spam reviews in both semi-oversaw just as furthermore not being seen strategies. As the impact of this weighting action, we can utilize many less features with significantly more loads to improve the accuracy with much substantially less time a few sided choice. Moreover, purchasing features in 4 real programs (look into study conduct, purchaser conduct, tribute etymological, customer phonetic), urges us to see basically exactly how much every grouping of features are added to spam proposal

Online Social media websites play a prominent function in careful expansion. So, this is considered as an essential source for makers in their marketing campaign along with customers in selecting services or product.

II. RELATED WORK

In an academia, [9] study observes the activities of spam reviewers in Twitter, in addition to uncover that the activities of spammers are numerous from real people in the location of posting tweets, followers, following buddies etc. [10] much better looks at spammer trademark with making a choice of nectar profiles in 3 gigantic interpersonal organizations arrange sites (Facebook, Twitter notwithstanding Myspace) just as in like manner recognizes 5 ordinary characteristics (followee-to-devotee, WEB LINK rate, message closeness, message sent, companion number, and then some) open door for spammer identification. By the by, albeit both of 2 methodologies existing convincible structure for spammer recognition, they don't have broad strategies needs notwithstanding form assessment.

In [8] authors handle a rotating technique, which mistreats the burstiness principle of analyses to distinguish testimonial

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Data Offloading for Effective Rescue Operations During Fire Disaster Management

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Abstract: Disasters such as fire, earthquake and tsunami, etc. often result in precious loss of life as well as pose great economic challenge to developing countries like India. Of late, fires in moving vehicles such as trains and buses have become very common in India leading to loss of life and property. As we cannot predict or control the disaster, we can at least make efforts in minimising loss and some effective rescue operations post disaster. It is very important to perform post disaster analysis of the event to have better rescue operations and also to analyse the reason behind the occurrence of such disaster if possible. So that if it is man-made disaster preventive measures could be prescribed in future. Many Wireless Sensor Networks were proposed in the past for disaster management. But, fire leaves the network disconnected and important data is left unused in the damaged network. So, we propose Internet of Things (IoT) which is a promising technology that can be used to solve some of the problems mentioned above. To date, the application of IoT in post-disaster management is still an unexplored problem. In this paper, we propose data offloading mechanism for effective rescue operations post disaster from damaged network. The network is partially damaged in case of disaster and using fog computing we retrieve data and transfer to cloud for better data analytics. We propose a data flow framework built for effective post-disaster management.

Keywords: Disaster management, Fire, Wireless Sensor Networks, Fog computing, Crowd sourcing, data offloading

I. INTRODUCTION

Around the world, there are numerous natural and man-made disasters [1], [2] such as Earth quake, Tsunami, Floods, Landslides, Forest fire and leakage in oil pipeline, industrial explosion, leakage in gas production, terrorist attacks respectively leading great loss to human life. Disasters lead to a great loss in economy of a country and such events are unpredictable and happen beyond human control. As a matter of fact, there is no concrete preventive measure that can be adopted but there are many prediction systems and post disaster management systems for event analysis and speedy rescue of victims.

Many disasters can be predicted based on certain natural phenomenon happening before the event based on certain parameters like rector scale for earth quakes, humidity and pressure for Tsunami etc. The meteorological station employs technology for continuous monitoring of such events. But Fire Disaster [3], [4], [5] is one of its kinds of disaster which can neither be predicted nor be monitored due its quick spreading nature resulting in huge loss of life and property. If a fire disaster happens in a running train, then nothing could be as disastrous as the fire spreads rapidly due to its speed. Many such events happen in India every year leading to great human loss. We cannot bring back life but certain rescue measures can be taken quickly to mobilize victims and for efficient post disaster management. It is shocking to find that the Indian Railways don't have even simple precautions like installing a fire detector in trains. This solution even if followed, however, may not help solve the problem since trains often move at a high speed and fire spreads almost instantaneously. Thus there is an urgent need to develop some devices which can adapt advanced technologies that can handle fires in dynamic environments and help prevent such disasters.

It is an era of Internet of Things (IoT) [6], where embedded devices can be communicated, managed, and monitored with its counter parts. IoT has been deployed in a variety of disaster scenarios and have also proven to be very effective. IoT technology can combine heterogeneity, interoperability and distributed processing in real-time. IoT originated from the primary idea of sense and send strategy of the Wireless Sensor Networks (WSNs). Among the applications of WSN, fire disaster management is one of its important applications. In addition, IoT can greatly help to perform some valuable data analytics helpful to perform post event analysis. This is because of the ability of the IoT devices to collect data from heterogeneous environment, and heterogeneous devices and push to the network or cloud or the external world for necessary action. Hence, IoT is ideally suitable to monitor disasters in real-time and therefore take steps to mitigate them and save precious lives and resources. We plan to use IoT in this paper to perform Fire disaster monitoring.

In section 2, we brief on the various existing fire disaster management systems in literature. We give the details of our proposed system in Section 3. The dataflow diagram depicts the flow of information in the entire system in Section 4. Finally we present the conclusion in Section 5. Now, we give the literature survey in the proceeding Section 2.

II. LITERATURE SURVEY

Many WSN based fire disaster management systems [7] were proposed in the past. But, WSNs are lack of interoperability, support for heterogeneous devices, energy efficiency etc. Also, in case of fire, many nodes in the network are damaged and data in the nodes become useless.

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Smart Surveillance with Smart Doorbell

R.V. S.Lalitha, Kayiram Kavitha, N V Krishna Rao, G. Rama Mounika, V. Sandhya

Abstract: ***Home Security has become an important concept in the modern era. Our Smart Doorbell can alert the resident automatically with an alarm when there is a visitor at the door. As we witness a huge transformation in technology, the world is emerging smart in every aspect. These smart devices are invading into our lives, while offering the required privacy. The Internet-of-Things (IoT) devices remotely monitor objects connected by Internet. In this paper, we have developed a smart doorbell that can alert the residents when it detects human presence and triggers the doorbell to notify its residents and also can send the data to the cloud or any storage devices spontaneously. The smart doorbell developed will have PIR or ultrasonic (passive infrared) sensor that detects the presence of humans over a given distance and can capture the picture of the object near the door. Further, this picture is e-mailed to the registered e-mail and also pushed to cloud as well offering the required privacy.***

Index Terms: ***Home security, IoT, Raspberry Pi, Smart Doorbell and Wireless Communication.***

I. INTRODUCTION

With the evolution of Internet, Wireless Sensor Network Technologies, IoT [1] has evolved as a concept to enable communication between heterogeneous devices (things or objects like sensors, actuators, RFID tags etc.). These IoT devices operate without a screen or user interface in a resource constrained environment usually dedicated to a single task. There are many constraints in IoT like battery power, memory space, and security as these devices are connected instantly with anything, anyplace and anytime. In contrast to traditional internet the IoT device is intelligently gathering, analyzing the human behavior [2]. The high connectivity of these intelligent objects leads to serious security issues. IoT is formed with network of sensor objects that can communicate via Internet involving activities from the external environment. Any communicating device with a unique identification can be part of the network. In future, IoT-based technology will influence the activities in daily life. Many IoT applications can be found in many industrial, scientific, agricultural equipment, transportation systems etc. According to Gartner report [3] the number of smart phones and tablets will reach up to 7.3 billion units by 2020. As a tremendous growth is observed in IoT, the communication network has challenges in terms of huge amount of data, processing power with energy consumption, security threats, and efficiency of cryptographic algorithms. Home Security has become an important concept in the modern era. The home security system provides continuous monitoring with CCTV surveillance. As we witness a huge transformation in technology, the world is emerging smart in every aspect. These smart devices are invading into our lives, while offering the required privacy. These Internet-of-Things (IoT) devices remotely monitor objects connected by Internet. We are living in a digital world where every activity needs to be recorded through Closed Circuit Television (CCTV) surveillance cameras. It is neither possible to continuously monitor the CCTV footage nor inspects the door every minute. Also, there is a need for monitoring our premises we need an alert immediately when a stranger is seen in front of the door. Our Smart Doorbell can alert the resident automatically with an alarm when there is a visitor at the door. In this paper we have developed an IoT based Smart Doorbell to can alert the resident automatically with an alarm when there is a visitor at the door. The smart doorbell is connected to the internet and can capture the visitor at the door and transfer that information to the cloud or any storage devices spontaneously. In case of any break into the house, we have the evidence of crime from the video footage available[17]. Such systems only serve as monitoring system. In case of any unforeseen event this camera footage can be helpful in providing eye witness for post event analysis. The system can alert the home owner about the visitor waiting at the door. This surveillance is done 24*7, so the system requires huge memory to store the video data. Obvious reasons are that these devices are wireless networks and also due to continuous capture of video leads to higher memory requirements in the device. The Raspberry Pi based applications for motion detection finds ease in developing intelligent based communications. The Smart Doorbell is helpful in remote monitoring the premises of a home even from office as now-a-days family members are out for most of the times and feel insecure about their home. This IoT based system provides a secure and reliable solution. Prior to this, various systems came into existence like pi camera and GSM module which included various incompatibilities i.e., delay in alerting the user, functioning with systems or heavy equipment which are not portable. In this Paper, we advise a method to maintain such networks at a very low price. Our IoT based application can monitor the home premises and alerts if any object is detected at doorstep. This security system can be placed at the main door of home or office and can be monitored from anywhere in the world via internet. This automated system proves to be useful for people in providing security, comfort and ease in access. In addition,

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EPNN Based High Secure Intensive Hidden Digital Watermark Application in Telemedicine

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encryption, watermarking, LWT, extended euclid's approach, probabilistic neural networks

ABSTRACT

This paper presents a novel and secure hybrid approach to securely transmit multimedia medical content over the web to help diagnosis from distance. This approach is a combination of a novel encryption algorithm and Extended Euclid's based watermarking algorithm. This approach provides authentication, confidentiality, and integrity. The user's authentication data is converted into ciphertext and then inserted into the watermark image, a 2-level LWT based decomposition of a host image is performed to retrieve (LL, LH, HL & HH) coefficients. The watermark and cover image one-level LL coefficients are divided into 16*16 blocks and watermark image blocks are embedded into a cover image using Extended Euclid's algorithm. Then the watermarked image and cover image is given as input to PNN to obtain the optimized image matrix. The experimental results show better Peak Signal to Noise Ratio, Mean Square Error and Normalized Correlation with respect to existing methodology. Also, the watermarked image quality is analyzed with different image quality metrics.

1. INTRODUCTION

In modern health environment, many clinicians or health care providers share medical multimedia content like images and electronic patient data as a part of applications of telemedicine such as telediagnosis, teleradiology, telesurgery, teleconsulting, etc. With the increased use of teleradiology, the need for security and privacy concern issues in telemedicine is also growing. Another issue is that the transmitted multimedia content is very much tamper prone. So there is a desperate need for implementation of secure medical transfer schemes like medical image watermarking to achieve the security services of cryptography like authentication, integrity, and confidentiality. Authentication verifies that whether the received image arrives from the correct source and belongs to the intended patient or not, confidentiality ensures that only legitimate users have access to the transmitted image and whereas integrity checks that whether the received image has not been transformed by the unauthorized users [1].

Medical Image watermarking can be used to serve the purpose of transferring the medical history of a patient through the web. Patient details can be embedded in the medical images in an encrypted form. At the receiver's end, it can be extracted and decrypted to verify the patient details. Through medical image watermarking patient information is maintained confidentially. The proposed approach also provides authenticity and integrity for the content of the medical image.

The proposed methodology relies on Lifting Wavelet Transform. LWT coefficients are represented as finite precision number which helps in lossless coding. LWT provides lossless compression. LWT can reconstruct the image without any loss as LWT coefficients are integers values that can be accumulated without any round-off errors. LWT implements the lifting scheme. Lifting the wavelet scheme is treated as the best solution than DWT as it is more advantageous for different applications [2]. It is the second generation of the fast wavelet transform. As lifting wavelet increases smoothness and reduces aliasing effect it is considered as better for the reconstruction of the image when compared with general wavelet transform [3]. Applying LWT improves the robustness of the watermark as it enhances the integrality of an embedded watermark in the host image, which results in reduced information loss.

The performance of traditional watermarking methods can be enhanced by artificial neural networks [4]. The relation of watermarked image and watermark image can be memorized by artificial neural networks. One of the artificial neural network methods used is the Probabilistic Neural Network (PNN). This consists of nodes of 4 layers [4]. They are input, pattern, summation and output layers [4]. PNN identifies a learning category and finds out the possibility of similar input sample with the help of the radial bias function.

The proposed approach uses extended Euclid's algorithm to get modular multiplicative inverses so that they can be replaced by cover image pixel values. Modular multiplicative inverse exists only if two integers are coprime i.e. when their gcd is 1. In this algorithm, every divisor and remainder is represented as a linear combination of the two numbers. This algorithm finds x such that ax≡(1modm) [5]. PNN is also used in this approach to improve the robustness of the watermarked image.

The proposed work is organized as follows: Related Work is analyzed in SectionII Section III analyzes the proposed work in detail. Experimental results were shown in section

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Effect on structural and magnetic properties of Mg^{2+} substituted Cobalt nano ferrite

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Dielectric and piezoelectric properties of Sm^{3+} doped lead barium niobate (PBN) ceramics

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Outline

Highlights
Abstract
Keywords
1. Introduction
2. Experimental
3. Experimental result and discussion
4. Conclusion
Conflicts of interest
Appendix A. Supplementary data
Research Data
References

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Effect of Zn–Cr substitution on the structural, magnetic and electrical properties of magnesium ferrite materials

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Synthesis, Structural And Magnetic Properties Of $SrFe_{12}O_{19}$ Hexaferrites

S. J. MARGARETTE, A. VENKATESWARA RAO, RAGHAVENDRA VEMURI, N. MURALI, Y. RAMAKRISHNA, V. VEERAIAH, M. INDIRA DEVI

Abstract: In this study, $SrFe_{12}O_{19}$ hexaferrites is synthesized by citrate sol-gel auto-combustion route. The standard analytical techniques such as X-ray Diffraction analysis (XRD), Field Effect Scanning Electron Microscopy (FE-SEM), Energy-Dispersive Spectroscopy (EDS), Fourier Transformer Infrared (FT-IR) Spectroscopy, Raman spectroscopy and magnetic studies (VSM) are applied to study the characteristics of the sample prepared. The X-ray diffraction patterns are used to analyse the structural properties of the sample. The information about the particle formation and size are obtained using scanning electron microscope (SEM). An energy-dispersive x-ray analysis tool (EDX) provides the elemental composition of the nano-particle. The Fourier transform infrared (FT-IR) spectra revealed about the functional group bonds between metal and oxygen (M–O). The vibrating sample magnetometer (VSM) technique, which is recorded at room temperature, revealed the magnetic properties of the sample with the hysteresis loops showing its magnetic behaviour.

Keywords: M-type hexaferrites, FE-SEM, Raman, VSM.

1. INTRODUCTION

In the year 1950, M-type strontium hexa-ferrite ($SrFe_{12}O_{19}$) is discovered by Philips' laboratories [1]. The M-phase ferrites (Pb, Sr, Ba)$Fe_{12}O_{19}$ have magneto-plumbite structure which are commonly called as hexagonal ferrites. As compared to the other M-phase ferrites, strontium ferrite ($SrFe_{12}O_{19}$), is an important member of hexa-ferrites series. The saturation magnetization is higher, Curie temperature is high, the magneto-crystalline anisotropy is large, conductive losses are low with high permeability. These ferrites also have excellent chemical stability and corrosion resistivity with high coercivity [2-4]. All these properties of strontium ferrites made it the popular option for its usage in industrial applications like electromagnetic wave absorber ferrox dures, perpendicular magnetic recording media, magnetic recording media, microwave devices, magnetic fluids, magnetic coatings, magnetic catalysts and so on [5-14], optoelectronic materials [15-30] and energy materials [30-50] . Basing on their chemical and crystalline structures, these ferrites are divided into five categories. The five types are (a) M-type ($SrFe_{12}O_{19}$), (b) W-type ($SrM_2Fe_{16}O_{27}$), (c) Y-type ($SrM_2Fe_{12}O_{22}$), (d) X-type ($Sr_2M_2Fe_{28}O_{46}$) and (e) Z-type ($Sr_3M_2Fe_{24}O_{41}$). There is a combination of two structural blocks, which are stacked along the c-axis in the crystal structure of magneto-plumbite unit cell of the M-type hexagonal ferrite.

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The crystal structure consists of 10 hexagonally close-packed oxygen layers in the pattern of RSR*S*. Here S block stands for spinel structure and R block stands for hexagonal structure. When R block is rotated by 180° with respect to c-axis having equivalent atomic arrangements, we get R* blocks. Likewise when S block is rotated we get S* blocks. [15, 16]. At the Fe^{3+} or Sr^{2+} sites or both, the substitution of cations from metal ions to rare earth elements is done. This resulted in the improvement in the various properties of the hexa-ferrites. The preparation of solids is carried out by single source precursor since it provides excellent control over the stoichiometry. The other preparation methods are also adopted to synthesize strontium hexa-ferrite like hydrothermal method, sono-chemical method, reverse micelle technique, micro-emulsion, combustion routes, co-precipitation and sol-gel. As compared to all the other methods sol–gel is advantageous since it maintains excellent homogeneity of the product, better compositional control and processing at lower temperatures [17-25]. Here, we report that the structural, spectroscopic and magnetic study of $SrFe_{12}O_{19}$ ferrites, which are synthesized by sol-gel auto combustion method. The crystal structure with respect to the vibrational and magnetic properties is investigated along with the explanation of the atomic arrangement in $SrFe_{12}O_{19}$ hexaferrites.

2. PREPARATION AND EXPERIMENTAL TECHNIQUES

$SrFe_{12}O_{19}$ hexaferrites are prepared by sol-gel auto-combustion method using $Sr(NO_3)_2$, $Fe(NO_3)_3.9H_2O$, and $C_6H_8O_7.H_2O$ as precursors. All the reagents are weighed in stoichiometric portions. Strontium and cerium nitrate are diluted into methanol, and ferric nitrate into 10 ml of methanol. The solutions of all the nitrate salts are combined together in a 250 ml beaker, with the aqueous solution of citric acid that acts as the chelating agent. The beaker is placed on a hot plate with continuous stirring, maintaining at 80°C. The solution changed into a viscous solution and finally to a thick viscous gel after evaporation. This constant stirring continued for nearly 12 to 18 h. The gel is converted to ash coloured powder on the removal of all water molecules from the mixture. This was followed by preheating at 900 °C for 2 h to remove the volatile

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ORIGINAL PAPER

On Spectral Relaxation Approach for Thermal Diffusion and Diffusion Thermo Effects on Viscous Dissipative Casson Fluid Through a Stretched Surface

G. B. Chandra Mouli[1] · Kotha Gangadhar[2] · B. Hema Sundar Raju[3]

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Abstract
An investigation has been performed to study the influences of Soret and Dufour on steady, viscous dissipative Casson fluid flow along a linear stretching surface. Numerical solution of this problem is obtained by Spectral Relaxation Method. The outcomes are enumerated in terms of profiles of velocity, temperature, concentration, coefficients of skin friction, Nusselt and Sherwood numbers with reference to certain physical parameters. The results show that velocity reduces when there is an increase in Casson parameter. The Nusselt number enhances with Soret number whereas it decreases by enhancing Dufour number. Also, Nusselt number as well as Sherwood number increase with ratio parameter. Further, concentration profiles decrease because of increment in ratio parameter and Schmidt number, but they raise for higher Casson parameter and Soret number values.

Keywords Soret and Dufour effects · Casson fluid · SRM · Three-dimensional flow · Viscous dissipation

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65

Improving performance of a trapezoidal-trough thermosyphon solar collector using peripherally wing-cut swirl generator

M. Murugan, R. Vijayan & A. Saravanan

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Mechanical and Dry Sliding Wear Behaviour of Al6061/Gr MMCs and its Multi Response Optimization using Hybrid Fuzzy Grey Relational Technique

P. Gangadhara Rao, Pandu R V, K. Meera Saheb

Abstract: An attempt is made to find the mechanical and tribological properties of Al6061/Gr metal matrix composites (MMC) produced using stir casting method. It is important to note that the certain components require high hardness and wear resistance to fulfil the functional requirements, the said properties of the MMCs influenced largely on the condition with which they are produced or treated. Therefore, in the present paper the composites are tested in two stages that is before T6 heat treatment and after T6 heat treatment respectively. The composites are made with Al6061 alloy as matrix and graphite with 3%, 6%, 9% and 12% by wt is considered as reinforcement. Once the composites are prepared, they are examined for their microstructural, mechanical, and tribological properties. Further, a response surface methodology (RSM) has been used to model the wear loss and coefficient of friction for both before and after T6 heat treatment of MMCs. The non-linear regression model obtained is validated both statistically and with the help of experimental test cases. The evidence of wear phenomenon has been observed with the help of Scanning Electron Microscopy (SEM). Further, fuzzy grey relational Technique has been used to determine the multi performance index for the dry sliding wear and friction phenomenon of the developed composite.

