

# **International Conference on Electrical, Electronics & Computer Communication Engineering**

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**Organized By**

**Department of Electronics and Communication Engineering**

**Koneru Lakshmaiah Education Foundation, AP -522502**

Good morning, all! "Thank You" is a prayer that cannot be seen or touched. It must be felt by the heart. I feel honored and privileged to get the opportunity to propose a vote of thanks on this special occasion.

I thank all the honorable delegates who blessed us with their presence. I am also very thankful to all Program Advisory Committee members and the invited speakers. Words are not enough to thank their constant guidance and support in shaping **International Conference on Electrical, Electronics & Computer Communication Engineering**.

I am very thankful for our current and former faculty colleagues and non-teaching staff members who always stand by and motivate us. I feel proud, and thank you for making this event successful.

**President KLEF**

**Er.Koneru Satyanarayana**

It has been our pleasure to host all the participants **of International Conference on Electrical, Electronics & Computer Communication Engineering** at K L E F. The participants were very enthusiastic.

I am thankful to all the participants for coming to KL University to attend the conference. We have been fortunate to have some eminent persons from academia, industry, and utility working in Current Research Areas. I am sure that the participants must have benefitted by attending this conference. I am very much thankful to all the sponsors of this conference. Without their generous financial support, organizing this conference would not have been possible.

**Vice-Chancellor**

**Dr.G.Pardha Saradhi Varma**

A splendid evening finally comes to an end. On behalf of K L E F, I feel honored to thank all the dignitaries who have taken valuable time to make the **International Conference on Electrical, Electronics & Computer Communication Engineering** a grand success.

I am thankful to the steering committee members for giving us the opportunity.

I take this opportunity to thank all the reviewers and technical committee members for providing their valuable comments in time and helping improve the quality of the papers presented at the conference.

My Best Wishes to the Technical Committee, Publication Chair, HoD, research scholars and faculty, and staff members. I am also thankful to all who have helped us organize the conference.

**Registrar(I/C)**

**Dr.A. Jagadeesh**

## Contents

<b>S.No</b>	<b>Title of the Article with Author Names</b>	<b>Page No.s</b>
1	Image Captioning Using Deep Learning Bhavana D.;Chaitanya Krishna K.;Tejaswini K.;Venkata Vikas N.; Sahithya A.N.V.	1
2	A Hybrid Method to Reduce PAPR of OFDM To Support 5g Technology Bhavana D.;Neelothpala, Adada;Kalpana, Pamidimukkala	2
3	Improved Design Debugging Architecture Using Low Power Serial Communication Protocols for Signal Processing Applications Murali A.Kakarla, Hari Kishore Anitha Priyadarshini G.M	3
4	Estimation of Intrapulse Modulation Parameters Of Lpi Radar Under Noisy Conditions Raja Kumari, Chilukuri, Kakarla, Hari Kishore Subbarao K.	4
5	Investigations On Graphene-Based Ultra-Wideband (Uwb) Microstrip Patch Antennas