Keywords: Response surface methodology, Fuzzy grey relational techniques, Wear loss, Coefficient of friction, MMCs.

I. INTRODUCTION

Now-a-days, Aluminium metal matrix composites (AMMC) are popularly used in engineering applications since they are light in weight and provide better performance in terms of high tensile strength, low density, good thermal and electrical conductivities. It is to be noted that the reliability of AMMC's have been evaluated and proven useful in various fields of engineering, such as aerospace, automotive and defence industries. They are also used in various structural applications as well as special functional applications due to their custom-made mechanical properties that resulted from the reinforcement of different metals. On the other hand, graphite is considered as the most important constituent for solid lubrication in the alloys and ceramic reinforcement composites. Several researchers had worked on the usage of various carbides, oxides, and graphite as reinforcement materials with various aluminium alloys [1]. Rama Rao and Padmanabhan [2] developed aluminium and boron-carbide composites using stir casting and analyses for microstructural characteristics of the same. The observations show boron carbide powder particles were distributed uniformly throughout the composite due to the stirring action. Ghauri et al. [3] fabricated Al-SiC MMCs after using different volume fractions of SiC. The toughness and hardness were increased due to the existence of SiC particles uniformly in the composite. The mechanical and microstructural characterization of AMMCs reinforced with Nano - MgO particles was studied by Ansary et al. [4]. The observations show that the composite containing 1.5 vol% MgO produces at 850°C develops homogenous microstructure and improved mechanical properties. Further, Alhajeri et al. [5] produced Al6061 MMCs having 10% Al_2O_3 particles by volume using high pressure torsion technique. The results obtained shows considerable enhancement in hardness and the SEM images demonstrate the spreading of Al_2O_3 particles uniformly in the Al6061 metal matrix. Also, this technique brings the strain hardening phenomenon to the composite without considerable recovery. The abrasive wear characteristics, such as coefficient of friction and weight loss of Al-12%SiC reinforced by TiC was investigated by Yigezu et al. [6]. They considered three input parameters namely composition, sliding distance, and load. The results predicted the significant increase in wear resistance characteristics. Baskaran [7] inspected the sliding velocity influence on the wear phenomenon of AA7075/TiC MMCs. The concept of Taguchi's experimental design is applied to observe the wear phenomenon. Further, Rajesh et al. [8] examined the dry sliding wear phenomenon of graphite reinforced with pure aluminium using the statistical modelling to analyze the Wear loss and COF. It was noticed that the COF and wear volume loss were affected by sliding distance and reinforcement respectively. Further, Rao et al. [9] experimental work on the wear resistance properties of AA7075/TiC MMC, before and after T6 heat treatment of MMC. It was observed that the after-heat treatment condition the composite resulted better in the mechanical properties and tribological characteristics than that of non-heat treatment condition.

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67

Influence of Corrugated Booster Reflectors in a Centrally Finned Twist inserted Solar Thermal Collector on Heat transfer and Thermal performance characteristics

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ABSTRACT

In this present work the influence of Corrugated Booster Reflectors (CBR) in a Centrally Finned Twist (CFT) inserted Solar thermal Collector on heat transfer and thermal performance characteristics has been approached experimentally. The experimental trials have been made with two different twist ratios (Y = 3 and 6) for typical twist (TT) and centrally finned twist (CFT) under same working conditions. The results were compared with the plain tube solar thermal collector with Corrugated Booster Reflectors (CBR plain)

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68

REVIEW

A Review on Surface Modifications and Coatings on Implants to Prevent Biofilm

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Abstract
Bacterial infections associated with biomaterials are currently regarded as the most severe and devastating complications for their use as implants and medical devices. Biofilm is the major cause of bacterial infections associated with biomaterials. This review presents the biofilm formation, associated infections, and their current prevention strategies. The loss of efficacy of conventional antibiotic therapies leads to the development of antibacterial surfaces and coatings. Multifunctional surfaces and coatings can prevent biofilm formation and can become a novel strategy to fight biofilm. In this review, attention is focused on different surface modification techniques, surface coatings, and their current manufacturing methods to produce antibacterial biomaterials using surface engineering and nanobiotechnology.

Lay Summary
Implants and medical devices are widely used in present day medicine in different ways. Implant infections caused by bacteria lead to serious complications and failure of implants. Bacteria attach to the surface of implants and form colonies called biofilm which is a major cause of implant-associated bacterial infections. The conventional antibiotic therapies present various limitations in biofilm treatment. Promising strategies based on material science and surface engineering are being developed to address these limitations. This review article discusses the different non-conventional methods to treat biofilms. A specific discussion involves surface modifications, surface coatings, and their interactions with biofilm-causing bacteria. Establishing standardized procedures for testing toxicity and tissue integration of these surfaces and coatings will guide the future strategies in developing infection-resistant biomaterials.

Keywords Biofilm · Implants · Surface modifications · Coatings

Introduction

Implants are used to support and replace or enhance a body structure. Implants are used to some extent in dentistry, orthopedics, neurosurgery, cardiovascular surgery, urology, and plastic and reconstructive surgery. The reasons for their use are varied such as to replace worn, damaged, or diseased parts of the anatomy; to improve the function of an organ; to correct a deformity; to enhance the appearance. Metal alloys, ceramics, polymers, composites, and glasses are used as implants (Table 1).

Biofilm Formation

Bacteria encased in self-secreted extracellular polymeric substances (EPS) matrix form a 3D bacteria community called biofilm. Biofilm growth is distant from planktonic or free-floating bacteria. Proteins, polysaccharides, lipids, extracellular DNA (3% by weight), and water (97% by weight) are the constituents of the biofilm matrix [20]. Bacteria in a biofilm are up to 600 times less susceptible to disinfectants and up to 1000 times less vulnerable to antibiotics compared with planktonic counterparts [21–23]. *Enterococcus faecium*, *Staphylococcus aureus*, *Klebsiella pneumoniae*,

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Biofilm Resistant Surfaces and Coatings on Implants: A Review

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Abstract

The study of microbes in and around us that have a drastic affect on human health plays a vital role in medicine. Bacterial infections kill millions of people in the world. The structured formation of bacterial communities, known as biofilms, is the major cause of bacterial infections. Nosocomial infections are caused by biofilms due to their pathogenic nature. Biofilms contribute about 80% and 65% to chronic and microbial infections respectively. The adhesion of bacteria to implant surface is the source of biofilm formation. Therefore, the surface characteristics of the implant material dictate the host cells association and response. Biofilms are resistant to antibiotics, disinfectants, and the human immune system. Implants surface modifications play a vital role in improving their biocompatibility and anti-infection properties. Providing antibacterial and adhesion resistant surface coating acts as a novel approach to combat biofilms. This review presents the process of biofilm formation on different implants and the next generation of surface modification techniques to enhance biocompatibility and antimicrobial functionality using surface engineering and nanobiotechnology.

Selection and peer-review under responsibility of the 9th International Conference of Materials Processing and Characterization. ICMPC-2019

Keywords: Biofilm; implants; surface modification; antibacterial coatings; antibacterial surfaces

1. Introduction

The replacement, or enhancement, and support of a body structure is done by use of an implant. Orthopedics, cardiovascular surgery, urology, dental, neurosurgery, plastic and reconstructive surgery all utilize implants to some extent. The reasons for their use are varied such as to replace worn, damaged or diseased part of the anatomy; to

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Experimental study on a shell and tube heat exchanger with novel self agitating inserts

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P. S. V. V. Srihari, P. S. V. V. S. Narayana, V. Hemanth Kumar, V. S. Surya Prakash, and P. Jaikishan

AIP Conference Proceedings

Influence of slat and flaps arrangement on the performance of modified Darrieus wind turbine

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Comparative analysis of pulsed Nd:YAG laser welding of 304L and 904L stainless steel

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ABSTRACT

The current study investigates the comparative study of similar pulsed Nd:YAG laser welding of 304L and 904L stainless steel. In the present study both austenitic stainless steel (304L) and super austenitic stainless steel (904L) are laser welded at 5 mm/s scanning speed, 25 Hz pulse frequency and 0.75 mm laser spot diameter. The ultimate tensile strength of both laser welded specimens were equal to the respective parent metals. The percent of ductility is more in 304L than 904L laser welded specimen comparatively. The weld bead shape of the two welded specimens are V shaped for 304L and H shaped for 904L at the same laser process parameters due to difference in thermophysical properties of the two materials.

Selection and Peer-review under responsibility of the scientific committee of the 2nd International Conference on Processing and Characterization of Materials.

1. Introduction

Laser beam welding is a non contact joining process for welding of both similar or dissimilar materials. This process is widely used for joining of wide range of materials namely stainless steel, carbon steel, HSLA steels titanium etc. This advanced joining process are overwhelmingly getting popularity due its increasing demand in automotive, aerospace and medical industry. Welding is a method of fusion joining two comparable or dissimilar metals, with or without pressure application and with or without filler metal implementation. Weldability of the material relies on multiple variables such as metallurgical modifications resulting from welding, changes in material hardness, in and around the weld, and the magnitude of the joint's cracking inclination.

LBW is a high density welding method. LBW has two important characteristics namely narrow HAZ and minimum distortion, comparative to the conventional joining. Because of effective and precise operation this joining technology is overwhelmingly popular. Many researchers are working in area of laser welding for joining of similar and dissimilar materials. El-Batahgy et al. [1] studied the laser welding of austenitic stainless steel to analyze the weldment shape and solidified structure of different thicknesses at varying laser process parameters. Rai, R et al. [2] have numerically explored 3D heat transfer and fluid flow in keyhole mode for electron beam welding in stainless steel at varying spot radius and constant power. Wang et al. [3] explored the mechanical properties of stainless steel constituent made by additive manufacturing based on laser deposition. Zambon et al. [4] studied laser welding of superaustenitic stainless steel 904L for optimizing the process parameters using several trials. They have studied the residual stresses using XRD and explored the mechanical properties. Kumar et al. [5] studied the pulsed Nd:YAG laser welding of austenitic stainless steel (304L) and carbon steel (st37) of 1.4 mm thickness for butt joint configuration have been investigated for automotive industries. The effect of pulsed width on weld bead width (top bead width (TBW) and bottom bead width (BBW), depth of penetration (DOP) and heat affected zone (HAZ) and fusion zone area. Kumar et al. [6] the investigated the titanium alloy Ti6Al4V of 1.4 mm thickness has been laser-welded in butt joint configuration using pulsed Nd:YAG laser system. The effects of heat input on weld bead shape, fusion zone width (top, middle, and bottom), heat-affected zone (HAZ) width (top, middle, and bottom), and fusion zone area have been studied. The microstructure and mechanical properties of laser-welded specimens at various heat inputs (43.7–103.5 J/mm) have also been investigated. Raj and Vasudevan [7] predicted for distortion that occurred during TIG welding of low carbon steel. 3-D finite element model of distortion

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Enhancing Productivity of V-Trough Solar Water Heater Incorporated Flat Plate Wick-Type Solar Water Distillation System

This experimentation deals with the comparative study of a flat plate wick-based solar water distillation system (SWDS) with and without V-trough (VT) solar collector (SC) under the actual environmental conditions of Salem, Tamilnadu, India, as an attempt to enhance the productivity of the solar water distillation system. The influences of wick material, solar intensity, flow rate, and ambient temperature on productivity are also proposed. To ensure accuracy in the experimentation, the overall observation is divided into four spells with four different wick materials. The hourly productivity of the proposed still is compared with the standard theoretical equation, and the deviation between them is well accepted with ±10.14%. The maximum convective and evaporative heat transfer coefficients are observed during spell 3 as 2.488 W/m^2K and 25.321 W/m^2K, respectively. The prediction of Nusselt number and Sherwood number are also proposed to validate the heat transfer and mass transfer, respectively. Compared to polyester, terry cotton, and jute wick materials, fur fabric wick yielded maximum productivity of 4.40 l/day and 6.29 l/day for SWDS alone and SWDS with VT, respectively. The results revealed that the productivity of the SWDS coupled with V-trough SC is 30.12% greater than SWDS alone.
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Introduction

The securities of energy and water are two significant issues which humankind must deal with to achieve the economic improvement of human culture. Nowadays, the scarcity of water is a major issue faced by many regions of Africa and is much worse in developing countries due to increased demand for water because of population explosion and deforestation [1]. In order to address the water scarcity, different conventional freshwater production techniques are considered for domestic, commercial, and industrial applications. Compared with the conventional freshwater production techniques, solar desalination methods are found impressive consideration everywhere in the world because of its abundance and ecologically clean to the environmental concerns [2,3]. At the same time, the production of freshwater using solar energy is not only gifted and promising technology for sustainable development, but also it restricts the higher level of energy consumption and emission of greenhouse gases [4].

The above literature study has concluded that the solar energy based desalination system is the best in terms of money and environmental concerns. The performance of inverted multiwick solar still has been compared with the conventional multiwick solar still. The final results proved that the proposed solar still has produced 20% higher performance than the conventional one [5]. The productivity of a small conventional basin-type solar still has been improved by integrating it with a wick-type solar still which gets warm waste brine solution to the basin. When compared with basin-type and wick-type solar stills separately, the integration of the both stills has been found to be more economical and efficient. The results concluded that the total yearly distilled water production of the proposed still was 85% more than the basin-type and 43% more than the wick-type solar still [6]. A tilted wick-type solar still with a charcoal cloth as an absorber/evaporator material has been designed and constructed. The experimental tests have been conducted under indoor and outdoor conditions. The results predicted that the daily efficiency of the still has been increased by about 53% on clear days in summer and the rise in the salinity of the input water has reduced the efficiency of the system from 37.7% to 20% in indoor testing [7]. The effect of various wick materials has been reviewed in an inclined type wick material based solar still. Compared to terrycloth, jute cloth, and polyester material, fur fabric has produced a maximum yield of 3.63 L/day for the flat plate absorber at 30° inclination. The hardness of water before and after distillation has been found as 5026 ppm and 77 ppm, respectively, at 28 °C (room temperature) [8]. A black-coated jute wick material has been rotated horizontally and vertically inside the still under constant ON time and variable OFF time conditions. Compared to conventional solar still, the proposed still with rotating wick material has enhanced the cumulative productivity by 315% with nanofluid and by 300% without nanofluid [9].

The effect of an external reflector with different inclinations on the productivity of a basin type solar still has been examined experimentally in summer, autumn, and winter. The presence of internal and external reflectors has improved the daily yield. The increase in the productivity of the still has averaged as 19.9% for the still with internal reflector only, and 34.5%, 34.4%, 34.8%,

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Authors Authors and affiliations

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87

House Price Prediction Using Machine Learning

G. Naga Satish, Ch. V. Raghavendran, M.D.Sugnana Rao, Ch.Srinivasulu

Abstract: Machine learning plays a major role from past years in image detection, spam reorganization, normal speech command, product recommendation and medical diagnosis. Present machine learning algorithm helps us in enhancing security alerts, ensuring public safety and improve medical enhancements. Machine learning system also provides better customer service and safer automobile systems. In the present paper we discuss about the prediction of future housing prices that is generated by machine learning algorithm. For the selection of prediction methods we compare and explore various prediction methods. We utilize lasso regression as our model because of its adaptable and probabilistic methodology on model selection. Our result exhibit that our approach of the issue need to be successful, and has the ability to process predictions that would be comparative with other house cost prediction models. More over on other hand housing value indices, the advancement of a housing cost prediction that tend to the advancement of real estate policies schemes. This study utilizes machine learning algorithms as a research method that develops housing price prediction models. We create a housing cost prediction model In view of machine learning algorithm models for example, XGBoost, lasso regression and neural system on look at their order precision execution. We in that point recommend a housing cost prediction model to support a house vender or a real estate agent for better information based on the valuation of house. Those examinations exhibit that lasso regression algorithm, In view of accuracy, reliably outperforms alternate models in the execution of housing cost prediction.

Index Terms: Machine learning algorithm, lasso regression process and neural system, hosing cost prediction.

I. INTRODUCTION

What Is Learning? Rats Learning to Avoid Poisonous Baits: Rats normally stumble upon food items by its look and smell and start eating in small amounts and later depending on food and physiological effect the feeding of food goes on. If the rat notices the illness of the food, the rat will not touch that food. Similarly the machine learning mechanism plays a vital role same as animal usage of past experience for acquiring and expertise in detecting the food safety. By mistake if the knowledge with the food is negatively labeled, the prediction of the animal will also will be negatively affected and encountered in the future. With the inspiration of the previous example of successful learning we demonstrate a typical machine learning algorithm .Likewise we would want to program a machine that learns how to filter spam e-mails. A credulous result might be apparently comparable of the lifestyle of rats that, how to keep away from poisonous baits.

The machine will basically remember the past e-mails that needed been named similarly as spam e-mails by the human user. When another email arrives, the machine will look for it in the past set about spam e-mails. Though it matches among them, it will be trashed. Otherwise, it will make moved of the user's inbox organizer.

At the same time the first "learning by memorization" methodology may be useful, it fails to offer an important aspect known as learning systems – the capacity to mark unseen email messages. A fruitful learner ought to have the ability which will be the advancement from distinctive samples to more extensive generalization. This may be Likewise as inductive thinking or inductive induction. In the attraction nervousness exhibited previously, after the rats experience a sample of a certain sort about food; they apply their disposition at it once new, unseen illustrations from claiming nourishment of comparable emanation Also taste. Should attain generalization in the spam sifting task, those learner might examine the Awhile ago seen e-mails, and extricate An situated about expressions whose presence for a email message is characteristic of spam. Then, At another email arrives, those machine could weigh if a standout among the suspicious expressions gives the idea On it, and foresee its mark Appropriately. Such an arrangement might possibly have the ability effectively to foresee the name about unseen e-mails.

Responsibilities further than Human Capabilities: an additional totally crew about errands that profit starting with machine Taking in systents are identified with the Investigation for extremely substantial and intricate information sets: galactic data, turning restorative chronicles under restorative knowledge, climate prediction, and dissection of genomic data, Web serch engines. Also electronic trade. With an ever increasing amount accessible digitally recorded data, it gets evident that there would treasures about serious majority of the data covered clinched alongside information chronicles that would best approach excessively little and also as well perplexing to people with bode well about. Taking in with recognize serious examples over substantial Also complex information sets may be a guaranteeing space for which the blending of projects that take for the Just about boundless memory limit and ever expanding transforming velocity about PCs opens up new horizons.

Regulated versus Unsupervised, since taking in includes an association between those learner and the environment, you quit offering on that one might separate taking in assignments as stated by those nature for that connection. The to start with qualification will note is the Contrast the middle of regulated and unsupervised Taking in. Likewise an illustrative example, think about that errand for Taking in will recognize spam email versus the undertaking about uberrance identification. For the spam identification task, we think about a setting to which the learner receives preparing e-mails to which the mark spam/not-spam

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13

Implementation of a Game Based Learning Model using Sequence Square Box (SSB) Technique

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Abstract: *This paper presents the systemic approach to education and educational innovation practices. A new approach and alternate view of game model used to customize learning experiences. It uses intelligent data, analysis models to find how the students learn and improve on their experience. The way of teaching aims to deploy the animations and easy way of understanding the concepts through game based learning. The main aim is to design interactive tool usage for simplicity and less complexity. The proposed gaming strategy is deployed for the purpose of easy way of understanding to arrange in ordered fashion called Sequencer Square Box technique. Using this technique, players or learners can have the ability to find, share the information through friends. They can easily explore, collaborate their ideas and progress towards multiple literacies in any domains and readiness to build any challenges in future.*

Keywords: *Game based learning, Computation, Intelligent data tool.*

Index Terms: *Intelligent Data, Gaming strategy, Sequencer Squar, literacies.*

I. INTRODUCTION

In general, everyone needs a platform to study, learn and understanding the concepts, towards the growth of digital era. One of the electronics field plays a vital role in the form of entertainment in TV. Further PCs, Laptops and mobiles are used as education tools to get the information and customized learning experiences. The electronics system deploys more interactive device/resource, has been used all over the world for their needs and requirements. Generally, it is hard to translate the knowledge about traditional classrooms to an online environment. Here a platform is developed for teaching through gaming technique. In recent years, these competences are fundamental for personal and professional development as they enhance anyone well-being and provide education and training opportunities [5].

It is a key level for more effective learning and reducing barriers in education field. Nowadays, Online Education and MOOC are part of the learning through technology mode of structure developed in higher education. Some dropouts may be happening, while the courses are running, due to the less interactive, doubts and basic requirements.Over the years, designers have explored many learning processes, but few strategy brought out for best results. Some time it may fails or leads to new model. Any user have put considerable energy into the design and implementation of experimental instructional programs. However, the fields support different literature and theory bases, communication is often lacking. Cognitive teaching model plays an important role to bring out new dimension for learning practice [7].To improve quality, access, and equity in education and training. A simple interactive tool developed for slow learners and fast learners. Identifying their strength, determines the course level. In this situation, game related workout is implemented and solving through interactive way of learning[4], how they can responds, responding few questions to make them to learn and grab the knowledge[3]. Easily identifies that level of learners, how they want to improve on their each and every stages of the course. Thus teaching models are just instructional designs. They describe the process and producing particular environmental situations which cause the student to interact in such a way that specific change occurs in his behaviour. The Collins framework of epistemic games [2] provides a structure and language to articulate what learning communities do when they work together to generate new knowledge. Such a framework can become useful to understanding classroom and workgroup processes, but it also can serve a prescriptive or heuristic role for teachers and designers. Many teachers complain that they want to teach critical thinking, but they have failed to find a suitable set of strategies.

Objective

Learning can be done through simplified game model. It is an easy way of an understanding the concepts and analysis through the set of sequence order.

II. IMPLEMENTATION

The proposed model consists of three modules, implemented through web based visual programming tool. First, Opener square box is simply called as OSB. An interface of the user, creates an identity which provides the access, intention of study, technical information are listed with simple questionnaires.

The second module which is called Smart Design Opener act as intelligent and smart design pad which consists of keypads representation listed from 1 to 9 Pads. Here the keypad touches each and every number of the pads gives the information guidelines. The sequential arrangement gives the clarity of subject model to propose and continuous review activity can be easily formed.

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ACCURATE AND TIMELY PREDICTION OF RICE CROP DISEASE BY MEANS OF MACHINE LEARNING ALGORITHMS

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Abstract

In Worldwide, India stood second in agriculture production. Agriculture plays a key role in Indian economy. These days, the main objective of agriculture not only lies in enhancing the cultivation but also to satisfy the end users with high quality goods. Rice pests and diseases are stipulating more importance day by day with the global changes. It leads concern on both global food safeties along with security of a major food crop worldwide. The small changes in availability may have heavy impact on prices as the rice global market is very low. Technical innovations need to be explored to meet the quality standards and ever growing rice demands. To achieve this, digital agricultural domain is focusing on enabling distinct applications by combining emerging technologies with the traditional techniques. The Proposed system mainly focuses on predicting the diseases in rice crop for pesticide management by utilizing machine learning algorithms such as J48, Naïve-Bayes and SVM. This study also presents the comparative results of these algorithms for disease prediction in terms of classification, prediction accuracy, time complexity and space complexity.

Keywords: *Classification, Machine Learning, SVM, J48, Naïve Bayes, Agriculture, Rice Crop, Disease Prediction*

1. INTRODUCTION

Environment plays a vital role in either increasing or decreasing the agricultural production. Climatic conditions are rapidly changing as a result of continuous changes in population, solid waste and pollution. In addition to these environmental factors, the crop development and growth also depends on soil properties, weather, ground and surface water availability. The affects of weather can be minimized with crop agronomic management like planting, applying fertilizers and irrigation. [3] For people belonging to many countries like Africa, Central and South America and some of the European countries, rice is their staple food source. Asian region produces and consumes more than 90% of World's rice. Organisms like fungi, viruses and bacteria are the causes for most of the paddy crop diseases. Most of the fungal diseases like Narrow Brown Leaf Spot, Brown Spot, Sheath Rot, Blast, Stack burn, Stem Rot, Sheath Blight, and Foot Rot, Bacterial diseases like Leaf Blight, Leaf Streak and Viral diseases like Rice Turgor and Rice Grassy Stunt are gaining importance in South and South-East Asia causing economic losses[1]. The fungus attacks the crop at all stages of crop growth [2]. Machine learning tools combined with Computer science and statistics are used to improvise the prediction analysis. Data scientists and data analysts use these modern techniques to foresee or to identify new relations in data. It became very difficult to manage the agricultural

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Irrigation Made Easy: Block Wise Filling Of Firm Filed Using WSN System

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Abstract: Agriculture is playing very crucial part in our everyday life and is a job of Farmers. Farmers follow some steps ladders to firm a field and one among is irrigation (is an essential step in the farming). Irrigation systems must inspire plant development while diminishing salt disproportions, leaf injuries, environmental conditions, and water loss. Loss of water will arise because of, wind drift, vaporation, run-off and water sinking deep below the root. To acquire noble results in irrigation we must use noble irrigation system. Now a days, farmers are using so many irrigation systems like traditional methods, modern methods and automated methods. Even though farmers facing problems to irrigate farm filed in sloppy areas. In this paper an automatic sensor based water pumping system is proposed to made irrigation easy to the farmers by dividing firm field into blocks and each block is monitored with soil moisture, temperate and humidity sensors to pump the water and the proposed method is more useful for irrigation in sloppy areas.

Keywords: Agriculture, Blocks, Irrigation, Pumping, Sensor, Slope Areas, Water, WSN.

1 INTRODUCTION

In Indian economy, Agriculture acting a vital part and is a work of farmers and farmers are responsible for the food we will eat daily. Farmers start work early, and in planting and harvesting season work till sunset. Even though modern agricultural equipment has made the work far less physically demanding than it was a few generations ago, most of a farmers are still preferring hands-on physical work. Farmers follow some steps in farming. In Farming life cycle essential step is irrigation. Active irrigation will affect the whole development process. The main motive to increase irrigation attempts is consistency. The manufacturer has a lot of governing over how to apply water and quantity of water to apply it. Over 70 per cent of the rural households depend on agriculture. Agriculture is an important sector of Indian economy as it contributes about 18% to the total GDP and provides employment to over 60% of the population. Indian agriculture has registered impressive growth over last few decades. The food grain production has increased from 68 million.[1] Agriculture is a job of Farmers and farmers are playing very crucial role in survival of human beings as they produce food and fiber for human beings. They make responsible usage of natural resources and advanced technologies to accomplish farming task. They have the ability to deal with different seasons, climatic variations, soil conditions, and the often harsh catastrophic events of wildfire, drought, and floods. In some areas farmers are very specialized in what and how they produce a limited number of products. Farming is an industry that depends everyday on the natural environment and the careful and responsible use of it. Without the conscious caring for the natural resources and wildlife any and all farming enterprises are doomed to failure. Farming practices often provide natural biologically active filter mechanisms for water as well as vegetative stabilization of soils. Farmers and farming societies offer an exceptional atmosphere to raise people.

They offer opportunities for young and old alike to gain experiences in basic lifelong values, an appreciation for success, as well as the heartache of life's most challenging occurrences.

Farming Life Cycle:

The following are eight essential steps followed by farmer to produce a food [2-3]

1. Selection of crop
2. Preparation of land
3. Selection of seed
4. Sowing of seed
5. Irrigation
6. Crop growth
7. Fertilizing
8. Harvesting

Irrigation is an important step in farming. Irrigation is nothing but amount of water to be given to the plants. We have so many tradition, modern and automated methods to irrigate the firm. But there is no such good method to irrigate the firm in slope areas. So, in this paper proposed a new method to irrigate a firm filed in slope areas.

2 LITERATURE SURVEY

The main motive to increase irrigation attempts is consistency. The manufacturer has a lot of governing over how to apply water and quantity of water to apply. To get good results in irrigation we should use good irrigation system. So many methods available for irrigations. In the following mentioned all traditional, modern and automated methods those using in present farming world.[2-3]

2.1 Traditional Methods of Irrigation

The following are the approaches of irrigation that were used in the past years. Even currently several minor farms in rural areas use these. Though they are inexpensive than the new

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Experimental study on vortex intensification of gravitational water vortex turbine with novel conical basin

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Counterfeiting Threats in IoT

Kayiram Kavitha, R.V.S Lalitha, T.V.Suneetha, D.Usha Sree

Abstract: ***With the advent of digitalization the entire world is greatly connected to the digital world. The modern gadgets are equipped with Internet-connectivity encouraging web browsing. Due to rapid mobility of devices numerous applications are launched while these come with lot of advantages and wide spread of information they are prone to attacks too. These attacks on IoT devices compromise the security & privacy of the user. The attackers get entry and invade through the data, inject malware, or schedule attacks on neighborhood. In this paper, we present the attacks and the vulnerabilities in IoT, along with the preventive and counter measures to be adapted to safeguard from attacks. We compiled a brief outline of the security breaches and the latest block chain application to implement security in IoT devices as work for future direction.***

Keywords : security, IoT devices, Block chain, threats, preventive measures.

I. INTRODUCTION

We are spectating a drastic change in life style. The technology is developing rapidly we witness a global exposure to our activities. Internet of Things (IoT) is interconnection of devices ranging from desktop to streetlights where every electronic device operated with some power source can be connected to form a network instantly thus each such device will have a unique IP address. As IoT has emerged in every walk of life ranging from Internet of Medical Things (IoMT), Internet of Battle Things (IoBT), and Internet of Vehicles (IoV) and so on.

With the evolution of Internet, wireless devices, Radio Frequency Identification (RFID), Wireless Sensor Network Technologies, Internet-of-Things (IoT) [1] has emerged as a concept to enable communication between heterogeneous devices (things or objects like sensors, actuators, RFID tags etc.). These IoT devices operate without a screen or user interface in a resource constrained environment usually dedicated to a single task. There are many constraints in IoT like battery power, memory space, and security as these devices are connected instantly with anything, anyplace and anytime. In contrast to traditional internet the IoT device is intelligently gathering, analyzing the human behavior [2]. The high connectivity of these intelligent objects leads to serious security issues.

Many IoT applications can be found in smart home, smart city, smart campus, smart grids, medical equipment, connected vehicles etc. According to Gartner report [3] the number of smart phones and tablets will reach up to 7.3 billion units by 2020. As a tremendous growth is observed in IoT, the communication network has challenges in terms of huge amount of data, processing power with energy consumption, security threats, and efficiency of cryptographic algorithms.

With the growing needs of the market and the technological evolution the manufacturers are in a competition for business and scooping up the new technology overlooking the security threats. As the IoT Manufacturers have not implemented a robust security system, the security experts have warned of the potential risks [4] of unsecured devices.

Now, we brief the security attacks on IoT devices reported in the past. There are many incidents of data breaches and attacks in the past and still happening. Many websites including Twitter, Netflix, Spotify, Airbnb, Reddit, Etsy, Sound Cloud and the New York Times, were reported inaccessible by users due to Distributed Denial of Service (DDoS) attack [5] through IoT devices on 21st October 2016. A botnet [6] consisting 100K compromised IoT devices launched a series of DDoS attacks that set records in attack bitrates in the year 2016. With rapid growth in IoT, the vulnerability and security threats for these devices have become a major concern. Some well-known remedies include firewalls and Intrusion Prevention System (IPS) [7]. The IPS monitors the geography using many machine learning techniques [8]. But, IoT require network connectivity to work and is too expensive and complex to maintain. Hence, light weight protocols are developed to maintain the internet connectivity. This makes it more vulnerable and easy for hacker.

It has been studied that the IoT market grows from 27 billion devices to 125 billion devices by 2030. This rapid growth calls for the device manufacturers to rush up and capture their sales. The device vendors are hence emphasizing on making profits ignoring the vulnerability and associated threats.

This gave a huge opportunity for attackers to intrude into the network. Many users are falling prey to such attackers and are losing trust in technology. Hence we intend to outline the attacks a detailed counterfeiting solutions using Block chain technology.

Smart city, smart home, smart TVs are rapidly flourishing their presence in the community, so is the increasing concern for their security as shown in Figure 1. Many of these devices come with a built in firewall, antivirus etc. But the user behaviour and cookies pose a privacy threat which is often over looked by the consumer.

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Ordered Local Binary Pattern (OLBP) For Classification of Textures

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Abstract: *Conventional Local Binary Pattern (LBP) methods follow the patterns whose rotations are lesser than two or certain limited numbers are called rotation invariant binary patterns. In the conventional rotational-invariant encoding method has disadvantage due to neglecting information of the some patterns by its process of encoding. It ignores the patterns when their spatial transition is greater than two for maintaining the rotation-invariant nature. But these disregarded patterns will plays crucial role and have very much more discriminative power. Here, the present study proposing a novel model called OLBP by changing (sorting) the order of consecutive binary patterns without disturbing the property of rotational invariance. The result observed by experiments indicates the proposed work shows better classification rate which is worked on the standard databases when compared to previous existing methods.*

Index Terms: *Texture; Neighborhood pixel; Local Binary Pattern (LBP); Histogram; Rotational Invariance; Classification;*

I. INTRODUCTION

This The classification of images based on their texture values is well known for the investigators and scientists in the area of digital image processing [1][2]. Surprisingly until now, there is no standard definition for the most important property of the image called "texture", which plays key role for deciding the classification criteria of the images.We can understand the texture as the arrangement or proper order of the pixels by their appearance such as surface of the material, natural scene and human skin and surface of stones or tiles. By understanding and analyzing these textures so many useful and real time applications including but the scope is not limited to stone, material, soil, wood and geographical area classifications. And the usage of texture analysis is for face re-cognition, age or gender classification and deceased leaf classification or quality grading of leaves and in mining soil/minerals recognition where human interaction is needed but difficult or impossible some times. Since the 1960's they are so many vide variety of techniques are developed for classify the textures based on certain criteria. There are four major categories of algorithms called statistical (or stochastic), mathematical, geometrical(structural), and signal processing methods proposed by Tuceryan and Jain [3]

A. Origin of LBP

First, The concept of Local Binary pattern (LBP) invented and introduced by Ojala [1] and Pietkain in the year 1999 as a mathematical approach. It calculates a value that find the amount of relativity within a 3x3 grid of neighborhood pixels by using a certain value called as threshold value that is replicated (or multiplied) with their corresponding weights.

$$LBP_{P,R}\ P,R \sum_{p=0}^{i} \sum_{p=0}^{p-1} s(g_p - g_c)2^p, s(x) = 1, if\ x \geq 0;$$

s(x)=0 ,if x<0;

Here, g_c represents gray level value of the central pixel, g_p value of its adjacent or neighboring pixels.
'P' is the total number of neighbor pixels participated.
'R' is the value of the neighborhood radius.
After obtaining the LBP pattern of each pixel, obtain the corresponding histogram is constructed to show the texture image.

$$Histogram(k) = \sum_{i=1}^{I} \sum_{j=1}^{J} f(LBP_{P,R}(i,j),k), k \in [0,K],$$

f(x , y) = 1, if x=y

= 0 in other case

Here, k represents max obtained LBP pattern value.

The U value is defined as total no of changes from 0 to 1 or 1 to 0 called spatially transition of bits in that pattern.

$$U(LBP_{P,R} = |s(gp-1-gc) - s(g0-gc)| + \sum_{p=1}^{p-1} |(gp-gc) - s(gp-1-gc)|$$

The pattern which has limited transactions (at maximum two) in the circular binary representation [1] defined as the uniform pattern.
Definition of locally rotational invariant pattern as given below:

$$LBP_{P,R}^{riu2} = \sum |(gp-gc) if\ U(LBP_{P,R}) \leq 2$$

= P+1 in other cases

The mappings obtained from LBP_{PR} to $LBP_{P,R}^{riu2}$ has p+2 outputs which are different can be implemented.(the output values referred from lookup table.)

B. Pros and Cons of LBP

Pros:

- It is very easy to calculate but efficient in performance.
- It has good discrimination power.
- It is very strong to monotonic gray scale changes occur.

In LBP not only sign component, from magnitude component also we get additional information.

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DECEASED LEAF IDENTIFICATION USING THE GEOMETRIC LOCAL BINARY PATTERNS (GLBP)

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ABSTRACT

Usage of classical Local Binary Pattern (LBP) for texture classification depending on the intensity changes of surrounding pixels around the each pixel in the image. Even though basic LBP is powerful, there are so many variations and applications by giving extensions and refinements to the basic LBP according to the requirement and nature of applications. But, in the proposed Geometric Local Binary Pattern (GLBP) technique instead of using closed neighbourhoods intensity oriented neighbourhoods intensity is considered. Actually, this is the one of the method which is variation of LBP and belongs to the family of Geometric Local Textural Patterns (GLTP). Here, the texture of the image classified by the help of GLBP histogram which is prepared from the occurrences of GLBP-codes obtained from the entire images. These type of identifications generally done by manually but it is time consuming and error prone. The major application of this process is to classify the images of leaves by considering the standard databases for identification of deceased leaves and observed better results.

Keywords: texture classification, local binary patterns (LBP), geometric local binary pattern (GLBP), geometric local textural patterns (GLTP).

INTRODUCTION

In the nature plants and trees are plays crucial role in our human life. The classification of the plants based on various criteria generally happens in the field of botanical sciences. In general, botanists classify the plants based on the fruits or flowers but they are seasonally or occasionally available. Majority of the researcher prefers classification of plants based on leaves because leafs are available irrespective of the seasons. Actually leaf classification by human inspection or by the manual procedures is the major challenge to the botanists and time consuming process because they compare and contrast the leaf based on the stored databases. By the new inventions arrived in the computer sciences especially in the field of Digital images processing or machine vision makes the above process very easy. Classification of tree leaf based on images is not new to the botanists. So many algorithms are available to search and find the leaf category [13] [14] [15].

In so many papers, Researchers introduce many number of novel techniques to classify the images of leaves based on their one of the important property called as "Texture". It is easy to identify but difficult to define. Surprisingly, until now there is no universally acceptable definition for Texture. But, it plays a important role in the classification and there are so many algorithms are developed. Roughly, we can understand the texture as distribution or repetitive arrangement of patterns (pixels) in a proper way. There are so many textures we can found in the nature for example surface of the water, leather of the animals (Tiger, Zebra), section of the trunk of the tree etc., bread slice, designed tiles and designed saris and cloths as some of the examples for artificially created textures.

Since the 1960's they are so many vide variety of techniques are developed for classify the textures based on certain criteria. There are four major categories of algorithms called statistical (or stochastic), mathematical, geometrical (structural), and signal processing methods proposed by Tuceryan and Jain [1]. Difference histogram and co-occurrence statistics are examples for statistical texture measures.

The second structured approach dealing with texture primitives (these are also called as textures or texons) these types of work well with macro textures.

CLASSIFICATION

The main purposes of the classification methods are divide the objects into most appropriate categories. Since there is no perfect classification method is there so we can take the help of probability concepts if need.

Actually there are two categories of traditionally classification techniques: parametric and non-parametric. In parametric classifier, make certain assumptions about the distribution of features. For example Bayesian classifier and Mahalanobis classifier. Where as in non-parametric classifiers can be used with arbitrary feature distribution of features and without assumptions about form of underlying densities for ex K-NN classifier.

A supervised classification process which involves two phases first one is the classifier must be presented with previously known training samples or other knowledge of feature distributions. The Local binary operator was first known as a complementary measure for local image contrast. The LBP operator worked with 8 neighbours of a pixel using the value of the central (middle one) pixel as the thresh hold value. An LBP for a neighborhood was given by multiplying the threshold

Intensifying the Security of Information by the Fusion of Random Substitution Technique and Enhanced DES

Rayi Sailaja, Ch. Rupa and A. S. N. Chakravarthy

Abstract Information security is the process of defending information from unauthorized access and loss. Nowadays in most of the organizations, information is accessed through online. So there is a need to safeguard the information from attackers and hackers. Cryptography is the method of storing and transmitting data in an unreadable form so that only indented user can read and process it. There are two categories of cryptography: symmetric key and asymmetric key encryption algorithms. Symmetric key algorithms use single key for both encryption and decryption. RC2, RC4, DES, Triple DES, IDEA etc. are some of eminent existing symmetric key algorithms. In this paper, we tried to enhance the security of DES, which is now considered to be insecure for many applications. We tried to provide double security by adding a random substitution technique before applying EDES algorithm where we modified the round function and increased the number of rounds from 16 to 32. The performance of the proposed technique is compared with traditional DES algorithm by means of avalanche effect and plaintext sensitivity.

Keywords Random substitution technique · Symmetric encryption · DES Round function · Avalanche effect

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A novel integrated approach using Euclid's and fuzzy logic for secure communication

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Abstract: Today, there is a terrific rise in internet security attacks. Even though many encryption algorithms are developed to fight against the attacks, most of them are key centric algorithms. The security of algorithm is very much dependent on security of the key. A new cryptographic algorithm has been proposed based on internal key table, Euclid's theorem and fuzzy logic. The proposed algorithm does not involve key exchange or sharing. It takes the help of internal key table whose indexes will be converted in to numeric form using Euclid's and fuzzy logic to get the cipher text. The secrecy of the communication will be compromised if the key is compromised. So there is a desperate need for key-less algorithms to thwart against man-in-the-middle and spoofing attacks. The proposed approach will provide a solution for key exchange attacks. The performance of proposed work is evaluated by comparing with existing approaches and it shows better results.

Keywords: fuzzy logic; Euclid's algorithm; key table.

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Biographical notes: Rayi Sailaja has 12 years of teaching experience and is currently pursuing her PhD from JNTUK, Kakinada. Her research areas are network security and cryptography, mobile computing and computer networks. She has presented her work in national and international conferences.

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Comparative study of synthesis, structural and magnetic properties of Cu^{2+} substituted Co-Ni, Co-Zn and Co-Mg nano ferrites

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ABSTRACT

Mixed ferrites of the form $Co_{0.5}M_{0.1}Cu_{0.4}Fe_2O_4$ (M = Ni, Zn and Mg) have been synthesized using the sol-gel auto combustion technique. Structural analyses are carried out using powder X-ray diffraction to identify the constituent phases. SEM analysis revealed clear crystal morphology with relatively uniform grain sizes with agglomerated structures. The FT-IR studies also confirm the bond formation and cation vibrations at low (365–392 cm^{-1}) and high (579–587 cm^{-1}) bands that correspond to the tetrahedral and octahedral sites, respectively. The magnetic properties studied through vibrating sample magnetometer showed that the Ni substituted sample has more magnetic character by exhibiting the highest saturation magnetization.

1. Introduction

Ferrites have immense technological importance especially in electronics. Such a huge importance of these materials is due to their unique electrical, dielectric, and magnetic properties. As a result, a wide range of applications including ferrofluids, magnetic drug delivery, microwave devices, information storage devices could be fabricated. Besides, the preparation of these ferrite materials is cost effective and simple [1–3]. The mixed ferrites have even more interesting properties and could be modified using different synthesis techniques. The wet chemical methods are more of simple and clean as compared to the conventional ceramic methods. The other synthesis routes include micro - emulsion, chemical co-precipitation, double sintering, etc., [4]. The polycrystalline ferrites exhibit very good dielectric properties and are applicable in the range of microwave to radio wave frequencies. Basically, the synthesis method and the sintering temperature will have an impact on the distribution of cations in the tetrahedral and octahedral sites which in turn affect the electrical and magnetic properties [5]. Beside the chemical compositions, the microstructures such as the grain size and porosity affect the electrical and magnetic properties as well. Lots of substituent elements have been tried to modify the structural, chemical, electrical and magnetic properties of ferrites [6–8].

In the present work, a comparative study of the effect of different cation substitutions in the $Co_{0.5}M_{0.1}Cu_{0.4}Fe_2O_4$ (M = Ni, Zn and Mg) materials have been reported. Each of these cations has its own impact on structural and physical properties. Obviously, since Ni is more magnetic material, it will enhance the magnetic properties of the material synthesized, whereas the other cations are nonmagnetic and so can enhance the dielectric properties rather. But the individual ferrites, for instance Ni ferrite, do have quite different properties. For example, the Ni ferrite exhibits high electrical resistance and low coercivity [9].

2. Experimental

2.1. Materials

Preparation of $Co_{0.5}M_{0.1}Cu_{0.4}Fe_2O_4$ (M = Ni, Zn and Mg) ferrites has been done by the sol-gel method auto combustion method. The precursors $Co(NO_3)_2.6H_2O$, $Ni(NO_3)_2.6H_2O$, $Zn(NO_3)_2.6H_2O$, $Mg(NO_3)_2.6H_2O$, $Cu(NO_3)_2.3H_2O$, $Fe(NO_3)_3.9H_2O$, and citric acid are weighed in required stoichiometric proportions and are dissolved in the minimum amount of distilled water. The individual solutions are then mixed together and the pH value is adjusted to 5–7 by adding NH_4OH solution. The solution is then burnt to self ignition to obtain a loose powder. The powders are annealed to 1000 °C in a muffle furnace for 3 h.

2.2. Characterizations

The powder X-ray diffraction (XRD) data of the samples has been collected on a Rigaku CuKα diffractometer with diffraction angles of

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Original Research Paper

Studies on structural, magnetic, and DC electrical resistivity properties of $Co_{0.5}M_{0.37}Cu_{0.13}Fe_2O_4$ (M = Ni, Zn and Mg) ferrite nanoparticle systems

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ABSTRACT

Ferrite nanoparticles of the composition $Co_{0.5}M_{0.37}Cu_{0.13}Fe_2O_4$ (M = Ni, Zn, and Mg) have been synthesized using sol-gel auto combustion method. Structural properties are investigated using powder X-ray diffraction technique and the results showed a pure spinel crystal structures of the synthesized materials with lattice parameters in the range of 8.3331–8.4793 Å. Crystallite sizes are calculated using the Scherrer's formula and the results are found to be in the range of 62.22–82.41 nm. The surface texture and morphological nature of the samples are studied by scanning electron microscopy which depicted clear crystalline nature of the materials. Characteristic vibrational states prevailing in the samples are studied using room temperature Fourier transform infrared spectroscopy. A two-probe DC electrical resistivity measurement of the samples showed a high resistive nature. Room temperature vibrating sample magnetometer measurements revealed the magnetic properties of the samples.

1. Introduction

Nanoparticles have brought a huge impact on technological applications. Ferrites are those groups of materials that could be availed in nanoparticle level. Not only such advantages of ferrites have let them be used widely in different electronic, microwave, telecommunication, and high frequency applications but also their smooth electrical, magnetic, dielectric and structural properties. The synthesis methods determine the structure and the physical properties of ferrites. Besides, the chemical composition also has a significant role in the behavior and applicability of these materials. The synthesis routes manipulate the cation site occupation in the structure of ferrites and hence influence the properties of these materials [1–4].

Mixed ferrites of the spinel structure have an interesting property as such to tolerate harsh environment due to their chemical and thermal stability. In addition, their tuned magnetic parameters made them the choice for making magnetomechanical devices. Moreover, due to their high resistive nature, they exhibit low loss of magnetic and electrical energies when used in high frequency applications [5–7]. We can consider Co-Ni, Co-Zn, Co-Mg, and so forth as mixed type ferrites and in our previous reports we presented studies on some of these ferrite materials [8,9]. Synthesis methods of ferrite materials include ceramic method, co-precipitation, sol-gel, hydrothermal, reverse micelle technique, etc. [10–12]. As reported in literature Ni-Co ferrite materials exhibit high magneto resistive properties which are useful in applications of magneto-resistive sensor devices [12]. The Co-Zn materials are used to prepare ferrofluids for thermomagnetic energy conversion, antenna cores, biosensors, high frequency devices, chemical drug delivery, transformer cores, and gas sensors [13,14]. The Co-Mg ferrite materials are used in high frequency device as the resistivity of these materials is high [15]. Such outstanding applications of these ferrite materials mentioned above raise curiosity of their further study and especially after obtaining interesting results in our previous work by substitution of copper [8].

The present report is concerned with substituting Cu^{2+} at lower concentration (i.e., synthesis of $Co_{0.5}Ni_{0.37}Cu_{0.13}Fe_2O_4$, $Co_{0.5}Zn_{0.37}Cu_{0.13}Fe_2O_4$, and $Co_{0.5}Mg_{0.37}Cu_{0.13}Fe_2O_4$) and studying the structural aspects, magnetic properties and DC electrical resistivity properties. Structural properties and phase identification

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A Novel Speech Compression Technique using Optimized Wavelet Transform to Improve the Quality of Auditory Perception under Low SNR Conditions

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Abstract - **Speech compression in poor environment, where the signal energy is weak due to acoustical disturbances, can improve the efficiency of transmission while reducing the bandwidth if intelligibility and/or quality can be preserved by selecting appropriate energy based wavelets. We propose an Optimized Wavelet Transform (OWT) to improve speech perception by incorporating masking techniques in the algorithm to reduce the noise effect. Adaptive Wavelet Selection followed by optimized quantization exploit a robust Dynamic Dictionary Scheme (DDS) to perform efficient compression while preserving speech intelligibility and perceptual quality. An additional lossless coding technique inevitably increases the compression ratio while preserving the quality of the signal. Finally, decompressing the compressed signal undergoes tonal and noise masking by applying a global threshold based on Sub-Band Perceptual Factor (SBPF) and Perceptual Entropy (PE), which improves the quality of the signal. Performance of the proposed algorithm is obtained in terms of Normalized Root-Mean Square Error (NRMSE), Compression Ratio (CR), Performance Evaluation of Speech Quality (PESQ), Re-construction Distortion Length (RDL), Signal to Noise Ratio (SNR) for various voiced and unvoiced signals recorded in low SNR conditions. All the signals are derived from NOIZEUS data base and some samples are recorded and normalized to operate at sampling frequency of 8KHz.**

Keywords - speech compression, optimized wavelet transform, auditory perception quality, low SNR

I. INTRODUCTION:

In the last few years, there has been exponentially up surge in multimedia data communication over transmission network thus demanding more efficient transmission paradigm while preserving the quality constructs of the original data. Speech signal has always been a dominating signal for communication that demands quality communication inevitably over communication network, even under low Signal to Noise Ratio (SNR) conditions. The limited number of channels available for cellular and telephone services put a demand before the researchers to concentrate on storage and transmission equipment, which drags the necessity of speech compression under the acoustical disturbances. According to Harshalata Petkar [1], DWT is the lossy compression technique for speech compression used to solve the problem faced by Palestinian cellular company, Jawwal for accommodating more users, without varying the parameters of the speech. P.M. Kavathekar et al., identified the necessity of speech compression in real – time scenario and implemented the same using FPGA. But DWT as it is a lossy compression techniques it retains detailed coefficients and decompressed signal is reconstructed from those coefficients by making other coefficients to be zero increases the compression ratio at a compensation of intelligibility/ quality of the signal [2]. Undeniably, there is an array of applications environment where identifying original signal under high disturbances or noise is must. M. Herrera et al., developed a perceptual audio compressor with a remarkable compression ratio using time-frequency localization based on principles from psychoacoustics and information theory [3].

These all key factors make it inevitable to develop a robust audio processing mechanism or vocoders to enable quality speech or audio communication. Speech compression is one of the broad research domains which often provide a broadened horizon for improvement and innovation. A major objective of speech compression is representing the speech signal with few bits by removing non – essential signals so that the reconstructed signal quality should be acceptable [4]. Compressive Sensing (CS) gives inbuilt compression, sensing & security to signal in just one single step reducing complexity & storage, but reconstruction quality is traded with available processing power at decoder [5-7]. Maher K. Mahmood Al-Azawi et al., proposes chaotic encryption with large key size along with compressive sensing to improve the compression ratio further [8]. Though, numerous efforts have been made on exploiting efficacy of the algorithms such as Linear Predictive Models, Discrete Cosine Transform, classical Fast Fourier transform etc., to perform speech compression, it has been still an open research area to augment existing systems or develop more efficient speech compression paradigm.

With this motivation, in this research work a highly robust and novel Optimized Wavelet Transform (OWT) based speech compression technique has been developed. Unlike classical wavelet techniques in the research work EWT comprising Adaptive Wavelet Selection (AWS) is developed followed by Optimized Wavelet Coefficient Quantization (OWCQ). These two key contributions (i.e.,

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Transformation based Speech Compression for improving speech perception under low SNR conditions

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ABSTRACT

Compact form of representation of speech while preserving the intelligibility of the signal for listener's perspective perception in any acoustical disturbance is creating a platform for research in present day communication. Speech coding and transmission over VoIP according to ITU-T standards is still advancing in improving the compression ratio. But in the real-time scenarios like mobile communications in noisy environment still drag the concentration of researchers to improve the quality of the signal in listener's perception while preserving the transmission bandwidth. The proposed adaptive transformation and coding technique is inevitably suitable in real- time scenarios because of its computational efficiency and its quick response. The noisy speech signals are considered from Noiezus database with 8KHz sampling frequency over 30 samples with initial SNR of 0dB, 5dB, 10dB, 15dB. Adaptive Fast Fourier Transformation technique is used for speech compression and coding by rescaling the samples of FFT. The performance of the proposed technique is measured in terms of Short-term Objective Intelligibility (STOI), Reconstruction-Distortion Length (RDL), Peak Signal-to-Noise Ratio (PSNR). Furthermore, the speech intelligibility scores are compared with unprocessed speech under various noisy conditions. The results show large intelligibility improvements with the proposed method over the unprocessed noisy speech.

Keywords: FFT, PSNR, Speech intelligibility, compression ratio, STOI, RDL

1. Introduction

Compressing the environment effected speech signals is a crucial issue in day-to-day mobile communications. The listener centered speech processing is inevitably required in those situations. The presence of additive background noises like babble, car, ignition, exhibition,

IOT BASED REAL TIME EARLY WARNING BUS INFORMATION SYSTEM TO STUDENTS BY EMAIL

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Abstract: This paper describes about the implementation of early warning bus information system to the students in real time based on IOT using email. It is aimed to provide college bus information regarding next arrival stop and live running status of bus to the students who are related to the respective bus. This system is implemented by using Raspberry pi that access GPS co-ordinate by GPS module interfaced to it. .The complete system algorithm implemented by using Python, and entire control system built using ARM1176JZFS microcontroller. This system used in wide application areas where information regarding live running status of bus needed by passengers in real time.

IndexTerms **- Raspberry pi, GPS, Python.**

I. Introduction

Now, this is the age of speed, everything is happened in the speed of supersonic, and the data can be transferred at the speed of light in digital medium. Hence there is need of information inflow the same speed. This paper aimed to provide college bus information to students fast enough students always experienced in waiting at the bus stops for arrival of bus and also encounter. So many times there will be missing the bus due to lack of information regarding arrival to their respective stops. This problem which reduces the human intervention for getting college bus information.

This paper describes about implementation and deployment of system which provide college bus information to the students. The system which is placed in bus consists of GPS for continuously tracking the location of bus. Once the bus arrived at a bus stop the information about next bus stop sends email alert to students who are registered for their respective stops. This system uses controller interface with Raspberry pi which is low cost and consumes smaller amount of power, when bus arrives at the stop, Raspberry pi access GPS co-ordinate by GPS module interfaced to it, Raspberry pi compares accessed and already saved GPS coordinates and follows SMTP protocols to send email alerts. The complete system algorithm implemented by using Python, and entire control system built using ARM1176JZFS microcontroller. The system tested and implemented at college level instruction. This system used in wide application areas where information about bus needed by passengers.

II. Existing Method:

In today's world, time is money. Because of the unpredictable traffic conditions these days, the people using chartered bus services waste precious time waiting for the bus at their respective stops. So there is a need for an early warning system, for the approaching transportation vehicle. This early warning system would provide automatic alerts to passengers corresponding to their respective bus stops. These alerts would be in the form of SMS to the passengers on their registered mobile numbers. So the passengers can reach their stop just in time and board the bus without any waiting.

The alert system would be fully automatic without any need for interaction with the bus driver or passengers. The passengers would only need to register on a central website their mobile number, the bus for which they would like to get the alert, their stop and the time when they would like to get the alert.

Due to rapid increase in population, there is need for efficient public transportation system. There is increased burden on public transportation like bus just because of population. Therefore remote user needs a smart system which provides real time information of bus. So we proposed a new system which solves the drawback of current public transportation system. So our systems handle all the data like current location of bus, management of buses and its schedule. The real time tracking of bus can be done by our proposed system and this information is then given to remote user who wants to know the real time bus information. Some technologies like GPS (Global Positioning System), Google maps and GPRS (General Packet Radio Service) are used for development purpose. Our system provides web based application, which gives real time location of bus on Google maps to remote user.

The drawbacks of existing work are as follows: It is not comfortable for users who need proper time management system, no speed of data transmission and the above existing method is not applicable for real time purpose.

III. Proposed Work:

The proposed system provides the relevant information regarding all the bus numbers going from user's source & destination along with the route details, real time location. Generally the early warning system illustrated in the figure.1 is operated by GPS which is attached with the bus. Firstly GPS receives the satellite signals and then the position co-ordinates with latitude and

SMART WEARABLE DEVICE FOR CHILD PROTECTION

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ABSTRACT:
This paper discusses the concept of a smart wearable device for small children. The purpose of this device is to help the parents to locate their children with ease. To make communication medium between the child's wearable and the parent easy, GSM mobile communication is used. parent can send a text with keywords such as "LOCATION", "TEMPERATURE ","UV", "SOS", "BUZZ". The wearable device will reply back with a text containing the real time accurate location of the child which upon tapping will provide directions to the child's location on Google maps app and will also provide the surrounding temperature, UV radiation index so that the parents can keep track if the temperature or UV radiation is not suitable for the child. The secondary measure also used in this project is people present in the surrounding of the child react for the child's safety till the parents arrive and locate them. This secondary measure performed by using a bright SOS Light and alarm buzzer present on the wearable device which activated by the parents via SMS text should display the SOS signal brightly and sound an alarm. Hence this paper aims at providing parents with a sense of security for their child.

Keywords-IoT, Children, Arduino, Safety, UV,SOS.

I. INTRODUCTION

The Internet of Things System (IoT) [1] refers to the set of devices and systems that stay interconnected with real-world sensors. The motivation for this wearable comes from the increasing need for safety for children in current times as there could be scenarios of the child getting lost in the major crowded areas. This paper focuses on the key aspect of; the lost child can be helped by the people around the child and can play a significant role in the child's safety until reunited with the parents. The platform of this project will be running on Arduino Uno microcontroller board based on the ATmega328P, and the functions of sending and receiving SMS, calls and connecting to the internet which is provided by the Arduino GSM shield. Also, additional modules employed which will provide the current location of the child to the parents via SMS. The second measure added is SOS Light indicator that will be programmed with Arduino UNO board to display the SOS signal using Morse code. Therefore alerting the people around the child that the child is in some distress and needs assistance as the SOS signal is universally known as the signal for help needed. Additionally, the wearable comes equipped with a distress alarm buzzer which sets to active by sending the SMS keyword "BUZZ" to the wearable. Hence the buzzer is loud and can be heard by the parent from very considerable distance. Also the parents via SMS can receive accurate coordinates of the child, which can help them locate the child with pinpoint accuracy. Therefore, the proposed wearable device will communicate with parent via SMS which would ensure that there is a secure communication link.

II. SYSTEM DESIGN AND ARCHITECTURE

This section discusses the architecture and the design methodologies chosen for the development of the Child Safety wearable device.

A. System Overview

An ATmega328p microcontroller controls the system architecture of the wearable with an Arduino Uno boot- loader. A 5 pin header allows for power (+3V) and ground connections as well as providing access to TX, RX, and reset pins of the ATMega328p. The Arduino Uno collects various types of data from GPS module The GSM shield is used as an interface to send the data received by the Arduino Uno via SMS or MMS to a smart phone over GSM GPRS. The GSM shield functions as a trigger for the Arduino Uno to request data from its various modules.

If an SMS text with distinct characters is sent to request the current location or GPS coordinates is sent to the Arduino GSM shield via the user's smart phone, then the GSM shield triggers the Arduino Uno to request the current GPS coordinates.

RESEARCH ARTICLE OPEN ACCESS

RASPBERRY PI BASED PASSENGER CAR FOR ROAD SAFETY

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Abstract:

Nowadays world's major health and injury prevention problem is "road accidents". According to World Health Organization (WHO), more than one million children are killed in road accidents in every year, across the world. The motivation behind this project is to make a raspberrypi based passenger car that makes the passenger's journey even saferand more secure. This project handles the road discipline such as speed control in specific areas and Horn control in horn prohibited zones. The features involved in this proposed system are Vehicle speed control in school zone, bridges, cities, highways and suburbs. Horn control of vehicle is also included for No honking zones such as hospitals, schools, public libraries and courts. Alcohol detector is also there to prevent drunken driving.

I. INTRODUCTION

Road traffic crashes are one of the world's largest public health and injury prevention problems. According to the world health organization (WHO), more people die on roads in India than anywhere else in the world. At least 13 people die every hour in road accidents in our country; the latest report of the National crime Records Bureau reveals. In 2007, 1.4 lakh people in India lost their lives in road mishaps. Improper road infrastructure, failure to follow the speed limits, an increase in drinking and driving habits are among the major factors contributing to deaths from road crashes. WHO said in its report on 'Decade of action for Road Safety 2011-2010'. Currently Road safety systems are available in high end luxury cars such as Audi, Mercedes Benz etc. to name a few. Example: On Star Corporation provides subscriptions-based communications, in-vehicle security, hands free calling, turn-by-turn navigation, and remote diagnostics systems throughout the United States, Canada and China Turn-by-Turn Navigation, and Roadside Assistance.

The motivation is an attempt to make an embedded system to bring a Positive difference in the field of road accidents such as breaking traffic signals and drunken driving. It also has a major objective of exercising road discipline such as speed control in different areas and horn control in horn prohibited zones.

This paper presents Vehicle Speed Control in Variable Zone-in this feature; speed of the vehicle is controlled in different areas such as flyovers, bridges, highways, schools, cities and suburbs.

Horn control of vehicle in No Honking Zone-Controlling unwanted disturbances in horn prohibited zones such as hospitals, public libraries, courts, schools etc.

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Design and Implementation of an IOT based Efficient and Intelligent Smart Bins by using Raspberry Pi

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ABSTRACT: Nowadays people are using smart phone to pay their electricity bills, buy vegetables, book transp ticket, Order accessories. But those are all done for an individual need. In this paper we used that smart for the welf of the society. Overflowing garbage bins is a cause of concern for residents in developing countries. With the existe of many deceases in our nation, the open containers are proving to be a breeding place for germs. Traditiona municipalities operate on weekly routes to pick up wastes in the garbage bin on designated days but regardless whether the containers re full or not. This paper aims to optimize waste collection and to maintain the cleanliness of area. The aim of the paper is to control the waste management system by using internet. Internet of things (IOT) is concept of basically connecting any device with an on and off switch to the internet. This project connects the trash to the internet. It will update the status of the trash can to the user so that the garbage will be cleaned earlier to overflow stage. This smart trash can has two ultrasonic sensors. Which are used to find the level of the garbage in trash can. If the level reaches the threshold value then the Raspberry Pi model will send message to a mob application as well as to an IOT cloud.

KEYWORDS: Raspberry Pi, IOT cloud, Smart bin.

I. INTRODUCTION

Waste management is all the activities and actions required to manage waste from its inception to its final dispo This includes collection, transportation, treatment and disposal of waste together with monitoring and regulation. Wa collection methods vary widely among different countries and regions. Domestic waste collection services are oft provided by local government authorities. Curbside collection is the most common method of disposal in mo countries, in which waste is collected at regular intervals by specialized trucks. Waste collected is then transported to an appropriate disposal area. Nowadays, cities with developing economies experience exhausted waste collecti services, inadequately managed and uncontrolled dumpsites and the problems are worsening. Waste collection meth in such countries is an on-going challenge and many struggle due to weak institutions and rapid urbanization. By 20 almost two-third of the world's population will be living in cities. This fact requires the development of sustainab solutions for urban life, managing waste is a key issue for the health. Efficient and energy-saving waste managem reducing CO2,air pollution and vehicle exhaust emissions—these are just a few examples for the demands of fu cities. In views of that, the efficient use and responsible handling of resources become more important. Effectiv managing waste is important in developed countries. Waste management may swallow up to 50% of a city's budg but only serve a small part of the population. Sometimes, up to 60%of waste is not being collected; it is often simp burned by the roadside. It can pollute drinking water; it can spread disease to people living nearby. Even with g route optimization, the worker must still physically go to the dustbin to check waste levels. Because of this, trucks oft visit containers that do not need emptying, which wastes both time and fuel. Waste management prevents harm human health and the environment by reducing the volume and hazardous character of residential and industrial wa Improving proper waste management will reduce pollution, recycle useful materials and create more green energy.

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The effect of electron beam irradiation on physicochemical properties of potato starch

N. Rajeswara Rao, B. Sanjeev Rao, S. V. S. Ramana Reddy, and T. Venkatappa Rao

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Thermal properties of Polypropylene/Strontium Carbonate ($srco_3$) Nanocomposites

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Abstract
The aim of the present study is to analyze the thermal behavior of thermoplastic polymer matrix of polypropylene (PP) incorporated with Strontium carbonate ($SrCO_3$) nanoparticles. $SrCO_3$ nanoparticles were synthesized and reinforced in polypropylene (PP) polymer matrix in order to prepare PP/$SrCO_3$ nanocomposites with filler loadings of 1%, 3%, 5% & 10% wt. of PP by melt-mixing method. Confirmation of nanocomposite formation was obtained by SEM micro graphs. In fact thermal studies play a vital role in various applications of nanocomposites. Thermogravimetric (TG) analysis showed an increase in the thermal stability of the resultant nanocomposite. However, differential scanning calorimetry (DSC) results indicated a decrease in degree of crystallinity of the nanocomposite following filler content. The studies have revealed that a considerable change in the degree of crystallinity and a good thermal stability was observed at $SrCO_3$ filler loading of 5% wt. of PP when compared to other filler loadings for enhanced properties and applications.

Keywords: Strontium Carbonate Nanoparticles, Polypropylene, Thermal properties, morphology.

1. Introduction

Researchers are struggling in designing light weight and high strength materials for decades. Toughening process involves Stress concentration and de-bonding of the polymer nanocomposites[1]. Nanocomposites containing MWNTs with low filler loadings exhibit the enhanced properties compared to the conventional materials [2][3][4][5]. The enhanced properties are possible with only nanocomposites containing uniform dispersion of the nanoparticles in the polymer matrix[6]. But same filler of macroscopic particles of same kind cannot produce such enhanced properties[7][8]. Recently over the other traditional polymers, polymer nanocomposites are attracting the attention of the researchers and industry[9]. In fact in nanocomposites inorganic filler particle will act as stress concentrator [10]. TiO_2 nano-particles, silver nano-particles, gold nano-particles and zinc oxide nano-particles etc; are used as fillers in various nanocomposites for desired applications[11] [12]. Because of the highest growth rate PP is the most commonly used commodity plastic. $CaCO_3$ is the most commonly used inorganic fillers in thermoplastic polymer like PP Among several fillers, PP composites find wide range of applications like sewer pipes, garden furniture etc;[14]; Calcium carbonate nanoparticles could able to improve thermal and mechanical properties of polypropylene. According chen

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Structural, Morphological Properties of Polypropylene/Strontium Carbonate ($Srco_3$) Nanocomposites

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ABSTRACT

The present study aimed to investigate the effect of incorporated nanoparticles of Strontium carbonate ($SrCO_3$) on structural and morphological properties of thermoplastic polymer matrix polypropylene (PP). Strontium carbonate nanoparticles were synthesized and reinforced in polypropylene matrix in order to prepare PP/$SrCO_3$ nanocomposites with filler loadings of 1%, 3%, 5% and 10% weight of PP by melt-mixing method. The formed $SrCO_3$ nanoparticles size ranging from 6–9.8 nm was calculated by XRD analysis. The XRD findings are in good agreement with SEM results. Confirmation of nanocomposite formation was obtained by FTIR studies. The studies have revealed that a considerable change in the morphology was observed at $SrCO_3$ filler loading of 5% weight of PP when compared to other filler loadings for enhanced properties and applications.

Highlights

- First report on the synthesis of nanocomposites based on polyolefin's incorporated with $SrCO_3$ nanoparticles.
- Structural and morphological studies were carried out with XRD, SEM and FTIR.
- SEM studies were in agreement with XRD reports.
- PP/5% $SrCO_3$ was found to be the better composite, which has the potential to exhibit good enhanced properties.

Keywords: Strontium Carbonate Nanoparticles, Polypropylene, morphology, nanocomposites.

INTRODUCTION

Designing light weight and high strength materials has become a challenge for researchers for decades. Stress concentration and de-bonding are the key parameters involved during the toughening process of the polymer nanocomposites [1]. Nanocomposites containing low filler loadings like carbon nano tubes and MWNT's exhibited the desired properties compared to the conventional materials [2-5]. Such desired properties could be exhibited when there is a uniform dispersion of the

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Eccentric operation of STATCOM Using Predictive Controller

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STATCOM

ABSTRACT

The impact of multilevel converter STATCOM in transmission and distribution system is given high importance. Increment of number of switches in multi-level cascaded H-bridge converter, made it more vulnerable to open circuit and short circuit faults. To reduce the effect of faults on line voltage magnitude, in this paper an advanced improved predictive controller is used to generate PWM pulses for the power electronic devices. A Cascaded H-bridge STATCOM, interconnected to a distribution system with linear and non-linear loads. The feedback control structure of STATCOM has an advantage of reducing THD and controllable reactive power. A switch fault detection and elimination method is proposed with a bypass switch connected to each H-bridge to surpass the faulty H-bridge. The complete analysis with all control structures is designed in MATLAB/Simulink representing dynamic graphs and feasibility of proposed method is verified.

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1. INTRODUCTION

Power quality maintenance is of major problem to be solved with the increase of load demand. Many loads connected to distribution grid consume active power and also high reactive power with reduction of power factor of the main source. To maintain the power factor of source, reactive power drain from source has to be decreased with a supplement device connected to the distribution line. So, that the reactive power demand of the load can be compensated with the device and source supplies only active power, with negligible reactive power drain. This makes the active power equal to apparent power increasing the power factor of the source to unity. Voltage sags caused due to sudden change of loads can also be eliminated with increase of the total apparent power of the system, supporting the loads even in high demand conditions.

The device used to inject reactive power into the grid can be a STATCOM [1]. This FACTS device is capable for Voltage Regulation, Shunt Compensation and Powerfactor improvement. STATCOM controls line flow without disturbing thermal limits, stability margin etc. keeping losses minimum. Many research papers have been published on Multilevel converter based STATCOM with Convetional controllers like PI, carrier based techniques and Spacevector PWM. Each controller technique has it's advantages and disadvantages. PI controllers were easy to design and compute but lack of dynamic performance in wide range with trial and error method. SVPWM is of more computational complexity and harmonic distortion, instead they had good dc-link utilization.

This paper presents a simple predictive current controller[2], proposed for multilevel converter to deliver power to the (un)balanced/(non) linear loads[6]. The paper is organized as follows: Section 2 explains the proposed predictive controller scheme. Section 3 explains in detail the fault identification and mitigation modelling. Section 4 presents simulation results after the installation of STATCOM in the Test system.

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Effect of Compression Ratio on Nano-Particle Doped Fuel Blends in Unmodified Research Engine

H. Suresh Babu Rao, Dr T. Venkateswara Rao & Dr K. Hema Chandra Reddy

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EFFECT OF EXHAUST GAS RECIRCULATION ON NANO-PARTICLE DOPED BIODIESEL AND DIESEL BLENDS FUELED DIESEL ENGINE

H. Suresh Babu Rao, T. Venkateswara Rao & K. Hema Chandra Reddy

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Influence of Injection Timing on Cerium Oxide Nanoparticle Doped in Waste Cooking Palm Oil Bio-Diesel and Diesel Blends Fueled in Diesel Engine

H. Suresh Babu Rao, T. Venkateswara Rao & K. Hemachandra Reddy

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Investigation on Properties of PET and HDPE Waste Plastic Concrete

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Research paper

A Comprehensive Study on Mechanical Properties of Nominal Grade Concrete Using Copper Slag as Partial Replacement to Fine Aggregate

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Abstract

Currently situation, improvement of infrastructure has created an excessive demand for herbal sand, which makes it greater expensive and leads to environmental imbalances. The utilization of suitable sustainable choice materials proves that it is the most efficacious choice to traditional concrete materials and can take care of the surrounding environment. Copper slag is an industrial byproduct of copper production. Copper slag is a high-gravity glassy granular material. This paper reports some experimental studies on the outcome of partially changed sand from impact of copper slag on the mechanical houses of concrete. M30 concrete adopts copper slag plan and partly substitutes high-quality combination fines by means of 0%, 10%, 20%, 30%, 40%, 50%, 60%, 80% and 100%. The mechanical properties of concrete measured in the laboratory encompass compressive strength, split tensile strength and bending tensile strength. The have an impact on of partly replacing the quality aggregates with copper slag on the compressive strength, the cut up tensile power of the cylinder and the bending power of the prism has been evaluated. Water absorption assessments have been also conducted to report the impact of copper slag on the absorption price of concrete. Test results affords that it is feasible to utilize copper slag as best aggregate in concrete.

Keywords: compression strength test; concrete; Copper slag; fine aggregate; replacement; split tensile strength

1. Introduction

The utilization of industrial waste or secondary materials promotes the manufacture of cement and concrete in the construction sector. Various industries are producing new by-products and waste. Dumping of waste can cause environmental and fitness problems. Therefore, reuse of waste is a large plausible for the concrete manufacturing. For many years, by-products such as fly ash, silica sinks, and slag have been regarded as waste. Concrete made of this fabric suggests elevated operability and sturdiness compared to everyday concrete and it has been used for the construction of electric powered power, chemical vegetation and underwater structures. In present day decades, in-depth research has been geared up to discover all viable methods for reuse. Copper slag is received as waste from the waste industry. Conduct a survey to explore the possibility copper slag as a substitute for sand in a concrete mixture. In the current situation, automobile effusions and sand extraction have grown to be a foremost concern due to environmental risks and serious imbalances in the ecosystem.

Some studies have been conducted to limit the serious have an effect on on the environment, using by-products such as copper slag as a partial alternative for great aggregates. There are a number experiences in utilizing copper slag as a subdivision of pleasant aggregates. Copper slag is a substance that is considered as waste. It can have a shiny future in the construction enterprise and can partly or completely change cement or aggregate. It is a derivative of the copper smelting and refining process. About 2.2-3.0 lots of copper slag is processed as a derivative when producing one ton of copper. At present, Nissan has about 2,600 tons of copper slag, with a cumulative whole of about 1.5 million tons. [1] If we can make use of copper slag alternatively of natural sand, then we can successively acquire an alternative to sand, which is an environmentally friendly and within your budget material.

2. Literature Review

Leema Rose & Suganya examined Copper slag as a partial replacement for concrete fines in terms of strength and durability .The main purpose of this research was to perceive the strength and durability of concrete, where copper slag was used to partially replace 10%, 20%, 30% and 40% of the fine aggregate. Their conclusion is that adding copper slag to the concrete will increase the density of the concrete. The compression test results presents that the percentage of copper slag added to the strength of concrete is increased by 30% relative to the weight of the fine aggregate, and the copper slag strength of the design mixture 1 is 45.42 N/mm2. 1:4:2.6 to maintain the W/C ratio of 0.4 [2]. Srinivasu, Kranti, Nagasai, and Saikumar studied the compressive strength properties and effects of copper slag as a partial substitute for concrete fines. Using two different types of concrete grades M30 and M40, the copper slag replacement rates range from 0 to 100%. The percentage of sand rearrangement is 0%, 10%, 20%, 30%, 40%, 50%, 60%, 80% and 100%. After the mold was cast, the compressive strength of the concrete was tested for 7 days and

Video watermarking with Curvelet Transform

K.Meenakshi, Padmavathi Kora, D. Kishore

Abstract: In wireless communications, secured transmission of video has gained considerable research interest. The traditional wavelets are poor in handling curve singularities. Therefore, to handle them curvelet transforms are used. This transform exhibits minimum mean square error between the original and reconstructed image. Therefore, in this work, a watermarking is proposed with this transform using quantization index modulation. The watermark is embedded in the low resolution part of curvelet coefficients using dither quantization. To provide security, the mark is enciphered with Toral Amorphism. The algorithm is blind and the experimental results confirms that the proposed watermarking scheme offers high imperceptibility at the same time robust to attacks such as rotation, blurring due to camera motion and H.264 compression. To evaluate the performance of the watermarking scheme performance metrics Peak Signal to Noise ratio (PSNR) and Normalized Cross Correlation (NCC) are used in the work. The proposed algorithm is compared with recent works and the proposed algorithm offers high invisibility and resistance to attacks.

Index Terms: Curvelet transform, H.264 compression, Dither quantization, PSNR, NCC

I. INTRODUCTION

Nowadays there is a widespread diffusion of digital video based applications such as video conferencing, video chatting, video gaming, wireless video and internet video etc. [1]. It has resulted misuse of video content by violating the copyrights of original recipients of work. To address this and to provide security to the multimedia documents, watermarking is evolved as a viable solution [2]. In video watermarking, a signature called watermark is integrated in host multimedia video to obtain watermarked video. The distortion introduced by the signature must be minimal and there is no perceptible distinction between watermarked and host video. Therefore, watermarking the video content helps to protect the rights of content owners and provide a trace of misuse in multimedia documents. Watermarking techniques are classified in to two types based on the requirement of host video for watermark recovery [3]. If the watermark recovery requires frames of watermarked video in addition to host video then it is called non-blind watermarking [4]. To extract watermark in blind method, host video is not required [3]. This section presents application of transform domain techniques in digital video watermarking. In our previous work, a phase video watermarking [2] is proposed with DFT.The advantage of this method is watermark concealed in the phase is more robust to attacks and is imperceptible. However the DFT has bottleneck of not handling point singularities [2]. Another watermarking scheme is proposed

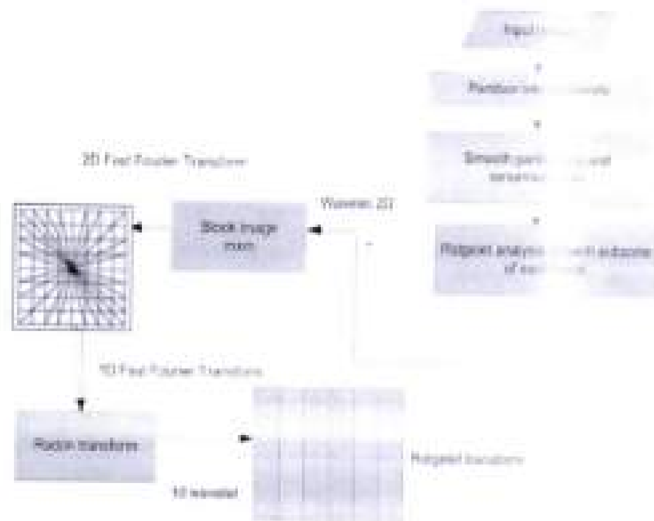

Fig 1. Steps in Curvelet transform

based on Complex Conjugate Symmetric Sequency Hadamard Transform [5].Though this watermarking scheme has an improved advantage of less hardware requirement, it is also poor in handling point or curve singularities. Another watermarking scheme is proposed by [6] based on Bi-orthogonal Wavelet Transform using Artificial Bee Colony Optimization (ABC). The optimization algorithms are generally suffered with the high computational complexity. Moreover, it cannot handle curve singularities. Due to these limitations, we proposed a watermarking using curvelet transform.

II. PRELIMINARIES

This section briefly describes the Curvelet transform as given below

A.Curvelet Transform

It is a multi-scale transform developed by Donoho and Candes [7]. The important feature of this transform is that it can pack edge information in fewer coefficients and the theoretical results show an edge to squared error 1/N requires 1/N Wavelet coefficients. On the other hand Curvelets requires only $\frac{1}{\sqrt{N}}$ coefficients [8]. . In 2-dimensional space and image is represented in spatial coordinates x, y and its corresponding frequency coordinates by F (U, V). The polar coordinates in frequency domain is represented by $r=\sqrt{U^2+V^2}$ and phase $\theta=\tan^{-1}\frac{U}{V}$.

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RESEARCH ARTICLE OPEN ACCESS

PIFA Antenna for Wireless Communications

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Abstract:

PIFA is abrivation of planar inverted antenna is actually a patch antenna where a shorting pin is introduced. An implantable compact planar inverted antenna designed for wireless telemetry is being proposed for operating in Australian ISM band of 900 MHz and 915-928 MHz IN wireless telemetry pifa antenna was designed and which is explained in this paper..PIFA antenna can also designed for testing antenna inside living body. The PIFA antenna is basically developed from the monopole antenna, Inverted L is realised by folding down the monopole in order to decrease the height of the antenna at the same time maintaining identical resonating length. When feed is applied to the inverted L, the antenna appears as inverted F as shown in figure. Also the addition of a shorting pin between the ground plane and patch planes increases the effective size of the PIFA antenna, thus further reducing the physical dimensions .In this paper i am going to compare it with the two types of feeding techniques i.e. line feeding with coaxial feeding.

Keywords- PIFA, HFSS.

I. INTRODUCTION

Planar Inverted F Antenna (PIFA) is a linear Inverted F antenna (IFA). In order to increase the Bandwidth and resonating frequency, the radiator element is replaced by a plate. PIFA which has reduced backward radiation enhance antenna performance in terms of gain and minimizes the wave produced due to power absorption. It has maximum gain in terms of polarization states like horizontal and also vertical. By chaging the height, length, width of the ground plane the bandwidth can be tuned. To decrease the quality factor and to boost the bandwidth, many slits can inserted in the ground plane. In medical applications, the main aim is to reduce the size of PIFA antenna maximum.

II.EXISTING SYSTEM

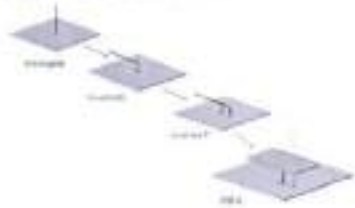

Fig 1:PIFA from monopole

This approach can have an effect on the impedance of the antenna terminals and it can be compensated with capacitive top loading and inductive loading. Equivalent circuit is replaced for the missing antenna height which improves the efficiency and impedance match. At the expense of fine matching and bandwidth, the resonance length can be reduced to less than λ/8 from λ/4 by the capacitive loading in the circuit. To produce a parallel plate capacitor, the capacitive load can be placed by an additional plate which is equivalent to the ground. The geometrical shape of PIFA antenna is shown below in Fig.1.

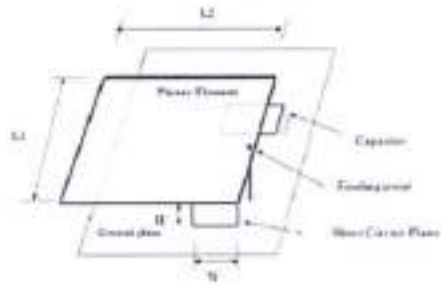

Fig 2: Equivalent circuit of PIFA

The approximate resonant frequency of PIFA is:

$$L1 + L2 = \lambda/4$$

When W/L1=1, $L1 + H = \lambda/4$

When W=0, $L1 + L2 + H = \lambda/4$

Where L1, L2 are the lengths of PIFA and W is width of PIFA .When the width W decreases, the resonant frequency also decreases. Usually the micro-strip antennas are half wavelength dimensions, where as the PIFA antenna is a quarter-wavelength dimension.Hence it is

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Design and Implementation of an IOT based Efficient and Intelligent Smart Bins by using Raspberry Pi

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ABSTRACT: Nowadays people are using smart phone to pay their electricity bills, buy vegetables, book transport ticket. Order accessories. But those are all done for an individual need. In this paper we used that smart for the welfare of the society. Overflowing garbage bins is a cause of concern for residents in developing countries. With the existence of many deceases in our nation, the open containers are proving to be a breeding place for germs. Traditionally municipalities operate on weekly routes to pick up wastes in the garbage bin on designated days but regardless of whether the containers re full or not. This paper aims to optimize waste collection and to maintain the cleanliness of the area. The aim of the paper is to control the waste management system by using internet. Internet of things (IOT) is the concept of basically connecting any device with an on and off switch to the internet. This project connects the trash can to the internet. It will update the status of the trash can to the user so that the garbage will be cleaned earlier to the overflow stage. This smart trash can has two ultrasonic sensors. Which are used to find the level of the garbage in the trash can. If the level reaches the threshold value then the Raspberry Pi model will send message to a mobile application as well as to an IOT cloud.

KEYWORDS: Raspberry Pi, IOT cloud, Smart bin.

I. INTRODUCTION

Waste management is all the activities and actions required to manage waste from its inception to its final disposal. This includes collection, transportation, treatment and disposal of waste together with monitoring and regulation. Waste collection methods vary widely among different countries and regions. Domestic waste collection services are often provided by local government authorities. Curbside collection is the most common method of disposal in most countries, in which waste is collected at regular intervals by specialized trucks. Waste collected is then transported to an appropriate disposal area. Nowadays, cities with developing economies experience exhausted waste collection services, inadequately managed and uncontrolled dumpsites and the problems are worsening. Waste collection method in such countries is an on-going challenge and many struggle due to weak institutions and rapid urbanization. By 2030, almost two-third of the world's population will be living in cities. This fact requires the development of sustainable solutions for urban life, managing waste is a key issue for the health. Efficient and energy-saving waste management, reducing CO2,air pollution and vehicle exhaust emissions—these are just a few examples for the demands of future cities. In views of that, the efficient use and responsible handling of resources become more important. Effectively managing waste is important in developed countries. Waste management may swallow up to 50% of a city's budget, but only serve a small part of the population. Sometimes, up to 60%of waste is not being collected; it is often simply burned by the roadside. It can pollute drinking water; it can spread disease to people living nearby. Even with great route optimization, the worker must still physically go to the dustbin to check waste levels. Because of this, trucks often visit containers that do not need emptying, which wastes both time and fuel. Waste management prevents harm to human health and the environment by reducing the volume and hazardous character of residential and industrial waste. Improving proper waste management will reduce pollution, recycle useful materials and create more green energy.

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Effect of chromium substitution on the structural and magnetic properties of cobalt ferrite

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ABSTRACT

Spinel structured ferrite materials have been explored more than the other types as bearing simplified structural analysis and also their synthesis methods. In this present report Cr^{3+} doped spinel structured cobalt ferrite nanopowder materials have been synthesized and characterized. For investigation of structural, morphological, and magnetic properties, analytic techniques such as powder X-ray diffraction, FT-IR, FESEM, and VSM have been employed. The phase analysis from XRD data showed the spinel structure with the lattice parameters with the range of 8.328–8.412 Å. The FESEM images show non uniform size and shape distribution of these different composition powder samples. The VSM measurement shows a decreasing saturation magnetization as the Cr^{3+} content increases. Whereas, the coercive force and remnant magnetization at first increase and then decrease with Cr^{3+} content.

1. Introduction

Ferrites have become increasingly important materials for electronics and biomedical engineering applications. They are also recently identified as potential electrode materials for lithium-ion batteries. The desirable structural, electrical, magnetic and dielectric properties made such a great focus materials and ample application of ferrites [1–4]. Among such a huge number of ferrite materials, cobalt ferrite has attracted lots of attention due to its large magnetocrystalline, high coercivity, moderate saturation magnetization, high electrical resistivity, high chemical stability and mechanical strength properties [5–7].

The synthesis methods significantly influence the physical properties of ferrite materials in general. Cobalt ferrite nanocrystalline material could be synthesized through the hydrothermal, co-precipitation, sol-gel, and so forth. The conventional ceramic method could also be used to synthesize materials which may be not in nanoscale level. The other important factors that determine the magnetic, electrical, structural, optical and dielectric properties are the chemical composition, the sintering temperature, the purity of chemicals, the synthesis method and all other synthesis parameters. The synthesis method affects the site occupation of the cations in the as-synthesized material which affect all the so mentioned properties of the material [8,9].

In this present report cobalt ferrite nanoparticles have been synthesized using the sol-gel auto composition method. In the effort, tuned properties of Cr^{3+} doping of cobalt ferrite materials have been explored.

2. Experimental techniques

2.1. Synthesis and characterizations

The Ferrite material, $Co_{1-x}Cr_xFe_2O_4$ which is spinel, is prepared by sol-gel method assisted by citric acid acting as the chelating agent. Cobalt nitrate hexahydrate, Cromium nitrate hexahydrate, Ferric Nitrate, and citric acid monohydrate are the raw elements which are taken in the stoichiometric amounts. These raw materials are mixed thoroughly and dissolved in deionized water. The mixing and dissolving is done in their molar ratio of 1:1. The solution is continuously stirred for one hour at 70 °C. This resulted in a homogeneous solution. This homogeneous solution is vaporized at 150 °C till a dry gel is formed. The ammonia solution is added to maintain the pH of the mixed homogeneous solution. The obtained gel is ground and calcinated for 3 h at 1000 °C to decompose the

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Research paper

Design of high speed Wallace tree multiplier using 8-2 and 4-2 adder compressors

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Abstract

Multiplication is one of the most common arithmetic operations employed in digital systems such as FIR filters and DSP processors but multipliers are the most time, area, and power consuming circuits. Improvement in any of these parameters can be advantageous for improv-ing the efficiency of the circuit. High-speed multiplier which uses the high-speed adder is designed based on the Wallace tree concept in this paper. In this paper first we present an approach towards the reduction of delay in Wallace tree multipliers by using 8:2 and 4:2 adder com-pressors, in the partial product reduction stage. The proposed design is also compared to the Wallace Tree multiplier which uses 4:2 and 8:2 adder compressors in terms of propagation delay. The proposed design enhances speed of the system by 74.1% compared to the conven-tional Wallace Tree multiplier, while 24.1 % reduction was achieved in the delay of the system relative to Wallace tree multiplier with 16-bit adder with one of the 8-2 adder compressors.

Keywords: *Wallace Tree Multiplier, Compressors and Adders.*

1. Introduction

Multiplications are important and tedious task among arithmetic operations. So, multipliers are the major components in the various processors like arithmetic, signal, and image processors. There are many multiplication based functions like multiply and accumulate, convolution, filtering etc. in signal processing and image processing. The execution time for this process highly depends on the speed of operation of multiplier unit. In many DSP algorithms multiplication consumes more time compared to other basic operations, so the critical delay path for the complete operation is determined by the delay required for the multiplication unit and it substantiates the performance of the algorithm. Addition and multiplication are widely used operations in computer arithmetic; for addition full-adder cells have been extensively analysed for approximate computing [6-8].

Now a day's available different types multiplication algorithms and each algorithm involves three basic steps such as partial product generation, partial product reduction and final summation. Some of the multiplication algorithms are serial multiplication, parallel multiplication and serial-parallel multiplication. Serial multiplication contains less hardware and less speed of operation [1]. Parallel multiplication is used in high-speed application and speed depends on number of partial products [2]. Now day's available different types parallel multiplier like array multiplier and tree multiplier [3]. Wallace tree multiplier is little bit fast among the available multipliers [4] and they use carry save algorithm for faster applications [5].

This paper is organized as follows. Section 2 [illegible] existing schemes for Wallace tree multiplier. The [illegible] of an approximate 4-2 and 8-2 adder compressor are presented in Section 3. Introduction to 4-bit and 8-bit multiplication algorithms are given in Section 4 and high speed adders in Section 5. Two proposed high speed multipliers i.e. 4-bit and 8-bit Wallace tree multipliers see in Section 6. Simulation results for multipliers with the approximate compressors are provided in Section 7. Section 8 concludes the manuscript.

2. Literature survey

The approximation of arithmetic design focus on adder, but multiplier is one of the primary source reduce the power consumption digital signal processing such as FIR filters [9]. The majority of approximate arithmetic design focused not only adder but also the multiplier. So, in this paper we can design the multiplier using approximate adders. There are some research directions for designing approximate circuits. Gupta et al. [10] made a reduction approximate multiplier at transistor level. For simplifying logic area Shin et al. [12] reduce the circuit area and more studies reduced the circuit delay by adjusting circuit architecture [11].Two well-known fast multipliers were presented by Dadda and Wallace and these multipliers use full adders and half adders in reduction phase. The modified Wallace tree reduces 80% of half adders. The partial products are also minimized. Finally, path carry select adder was used in final carry propagation [13].

Fast column compression multiplication has been acquired using combination of two different designs. One is dividing the partial products into two portions for independent parallel column compression and acceleration is achieved using hybrid adder. The performance of the column compressed multiplier was examined

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Research paper

Modified OFDM Receiver Design with Improved Channel Capacity

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Abstract

High data transmission rate, reliability and spectral efficiency are necessary for developing wireless communication systems for real time seamless audio and video transmission. To find the impact of wireless channel on OFDM signal, channel estimation plays a major role. In this paper, implementation of pilot assisted channel estimation and performance analysis of the CFO and STO are investigated and estimated. Distinctive channel estimation techniques like Least Square (LS), Minimum Mean Square Error estimator (MMSE) and proposed MMSE strategies are discussed and furthermore, this paper focuses on performance juxtaposition of the channel, CFO and STO estimation with reference to Symbol error rate and Mean square error. If the mean square error is higher for low SNR sub-channels, then allocate power by using water filling algorithm to increase the channel capacity of the users.

Keywords: OFDM, CFO, STO, LS, MMSE, Channel Capacity, Water-filling

1. Introduction

OFDM systems have become more and more fashionable in wireless broadcasting because of its high rate and quality transmission capability and its ability to inhibit multipath de- lay. Future wireless communications require more bandwidth and higher data rates. High bandwidth is often impossible because of spectral limitations. OFDM encounters requirement of evolving wireless channel capacity using accessible band- width and diminish inter-symbol interference. Fig. 1 shows the OFDM transceiver. OFDM is a multi-carrier multiplexing and employs digital modulation system that splits the complete channel into various parallel sub-channels, so that it eliminates inter symbol interference (ISI) and increases data rate.

The basic principle of OFDM is converts high rate serial bit stream into low rate parallel bit stream. Here channel will be considered as flat-tapped channel due to parallel bit streams. The sub- carriers in OFDM are overlapped and orthogonal to each other. These basic characteristics reduces the significant inter symbol interference (ISI) and increase the spectral efficiency of receiving OFDM signals. The sub-carriers are separated by guard band and not overlapped in FDM, which will decrease the spectral efficiency of signal. Orthogonality of carrier can be attained by selecting appropriate spacing of the carrier to be the reciprocal of the symbol time. A frequency wideband channel has converted into a group of narrow band channels in OFDM system. The applications of the proposed work are to solve channel capacity and data rate issues in advanced communication systems like cognitive radio communication systems, multiple-input multiple-output communication systems and green communication systems [1-2].

There are two categories of distortions accompanied by the carrier signal which are the carrier frequency offset (CFO) and symbol time offset (STO). OFDM system has more sensitivity to distortion. Environmental factors result in timing and carrier frequency errors which are more than a single carrier modulation system. A delay in the channel impulse response modelled as Symbol timing offset and difference in local oscillator frequencies in the transmitter and receiver modelled as carrier frequency offset which gives rise to shift in the frequency of receiving signals. Due to shrinkage in orthogonality among sub-carriers, the carrier frequency offset arises. Both STO and CFO represented phase rotation while exclusively STO represented as inter-symbol interference (ISI) and CFO as inter-channel interference (ICI) [2-3].

Equations (1) and (2) conveys the detected signal under the influence of CFO and STO where normalized CFO and STO denotes (ε) and ((δ)) respectively.

$$y_i[n] = \text{IDFT}\{Y_i[k]\} = \text{IDFT}\{H_i[k]X_i[k] + Z_i[k]\} \quad (1)$$

$$= \frac{1}{N}\sum_{k=0}^{N-1} H_i[k]X_i[k]e^{\frac{j2\pi(k+\varepsilon)(n+\delta)}{N}} + z_i[n] \quad (2)$$

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Out-of-Band Radiation, PAPR and SER Analysis for Future Wireless (5G) Communications

K. Anil Kumar and Kodali Satya Prasad

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Design and Implementation of High Speed Modified Russian Peasant Multiplier using 8-2 Adder Compressors

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Abstract – **FIR filters, microprocessor and digital signal processor are the core system of multipliers.MAC is the most important building block in DSP system. The key element of high throughput multiplier and accumulator unit (MAC) is to achieve a high-performance digital signal processing application, but multipliers are the most time, area, and power consuming circuits. In this paper, Modified Russian Peasant Multiplier (MRPM) using adder compressors has been proposed. According to Russian Rules, Divide and conquer technique is used in the multiplication process. But, in perspective of digital design, only shifters and adders are used in Russian Peasant Multiplier (RPM) to produce Partial Product Generation (PPG). In this paper first we present an approach towards the reduction of delay in RPM by using 8:2 adder compressors (8:2 AC), in the partial product reduction stage. The proposed design is also compared to the RPM which uses Ripple carry adder (RCA) and carry selector adder (CSA)in terms of propagation delay. The proposed design enhances speed of the system by 70.81% compared to the RPM using RCA and 92.11% compare to RPM using CSA. The total operation is coded with Verilog HDL using Model-Sim 6.3C, synthesized by using Xilinx ISE 14.7 design tool.**

Keywords: *MRPM, 8:2 AC, PPG*

I INTRODUCTION

Multiplications are important and tedious task among arithmetic operations. So, multipliers are the major components in the various processors like arithmetic, signal, and image processors. There are many multiplication based functions like multiply and accumulate, convolution, filtering etc. in signal processing and image processing. The execution time for this process highly depends on the speed of operation of multiplier unit. In many DSP algorithms multiplication consumes more time compared to other basic operations, so the critical delay path for the complete operation is determined by the delay required for the multiplication unit and it substantiates the performance of the algorithm. Addition and multiplication are widely used operations in computer arithmetic; for addition full-adder cells have been extensively analysed for approximate computing [1-3].

All DSP algorithms would need some form of the Multiplication and Accumulation Operation. It is consists of an adder, multiplier and the accumulator. Usually adders implemented in DSPs are RCA, CSA or CSA. Basically the multiplier will multiply the input values and give the results to the adder, which will add the multiplier results to the previously accumulated results. In this paper, MRPM using 8:2 has been designed. The reason for using the RPM is that, using this multiplier can reduce the number of partial products during multiplication. In final addition stage design an adder using 8:2 AC. This architecture is used to reduce the area, delay and power.

This paper is organized as follows. Section 2 is a review of existing schemes for RPM. The new designs of an approximate 8-2 AC are presented in Section 3. Introduction 8-bit RPM algorithms are given in Section 4 and high speed adder in Section 5. Proposed high speed MRPM see in Section 6. Simulation results for multipliers with the approximate compressors are provided in Section 7 and Section 8 concludes the manuscript.

2LITERATURE SURVEY

In [Chang.T.Y. and Hsiao, M.J., 1998] described the carry select adder using single ripple carry adder. a carry-select adder that requires a single carry-ripple adder with zero carry-in, an add- one circuit, and a multiplexer. Having a lower transistor count and 1.5 more units of twoinput NAND gate delay, the add-one circuit is used to replace the original carry-ripple adder with carry- in Cin = 1. The transistor count can be reduced by 29.2% with a speed penalty of 5.9% for n = 64.

In [Gunasekaran, K., and Manikandan, M. 2014], Reconfigurable FIR filter has been designed by using Russian Peasant Multiplier (RPM). For

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Comparative study of synthesis, structural and magnetic properties of Cu^{2+} substituted Co-Ni, Co-Zn and Co-Mg nano ferrites

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ABSTRACT

Mixed ferrites of the form $Co_{0.5}M_{0.1}Cu_{0.4}Fe_2O_4$ (M = Ni, Zn and Mg) have been synthesized using the sol-gel auto combustion technique. Structural analyses are carried out using powder X-ray diffraction to identify pure ferrite phases. SEM analysis revealed clear crystal morphology with relatively uniform grain sizes with polygonal structures. The FT-IR studies also confirm the bond formation and cation vibrations at low (365–392 cm^{-1}) and high (579–587 cm^{-1}) bands that correspond to the tetrahedral and octahedral sites, respectively. The magnetic properties studied through vibrating sample magnetometer showed that the Ni substituted sample has more magnetic character by exhibiting the highest saturation magnetization.

1. Introduction

Ferrites have immense technological importance especially in electronics. Such a huge importance of these materials is due to their unique electrical, dielectric, and magnetic properties. As a result, a wide range of applications including ferrofluids, magnetic drug delivery, microwave devices, information storage devices could be fabricated. Besides, the preparation of these ferrite materials is cost effective and simple [1–3]. The mixed ferrites have even more interesting properties and could be modified using different synthesis techniques. The wet chemical methods are more of simple and clean as compared to the conventional ceramic methods. The other synthesis routes include micro - emulsion, chemical co-precipitation, double sintering, etc., [4]. The polycrystalline ferrites exhibit very good dielectric properties and are applicable in the range of microwave to radio wave frequencies. Basically, the synthesis method and the sintering temperature will have an impact on the distribution of cations in the tetrahedral and octahedral sites which in turn affect the electrical and magnetic properties [5]. Beside the chemical compositions, the microstructures such as the grain size and porosity affect the electrical and magnetic properties as well. Lots of substituent elements have been tried to modify the structural, chemical, electrical and magnetic properties of ferrites [6–8].

In the present work, a comparative study of the effect of different cation substitutions in the $Co_{0.5}M_{0.1}Cu_{0.4}Fe_2O_4$ (M = Ni, Zn and Mg) materials have been reported. Each of these cations has its own impact on structural and physical properties. Obviously, since Ni is more magnetic material, it will enhance the magnetic properties of the material synthesized, whereas the other cations are nonmagnetic and so they can enhance the dielectric properties rather. But the individual ferrites, for instance Ni ferrite, do have quite different properties. For example, the Ni ferrite exhibits high electrical resistance and low coercivity [9].

2. Experimental

2.1. Materials

Preparation of $Co_{0.5}M_{0.1}Cu_{0.4}Fe_2O_4$ (M = Ni, Zn and Mg) ferrites has been done by the sol-gel method auto combustion method. The AR grade $Co(NO_3)_2.6H_2O$, $Ni(NO_3)_2.6H_2O$, $Zn(NO_3)_2.6H_2O$, $Mg(NO_3)_2.6H2O$, $Cu(NO_3)_2.3H_2O$, $Fe(NO_3)_3.9H_2O$, and citric acid are weighed in desired stoichiometric proportions and are dissolved in the minimum amount of distilled water. The individual solutions are then mixed together and the pH value is adjusted to 5–7 by adding NH_4OH solution. The solution is then burnt to self ignition to obtain a loose powder. The powders are annealed to 1000 °C in a muffle furnace for 3 h.

2.2. Characterizations

The powder X-ray diffraction (XRD) data of the samples has been collected on a Rigaku CuKα diffractometer with diffraction angles of

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Leaf Classification Using Completed Local Binary Pattern Of Textures

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***Abstract*—This paper, introduces utilizing the magnitude component of Local Binary Pattern (LBP) apart from sign component (which is considered as conventional method). We applied this Completed Local Binary Pattern (CLBP) on plant leaf classification by randomly taken divergent blocks of each texture data set. This approach is also useful for the identification of quality leaves for the automation of grading process in commercial crops like Tobacco etc. By combining Center pixel CLBP (CCLBP), Signed component of CLBP (SCLBP) and magnitude part of CLBP (MCLBP) there is a considerable development can be achieved for rotationally invariant texture classification.**

Keywords*—*Local Binary Pattern; Leaf Recognition; Rotation invariance; Image processing; Feature selection; Texture classification;

I. INTRODUCTION

Even though there is no formal definition of texture it plays a crucial role in image processing, and machine vision. There so many applications of texture particularly in the areas of face, gender, stone identification/classification and remote sensing. In field of medical image processing by the observation of images it is possible to identify and diagnose so many deceases like skin, breast cancer with speed and accuracy. By using similar methodology researchers try to simulate the same phenomena to recognize leaves and also classify high quality leafs for grading commercial crops like tobacco and other leaves [15]. By using computer vision /image processing we can simplify these types of tasks [10].So, it is an active and interesting research topic today.

The main geometric properties of the leaf that are useful for classification stated by Wu et al (2007) are diameter, physiological width, leaf area and leaf perimeters. According to Kadir et al and Wu et al. leaf features can be divided into two categories called general visual features and domain related visual features. General visual features defined as common features on images and no relation with specific type and content of images. Color, texture, shape features are come under this category. Domain related visual features combined with morphology properties of a leaf are shape, dent and vein. Local descriptors describe leaf details such as texture, correlation and homogeneity whereas global descriptors define a leaf shape in general, such as length, width and leaf area.

There are several no of classification algorithms and techniques based on textures proposed by researchers previously. They proposed many statistical and structural methods. The co-occurrence matrix methods [1] and filter based methods [2] to study rotation invariant texture classification. Kashyap and Khotanzad[3] used a circular autoregressive model. Varma and Zisserman[6] created a dictionary of texton from a training set ,and used for classification of images based on texon distribution. Later they used texon based image local patch to represent features directly and proposed another algorithm [7][8].Ojala[11] explained the usage of histogram property of Local Binary Pattern(LBP) for rotationally invariant classification of texture. Local Binary Pattern is simple but powerful operator to extract local image pattern [12].LBP used for many applications such as face recognition [13], dynamic texture recognition [14]. Ojala utilized the absolute Gray Level Difference property (AGLD) between pixel and its adjacent pixels. They also proposed Signed Gray Level Difference (SGLD)[16]. Even the LBP used successfully in fields of digital image processing and computer vision. But there is a lot of scope for investigation. Till now most of the researchers focused on signed component of LBP instead of magnitude component for their presentation of the local pattern. The algorithm CLBP proposed by Zhehua Guo and Lei Zhang [4] is major inspiration to our work. LBP may consider as a special case of CLBP by considering sign component (SCLBP) only. We can understand the importance of signed component of LBP (SCLBP) which gives additional local structural information about the image than magnitude component (MCLBP) of the image.

This paper attempts to effective utilization of the magnitude component of LBP and applied the approach in qualitative leaf classification.

The Structure of this paper organized as follows. In Section II explains about the methodology. Section III Presents CLBP implementation procedure. Section IV gives information about experimental back ground and datasets. Section V reports experimental results, comparison with other methods and section VI gives conclusions.

II. METHODOLOGY

A. ORIGIN OF LBP

First, Local Binary pattern (LBP) concept was invented by Ojala[13]and Pietkain in the year 1999 as a statistical approach. It evaluates a value that find the relative ness within

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RESEARCH ARTICLE OPEN ACCESS

An Overview on Image Retrieval Using Image Processing Techniques

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ABSTRACT
Data mining refers to the extracting of knowledge /information from a huge database. There are number of topics in data mining such as Clustering, Classification, Association, Decision Tree, Graph mining, Multimedia mining and Image Mining. In above topics Image mining plays a vital role in every aspect. Image mining is the process of searching and discovering valuable information and knowledge in large volumes of data. Image mining draws basic principles from concepts in databases, machine learning, statistics, pattern The demand of image mining increases as the need of image data is growing day by day. There are many techniques developed in the earlier researches and eventually these techniques can reveal useful information according to the human requirements, but Image Mining still require more development especially in the area of web images. Image mining contains different research areas like Space, remote sensing, medical diagnosis etc. These techniques include neural network, clustering, correlation and association. This writing gives a review on the application fields of data mining which is varied into telecommunication, manufacturing, fraud detection, and marketing and education sector. In this technique we use size, texture and dominant colour factors of an image. Gray Level Co-occurrence Matrix (GLCM) feature is used to determine the texture of an image.
Keywords :- Data Mining, Image Mining, Feature Extraction, Image Retrieval, Gray Level Co-occurrence Matrix (GLCM).

1. INTRODUCTION

1.1Preprocessing: In the image database, the spatial segmentation can be done at the region or edge level based on the requirements of the application. It can be done automatically or manually and it should be resemblance enough to retrieve the features that can reasonably capture the image content

Image Cleaning:

Image cleaning is the process of detecting and correcting (or removing) corrupt or inaccurate images from the set of images and refers to identify the unclear, incorrect, or irrelevant parts of the images and then replacing, modifying, or deleting the dusty or fouled image data.

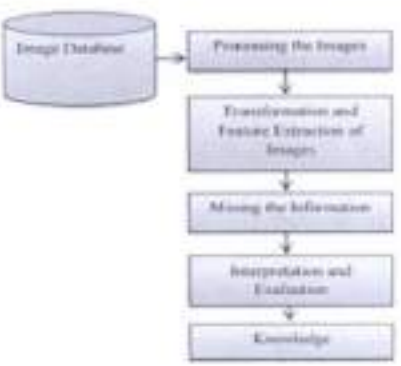

Fig 1: Image Mining Process

1.2Feature Selection and Extraction:

Feature selection and extraction a type of dimensionality reduction that efficiently represents the interesting parts of an image as a feature vector. This approach is useful when image sizes are large and a reduced feature representation is required to quickly complete tasks such as image matching and retrieval.

RESEARCH ARTICLE OPEN ACCESS

An Overview on Multimedia Data Mining and Its Relevance Today

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ABSTRACT
Over the past few decades, data quarrying or mining has been an effective approach for extracting concealed knowledge from huge collections of regulated digital data stored in databases. Multimedia data mining (MULTIMEDIA DATAMINING) refers to the analysis of large amounts of multimedia information in order to find patterns or statistical relationships. Rapid changes in information technology have drastically changed the functions and activities of multimedia. It includes audio, video, speech, text, web, image and combinations of several types are becoming increasingly available and are almost unstructured or semi structured data by nature, which makes it difficult for human beings to extract the information without powerful tools.. This paper sight sees survey of the current state of multimedia data mining and knowledge discovery, data mining efforts aimed at multimedia data, current approaches and well known techniques for mining multimedia data.

Keywords:- Data Mining, Multimedia Data Mining, Data Warehouse, Architectures, Applications, Models.

1. INTRODUCTION

With the recent progress in electronic imaging, video devices, storage, networking and computer power, the amount of multimedia has grown enormously, and data mining has become a popular way of discovering new knowledge from such a large data sets The goals of Multimedia Data Mining are to discover useful information from large disordered data and to obtain knowledge from the information. . Extracting the required information from the multimedia database is not a simple thing. The solution is to develop mining tools to operate on multimedia directly.

1.1 What is Multimedia Data Mining:

Multimedia mining is a subfield of data mining which is used to find interesting information of implicit knowledge from multimedia databases. Mining of multimedia data requires two or more data types such as text and video or text video and audio. Mining in multimedia is referred to automatic annotation or annotation mining

1.2categories Of Multimedia Data Mining:

Multimedia data are classified into five types; they are (i) text data, (ii) Image data (iii) audio data (iv) video data and (v) electronic and digital ink. Figure 1 illustrates multimedia data mining, in particular, various aspects of multimedia data mining

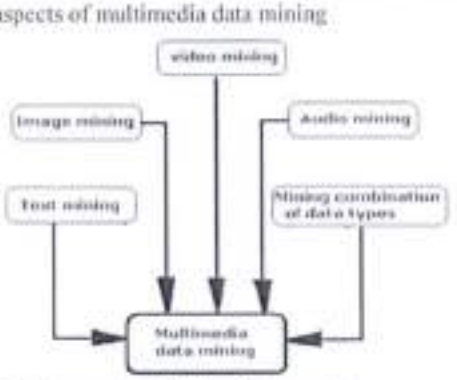

Fig 1: Categories of Multimedia data mining

Text mining

Text Mining also referred as text data mining and it is used to find meaningful information from the unstructured texts that are from various sources. Text is the foremost general medium for the proper exchange of information [3]. Text Mining is to evaluate huge amount of usual language text and it detects exact patterns to find useful information.

Image mining

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REDUCING SECURITY FEEBLENESS ISSUES IN CENTRALIZED SERVER DATA BY THE ATTACKERS USING SENSORS

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Abstract: **Data security and access control plays an efficacious role in protecting centralized server to restrict unauthorized/unauthenticated users in misusing the system. The security is imperious for outsourced classified data. This paper emphasizes the issues related to protecting centralized data from access by illegal users. The proposed a novel technique uses sensor approach to protect data whenever it is trapped. Use of sensor networks in restricted places provides utmost facility in handling the problem automatically without out the intervention of manual process. The proposed solution prevents data tampering as traffic analysis is done automatically using sensors in both inter and intra cluster communication.**

Keywords: Data tampering, attacks, clustering, hidden terminal problem

I. INTRODUCTION

The data hosted on the web is accessible to all the users if no security is provided. Suppose, if the data is confidential and only allowed users are required to access, then username and password are required or some key exchange process is to be done to allow authorized users to access data and restrict others not to access. This leads to major problem because attackers find several means to break passwords and tampering of data. In this paper, novel mechanisms are proposed to detect and trace the path of illegal access. The various issues related to trapping data are discussed the possible solutions are suggested based on the type attack occurred. The solution analysis includes traffic analysis, identifying type of attacks, how to handle localization issues, adopting cluster head mechanisms. Also rules for analyzing integrity violation are discussed.

II. RELATED WORK

The unauthorized data access by various attackers is analyzed using history information and statistics collected. The network attacks are detected using monitors[1,7]. The issues are part of intrusion detection system. In the host based intrusion detection systems, the process of detection is to be refined by introducing automatic detection system. The various possible chances of occurring attacks are to be predicted and need to be tracked for taking protecting sensitive data. Physical layer attacks, data link layer attacks and network layer attacks definitely do some harm to server databases. Apart from that attack against clock synchronization and symmetric key cryptography effects security factor of the server database. The minimization of self stabilization of network is done using clustering mechanisms [2].Self-stabilizing algorithms in sensor networks helps in detection of malicious nodes and later they will re organized using clustering algorithms. This approach targeted to put limit on unreliable communication. Cluster Gateway Switch Routing Protocol(CGSR) is used to cover maximum number of nodes in the cluster. Proactive routing protocols are discussed to update routing information from node to node time to time and Reactive protocols are used to update information when the route to the destination is required[3]. Optimal rank aggregation methods and Markov chain models[12]reduces the overhead of computation while doing meta-search operations. In distributed sensor networks data is collected by individual sensors and sent to central nodes for processing as the bandwidth of sensors is very much low[6,13].

In this paper, Section 1 describes previous work related to unauthorized data access by attackers and by other means. Section 2 illustrates schematic representation accessing centralized server data accessed by various devices. In Section 3, the various means of accessing data by authorized users is illustrated. And in Section 4, proposed solutions to Feebleness issues in Centralized Server Data using Sensors are discussed. The prototype of trapping central server data using OPNET modeler is elaborated in Section 5. In conclusion, the effective usage of sensor in automatic detection of attacks is emphasized.

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ELECTRONIC CUSTOMER RELATIONSHIP MANAGEMENT FOR CUSTOMER SATISFACTION IN ONLINE BANKING WITH SPECIAL REFERENCE TO ICICI BANK IN KAKINADA

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ABSTRACT:E-CRM was born around 1997 as a means of redefining the customer relationship through computer based tools. The main idea behind CRM was that with the help of latest technology, every customer interaction can be recorded which allows to provide the best customer service possible while creating a large data base of customer preferences that can be reviewed by sales, marketing and management personnel such customer data can then be used to reduce cost and to improve employee productivity. On line banking face to face interaction between bank and customer not seen. The present paper attempts to how bank use "electronic customer relationship management "'tool to maintain their customer relations by using the internet and what benefits are derived by using this E-CRM tool and how successfully this tool is implemented in a ICICI Bank Kakinada

KEYWORDS: Banks, ICICI Bank, e-CRM, customer relationship management

INTRODUCTION

The banking sector is facing enormous challenges of attracting the new customers and retaining the existing ones. The problems commonly encountered by the bankers are shifting of customer loyalty, difficulty in synchronizing demand and supply, controlling the performance quality of human interaction, etc. The attraction, retention, and building strong customer relationships through quality services are at the heart of the modern marketing. A sound marketing strategy is required to be adopted by the banker to build customer trust and retain them in the business and for competitive advantage across the industry. The strategy should focus on service quality rather than existing marketing mix, understanding of the customer expectations and perceptions and what they imply for the marketer, use of technology, planning for service recovery, customer-defined service standards, value pricing, etc. At this backdrop, the main objective of this paper is to analyze the data collected from the customers to understand their banking behavior; with particular emphasis on the following factors: a) Reasons for opening accounts with a bank, b) Expectation and perceptions of the customers regarding banking services. Customer Relationship Management (CRM) is a strategy mainly used to optimize customer loyalty and their lifetime experience. CRM can help companies succeed, where not only large multinational companies, but also many small companies are increasingly seeking to implement CRM in order to find a competitive advantage on which to base their business strategy. An e-CRM system aims to improve customer service, develop a relationship and retain valuable customers. E-CRM has been a major concern for many organizations especially the banking sector as it is thought to increase revenues and decrease costs while improving customer service. E-CRM can be operational, analytical, or collaborative. Operational e-CRM refers to customer touch points, such as telephones, fax, letters, e-mails etc. Analytical CRM refers to the continuous of collecting customers' data which requires technology. Collaborative CRM is a communication center that aims at building online communities, developing business-to-business customer exchanges, and personalizing services e-CRM provides various benefits to both employees and customers, some of which are integrating customer data into a single

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Simultaneous DG and Capacitor Placement for Energy Loss Minimization with Constant and Time Varying Load Profile

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Abstract: Energy conservation is gaining importance as it helps in bridging the ever increasing gap between generation and demand. Capacitor allocation is often considered as an option to minimize system losses but its impact is limited as it could inject only reactive power. With the recent restructured electricity markets, there is huge proliferation of distributed generation (DG) which drastically changed the loss minimization paradigm. In this context, the impact of DG along with capacitor placement need to be studied in detail as combined placement of these two could result in improved energy loss minimization. Conventional approaches for optimal placement of DG units and/or capacitor units are based on the assumption that network load profile is constant which is unrealistic. Hence optimal sizes and locations found assuming constant load profile would not lead to minimum annual energy loss under actual scenario where load duration curve is varying with time. The aim of this work is to consider the effect of time-varying load profile in determining the optimal DG and/or capacitor sizes and locations. Hence, a new approach based on time-varying load profile is proposed to solve DG and/or capacitor placement problem with an objective to minimize annual energy loss in the distribution system. The efficacy of the proposed approach is verified by carrying out simulations on IEEE 69-bus radial distribution system.

Keywords: Distributed generation, Capacitor placement, Time-varying load profile, Annual energy loss, Harmony Search Algorithm.

1. INTRODUCTION

Growth in energy generation is lagging behind the growing demand due to various reasons like industrial growth, rapid urbanization, increasing affordability of electric gadgets etc. Hence it is imperative to utilize the generated electrical energy efficiently to maximize economic benefits by conserving the energy. Power losses at distribution level are predominant in the system mainly due to low voltage and high currents and partly due to the overload conditions. In this context focus on energy conservation by employing loss reduction methods such as network reconfiguration, capacitor allocation and network reconductoring is increasing. Among these, usage of shunt capacitors along the feeders is very popular as it helps in reducing losses, improving voltage profile of the

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Multipath Transmission Optimized Shortest Acknowledge Based Neighbour Discovery

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ABSTRACT

In the era of the Information Technology world, w here Internet plays the important role in mentioning the whole world as the global village. In that aspect Communication medium is the back bone of the system. In the medium of the wireless sensors network where data flows form a source if hub through he routing protocol mechanism is the most important. In this paper, we try to put forward the concept of the Cryptographic key management for the managing the secure data transmission. Extending the support of the protocol where the encryption and decryption methodology plays to give the transmission. We have taken consideration of the access control based approach where data sharing would base on the group based specific and acknowledgment based approach to implement the best cryptographic approach. In order to secure the best of the privacy we have implemented the dynamic group based encryption and decryption mechanism the key fact behind this paper is try giving the extension to the classical mechanism where the optimization is not up to the mark of satisfaction. Here we consider the each and every node and its associated hub to attach to the parent node which we maintain the security sand optimization in the map reduced programming.

Keywords: Delay-Tolerant Routing; Packet Delivery Delay Distribution; Communication Cost Distribution, Wireless Networks, Ad Hoc Networks, Multipacket Reception, Network Management, Neighbor Discovery

I. INTRODUCTION

In a world where devices are becoming very powerful in terms of processing and storage, it is expected that human-carried devices may become part of DTNs, also known as Pocket-Switched Networks (PSN). In PSNs, forwarding may be done opportunistically based on the mobility behavior of humans. However, the efficiency of PSNs may deeply depend on the accuracy of mobility prediction. The current routing trend is to consider human behavior regarding social relationships where a social-aware approach to opportunistic routing in DTNs may present higher efficiency, since human relationships are less volatile than human mobility. In addition, this latest routing trend is also taking into account interest of users to help forwarding. Another aspect that can also be considered is the existing legacy infrastructure that can have an important role in routing information. The technology advancement of the network delay and pocket delivery where we put the concept of the classical technology. Typically, wireless sensor nodes are integrated with military command, control, communications, computing, intelligence, surveillance, reconnaissance and targeting systems. Examples of military wireless sensor network applications include battlefield surveillance, guidance systems for intelligent missiles, detection of attacks by weapons of mass destruction such as nuclear, biological, or chemical weapons and other monitoring applications.

Figure 1.1. Illustration of the WSN

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Multi-Hop Transport Protocol Communication Route Switching for Mobile Ad- Hoc Networks

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ABSTRACT

Time and the Constraint are both typically interrelated and lead us to the next level high technological revolution journey where we analyses the Human Automation instead of System Automation. Technological in the View Point cognitive science Information technology will have to make high level of demanding journey; in that aspect we consider the best of the technical revolution in the Social media where we share the thoughts , informational to many more . In Transport Protocol networks (CRNs), secondary users (SUs) can flexibly access primary users' (PUs') idle spectrum bands, but such spectrum opportunities are dynamic due to PUs' uncertain activity patterns. In a multi hop CRN consisting of SUs as relays; such spectrum dynamics will further cause the invalidity of predetermined routes. In this paper, we investigate spectrum-mobility-incurred route-switching problems in both spatial and frequency domains for CRNs, where spatial switching determines which relays and links should be reselected and frequency switching decides which channels ought to be reassigned to the spatial routes. The proposed route-switching scheme not only avoids conflicts with PUs but also mitigates spectrum congestion.

Keywords : Routing, Spectrum Dynamics, Transport Protocol, Transport Protocol, Mobile Ad Hoc Network, Multi-Hop Communication

I. INTRODUCTION

In the Era of Smart Phone, where we implement the best to best innovative service in the trend of entertainment which PC or Laptop is providing. Keeping those points in the Modernization and innovation to smart phone we implement the best to best of the Introductory Part. Accidentally smart Mobile is an existing Mobile that is unable to accommodate and integrate the new technologies. It is a phenomenon in which technological components are embedded gradually in the environment rather than the new smart Mobiles that are purpose-built to support technologies. For example if a person brings Bluetooth-enabled speakers to Mobile and set those to the nearest sound source may get different programmers that are originally set by a neighbor. Due to their low costs, ease of deployment, increased coverage, and enhanced capacity (e.g., via spatial reuse), multi-hop wireless networks such as mesh networks that utilize inexpensive and readily available 802.11 wireless interfaces are touted as the new frontier of wireless networking. Multiple orthogonal channels are defined in IEEE standards, e.g., there are 3 orthogonal channels for 802.11b and 13 for 802.11a.

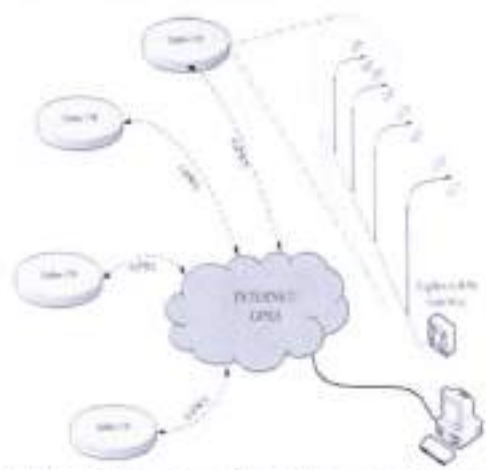

Fig.1.1 Illustration of Data Sharing Over the Protocol

These orthogonal channels provide the feasibility for interference mitigation among nearby wireless access networks. There can social consequences that can arise

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Efficient Parallel key management for Distributed Data Security in Content Delivery Networks

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ABSTRACT

Technology and its significant has changed the way of the time being lead to next level of journey to make classical technology to the ultra modern technology. Time being is called as the data to be secured with the node based cloud cluster mechanism. In this paper, we have the glimpse of the technology and its Significance may be loop based hole to imagine world, but in the terms of Reality really it's a wonder, where we think ability the more and more to explore things may be technology to give a seam less service the mankind. If we consider the networking where we made this ethereal world to a global village making things better, but there is no end of better. If we consider the parallel distributed network, where these days we face the difficulty in transferring the data, in turn we callas load balancing along with some other factors may also come. Hence, in this paper we try to give the glimpse of the best mechanism which involves the load balancing in Content Delivery Networks in the discrete acknowledge based dynamic method. We have taken consideration of the access control based approach where data sharing would base on the group based specific and acknowledgment based approach to implement the best cryptographic approach. In order to secure the best of the privacy we have implemented the dynamic group based encryption and decryption mechanism to some authorized group based on the clustered node where attribute based acknowledgement in the private share delivery networks.

Keywords : Access control, attribute-based encryption ABE, disruption-tolerant network (DTN), multi-authority, secure data retrieval.

I. INTRODUCTION

A novel class of wireless networks introduced as Vehicular Ad hoc Networks is presented in this research. In the network of topologies of moving vehicles used in similar and different radio interface technologies and equipped with wireless interfaces that use short-range to medium-range communication systems. One of the classes of the mobile ad hoc networks is a that facilitates communication between vehicles by using close stable equipment on a roadside when vehicles are surrounded by other vehicles. In the field of Vehicular Ad hoc Networks, new developments are strongly encouraged for industries that involve automotive and wireless technology. Firstly, we give an overview of the protocol, discussing the key points of its design. Secondly, analyze the prediction theory and algorithms at the basis of this. Thirdly, we discuss its implementation, focusing on the management of routing information for synchronous and asynchronous delivery. Finally, we present the design and implementation of a component for evaluating the predictability of the time series used to describe and Measure aspects of the mobile context. Firstly, we give an overview of the protocol, discussing the key points of its design. Secondly, we analyze the prediction theory and algorithms at the basis of this. Thirdly, we discuss its implementation, focusing on the management of routing information for synchronous and asynchronous delivery.

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Smart Mobile TV in the Technological Phones Integrating with cloud Based Service Social Media Service

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ABSTRACT

Technology and its way we implement has its own way to implement, if We Consider Today's world where the Smart market having the features smart mobile devices or tablets or recent terminology we can call it as Phablets, with smart features like which we want to put forward the Mobile TV, with a small difference of implementing the technology with the virtualization concept which we call it as cloud computing. In this paper, it describes about the way to filter data in the abundance of firewall and how to filter data, we represent the framework based innovative policy to adopt the management of configuring data and factors which bypass the mechanism. This framework based tool describes alternate to articulate the grid and cloud based computing based mechanism to handle the unwanted complex data. The most important issue to deal within the smart Mobile environment is to achieve a higher degree of integration and interaction between the devices. For this purpose our platform suggests connecting devices through TCP/IP protocols within the environment that enables better communication. This platform design considers security issues such as network security and user's personal contents security.

Keywords: Social V, Cloud Service, Phablets, Media Cloud

I. INTRODUCTION

In the Era of Smart Phone, where we implement the best to best innovative service in the trend of entertainment which PC or Laptop is providing. Keeping those points in the Modernization and innovation to smart phone we implement the best to best of the Introductory Part. Accidentally smart Mobile is an existing Mobile that is unable to accommodate and integrate the new technologies. It is a phenomenon in which technological components are embedded gradually in the environment rather than the new smart Mobiles that are purpose-built to support technologies. For example if a person brings Bluetooth-enabled speakers to Mobile and set those to the nearest sound source may get different programmers that are originally set by a neighbor.

There can social consequences that can arise with the technologies are implemented into the smart Mobile environment. The challenge of the designer is to deal with these social issues in efficient manner. The main social aspects to be considered are privacy, labor saving and good parenting. Cassavoy in his article defines a smart phone as "a device that lets you make telephone calls, but also adds features that you might find on a personal digital assistant or a computer".

Figure 1.1. The Existing Network Infrastructure to overcome in Cloud Media

A smart phone can send and receive voice calls and text messages as traditional cellular phones, but in addition these phones include digital camera and large storage capacity, they are programmable and able to connect to the internet. Apart from this, there are many applications

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Stabilization of Expansive Clay Using RHA and TSP

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Abstract: ***Expansive soils are biggest concern for geotechnical engineers as they are highly susceptible to swelling be of the presence of montmorillonite mineral. Among all the clay minerals like kaolinite, illite, montmorillonite and k onite, montmorillonite has the highest swelling property which leads to unpredictable swelling and shrinkage in expansiv oils. Several waste products are produced during the manufacturing and treating process in industries. Rice Husk Ash and ndur Stone Slurry Powder are such waste products and disposing of these minerals is concern for the environment, so usage hese products to stabilize soil will improve not only the soil strength but also environmental friendly. In the present study, ex ive clay is treated with RHA and the optimum mix is found out and it is further stabilized with Tandur Stone Slurry Po to increase the CBR value of the soil.***

Keywords: ***Expansive soil, Rice husk ash (RHA), Tandur Stone Slurry Powder (TSP), Soaked CBR***

I. INTRODUCTION

Expansive soil is one among the problematic soils that has a high potential for shrinking or swelling due to change of i ture content. Expansive soils can be found on almost all the continents on the Earth. World over, problem of expansive s has appeared as cracking and break-up of pavements, railway and highway embankments, roadways, building foundations, ir ation systems, water lines, sewer lines, canal and reservoir linings. The losses due to extensive damage to highways runni over expansive soil sub-grades are estimated to be in billions of dollars all over the world. Various remedial measures l soil replacement, moisture control, pre-wetting, lime stabilization have been practiced with varying degrees of success. Howev hese techniques suffer from certain limitations with respect to their adaptability, like longer time periods required for pre-wet the highly plastic clays, difficulty in constructing the barriers, pulverization and mixing problems in case of lime stabilization igh cost for hauling suitable refill material for soil replacement etc.

A. Material Used for Present Study

1) Expansive Soil: The soil used was a typical black cotton soil collected from KAKINADA, in East Godavari District, dhra Pradesh State, India. The properties of soil are presented. All the tests carried on the soil are as per IS specification.

2) Rice Husk Ash(RHA): Rice milling generates a by-product know as husk shown in figure1. This surrounds the paddy ain. During milling of paddy about78% of weight is received as rice, broken rice and bran. Rest 22% of the weight of paddy is ved as husk. This husk is used as fuel in the rice mills to generate steam for the parboiling process. This husk contains about 75% anic volatile matter and the balance 25% of the weight of this husk is converted into ash during the firing process, is known as Ri husk Ash (RHA). This RHA in turn contains around 85% - 90% amorphous silica. So for every 1000 kg of paddy milled, about kg (22%) of husk is produced, and when this husk is burnt in the boilers, about 55 kg (25%) of RHA is generated. India is a m rice producing country, and the husk generated during milling is mostly used as a fuel in the boilers for processing paddy, pr cing energy through direct combustion and/ or by gasification.

Fig1. Rice Husk Ash

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An Efficient Leaf (Texture) Classification using Local Binary Pattern with Noise Correction

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Abstract: Leaf classification by using images based on their textures is the main objective of this study. Local Binary Pattern (LBP) operator is eminent extracting method but it is not effective especially in the cases where noise (noise occurs due to external sources and other reasons) in the images involved or corrupted the image patterns. Local Ternary Pattern (LTP) is another famous feature extracting method gives solution to some extent but not completely solves this problem. Towards achieving perfectness of classification by correcting noisy bits, we propose a method for both error detection and correction called Corrected LBP (CLBP) based on the analysis of uniform binary patterns which are appears more frequently in the natural images and almost all image structures. We suggested in our proposed method modification of bits in the pattern based on the analysis of neighbouring bits. It gives significant increase of accuracy and performance levels.

Key words: Texture, noise, local binary patterns, uniform patterns, local ternary patterns, LBP

INTRODUCTION

An image worth thousand words of information. Now a days by the help of digital image processing we can study and apply various methods to extract the hidden information from the images and analyse them to get useful results for various types of applications. In the recent years, after invention of modern digital and web cameras and cell phones there is rapid development in the aspects of speed and accuracy in the area of digital image processing.

The word "texture" plays critical role in the field of image processing and machine vision. Even though there is no exact definition for the term texture accepted it is gaining popularity from several decades. Classification is the process of segregating things in to various well known categories according to certain criteria. There are several methodologies developed on texture classification still there is a scope to extend or modify them. Still for many researchers it is one of the challenging and interesting topic.

The texture classification has wide variety of applications in diverged areas. Here, we are mentioning some of them. For stone classification we can recognize various types of stones and their quality especially where human inspection or observation is difficult or impossible (at underground, mines, etc.). We can apply texture classification methods not only for face recognition we can also classify them into various age groups or gender classification. By using textures in the field of remote sensing classify the places in certain area as hills, grounds, fields and rivers, etc. In medical image processing we can recognize the tissues of the skin based on their texture which are effected by skin deceases and to identify breast cancer by using image textures (these pictures are called mammograms). In timber industry by wood classification we can identify the strong and quality wood. In textile industry there is quality checking of fabrics based on the inspection of their properties like texture, colour and thickness. The application areas are not only limited to above but also content-based feature extraction from image and video databases, motion and activity analysis and biometrics.

Leaf is one of the important part of the plant or a tree for classification criteria because it always available irrespective of seasons and time. Whereas, some flowers and fruits of the trees are not available for a particular time or season. So, classification of plants and trees based on their leaves gives more effectiveness than other parts of the tree. Leaf classification is to identify and separate the leaves based on their appearance and structure and colour. Leaf classification in scientific methods is a

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Robust and indiscernible multimedia watermarking using light weight mutational methodology

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ABSTRACT. *In recent years, with the growing use of the internet and wireless networks, the exchange and access to multimedia data through the insecure web is also growing as a part of telemedicine. Using the concept of multimedia watermarking, the proposed system aims at providing authentication, confidentiality, and integrity to the patient medical record. A new robust and imperceptible watermarking approach is proposed which is based on a mutational encryption, lifting wavelet transform and singular value decomposition for authenticating medical images. To provide authentication and confidentiality, patient data is encrypted with mutation algorithm and embedded in a patient fingerprint image using Penultimate Least Significant Bit (PLSB). Then the fingerprint image is watermarked into a medical image using an LL band of the cover image and the HH band of watermark image obtained by second level LWT and SVD. The proposed approach performance is assessed by different image quality metrics. The watermarked image quality and extracted watermark image quality are analyzed at different scaling factors with the help of Normalized correlation and Peak signal to noise ratio. Investigation results exhibit that the proposed approach can withstand different image processing attacks like a Median filter, JPEG compression, Gaussian, Salt, and pepper Noise. So the proposed work can be used to transmit a patient's multimedia medical data by providing high security and privacy.*

RÉSUMÉ. *Ces dernières années, avec l'utilisation croissante d'Internet et des réseaux sans fil, l'échange et l'accès aux données multimédia via le Web non sécurisé se développent également dans le cadre de la télémédecine.En utilisant le concept de filigrane multimédia, le système proposé vise à fournir une authentification, une confidentialité et une intégrité au dossier médical du patient.Une nouvelle approche de filigrane robuste et imperceptible est proposée, basée sur un cryptage mutationnel, une transformation en ondelettesde levage et une décomposition en valeurs singulières pour l'authentification des images médicales.Pour assurer l'authentification et la confidentialité, les données du patient sont cryptées avec l'algorithme de mutation et incorporées dans une image d'empreinte digitale du patient à l'aide du Penultimate Least Significant Bit (PLSB). L'image de l'empreinte digitale est ensuite filigranée dans une image médicale en utilisant une bande LL de l'image de couverture et le*

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Crop Coverage data Classification using Support Vector Machine

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Dayananda Sagar College of Engineering

Abstract- A statistical tool which can be used in various applications ranging from medical science to agricultural science is support vector machines. The proposed methodology used is support vector machine and it isused to classify a raster map. The dataset used herein is of Gujarat state agriculture map. The proposed approach is used to classify raster map into groups based on crop coverage of various crops. One group represents rice crop coverageand the othermillets crop coverage and yet another that of cotton crop coverage.Various statistical parameters are used to measure the efficacy of the proposed methodology employed.

Keywords: mining. SVM, supervised classification.

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Volume 5, Issue 6, June 2016

Design and analysis of ICE bar shaped patch antenna parameters using HFSS

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Abstract-- **A Microstrip antenna with an ice cream bar shaped patch is designed at a frequency of 2.4GHz. This antenna is designed using an FR4 epoxy substrate material (ε_r = 4.4) is simulated for different slot positions on the substrate using HFSS software and achieved a return loss of 30.7 dB. These antennas will find vast applications in Wireless LAN's and WiFi.**

Index Terms-**Microstrip patch antenna, HFSS software, WLAN**

I. INTRODUCTION

A Microstrip patch antenna is a narrowband, wide-beam antenna fabricated by etching the antenna element pattern in metal trace bonded to an insulating dielectric substrate, such as a printed circuit board, with a continuous metal layer bonded to the opposite side of the substrate which forms a ground plane. Low dielectric constant substrates are generally preferred for maximum radiation. The conducting patch can take any shape but rectangular and circular configurations are the most commonly used configurations. Other configurations are complex to analyze and require heavy numerical computations. A Microstrip antenna is characterized by its Length, Width, Input impedance, polarization, and Gain and radiation patterns.

Microstrip patch antennas are increasing in popularity for use in wireless applications due to their low profile structure. Therefore they are extremely compatible for embedded antennas in handheld wireless devices such as cellular phones. The telemetry and communication antennas on missiles need to be thin and conformal and are often in the form of Microstrip patch antennas. Another area where they have been used successfully is in Satellite communication. Some of the major advantages are

- Light weight and low volume.
- Low profile planar configuration which can be easily made coaformal to host surface.
- Low fabrication cost.
- Supports both linear as well as circular polarization.
- Mechanically robust.

II. GEOMETRY:

The geometry is based on the calculations of width, height and thickness etc. by mathematical analysis.

- **Patch dimensions**

$$W = \frac{c}{2f\sqrt{\varepsilon_{eff}}} \quad \text{---------- (1)}$$

$$L = \frac{c}{2f\sqrt{\varepsilon_{eff}}} - 2\Delta \quad \text{---------- (2)}$$

$$\varepsilon_{eff} = \frac{\varepsilon_r + 1}{2} + \frac{\varepsilon_r - 1}{2}\left(1 - \frac{10H}{W}\right)^{-\frac{3}{2}} \quad \text{---------- (3)}$$

$$\frac{\Delta}{H} = 0.412\frac{\varepsilon_{eff} + 0.3}{\varepsilon_{eff} - 0.258}X\frac{\frac{W}{H} + 0.262}{\frac{W}{H} + 0.813} \quad \text{---------- (4)}$$

- **Ground Dimensions**

$$W_g = 6H + W \quad \text{---------- (5)}$$

19-20

STUDY OF FACTORS AFFECTING INVESTMENT DECISIONS OF INVESTORS WITH SPECIAL REFERENCE TO EQUITY MARKET IN SELECTED AREAS OF KAKINADA DISTRICT (A.P) (Pages 55-64) by Mr. N. S. V. N. Raju* and Dr. Anita Patra** in THE INTERNATIONAL MANAGER / ISSN: 2348-9413 (Online); 2348-9405 (Print)

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Original Article

STRUCTURAL MORPHOLOGY AND THERMAL PROPERTIES OF POLYPROPYLENE/BARIUM CARBONATE NANOCOMPOSITES

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ABSTRACT

Incorporation of nanoparticle metallic carbonates in thermoplastic polymers like polypropylene has been done for decades to make the composites having remarkable and enhanced properties. An attempt has been made in this way, in order to enhance thermal properties of the composite materials. Structural morphology and thermal properties of high density polypropylene reinforced with Barium carbonate nano particles with filler loadings of 1%, 3%, 5% & 10% wt. of polypropylene (PP) nano composites have been studied. A good dispersion of nano particles is found in SEM micrographs for the composite PP+5% $BaCo_3$. Results of DSC thermal studies have revealed a considerable improvement in the percentage of cry stallinity and a good thermal stability at the $BaCo_3$ filler loading of 5% wt. of PP when compared to other nano composites.

KEYWORDS: Nano Composites, Barium Carbonate Nano Particles, Polypropylene & Thermal Properties

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INTRODUCTION

There has been a quest for decades in designing light weight and high strength materials. When compared to traditional materials, polymer nanocomposites exhibit changes in some properties at very low filler loadings like carbon nanotubes [1, 2] and graphite nanoplatelets [3-6]. The desired properties can be achieved only when there is a homogeneous dispersion of nano fillers in the polymer matrix and good adhesion between nano fillers and host polymer matrix [7]. In fact the desired properties of the composites filled micron-sized filler particles are not adequate to those filled with micro particles of same filler [8, 9]; also physical, mechanical and thermal properties cannot be achieved by using conventional micron-sized particles.

Due to the significant improvement in mechanical properties, thermal stability and electrical properties over the conventional thermoplastic polymers, polymer nanocomposites have been attracting the attention for few decades [10]. The effect of filler nanoparticles on these properties have been studied extensively [11]. Stress concentration, de-bonding of polymer/ filler interface and formation of shear bonds is the key mechanism of toughening the thermoplastic polymers incorporated with inorganic fillers. The inorganic filler acts as stress concentrator in the polymer matrix during the deformation because of the difference between elastic behaviors of the phases, i.e. each phase has a different elastic modulus [13]. Based on which, layered silicates, such as montmorillonite, has been used [14-17]. Nanocomposites prepared using montmorillonite showed improved strength, modulus and heat distortion temperature properties. Even though attractive improvements in physical and mechanical properties of the polymer/ clay nanocomposites have been noted, a significant drawback of low fracture toughness became a hindrance for engineering applications. In many cases, a considerable decrease in

AN HYBRID APPROACH FOR SINGLE CHANNEL SPEECH ENHANCEMENT USING SOFT-DECISION BASED SPEECH PRESENCE PROBABILITY ESTIMATION

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ABSTRACT

In real-world speech signals get contaminated due to various sort of noises or channels which degrades the communication quality and adversely impacts speech recognition performance. To overcome these issues, we developed a novel approach for speech enhancement where Wiener filtering and power spectrum computation is applied for degraded signal. In next phase, MMSE technique is applied where Gaussian distribution of each signal i.e. original and noisy signal is analyzed. The Gaussian distribution provides spectrum estimation and spectral coefficient parameters which can be used for probabilistic model formulation. Moreover, *a priori* SNR computation is also incorporated for coeeficient updation and noise presence estimation which operates similar to the convetional VAD. However, convetional VAD scheme is based on the hard thresholding which is not capable to derive satisfactory performance hence here we developed a soft-decision thresholding based approach for improving the performance of speech enhancement. An extensive simulation study is carried out using MATLAB simulation tool on NOIZEUS speech database and a comparative study is presented where propsoed approach is proved better in comparision with existing techniques.

Key words: a priori SNR, Speech Presence Probability Estimation, Gaussian distribution, PSD, noise tracking.

INTRODUCTION

Now-a-days, demand of communication systems is growing rapidly such as video communication, audio communication systems etc. In various communication systems such as video/multi-media communication and audio based communication systems, speech communication plays an important role which has impact on the efficient communication [1].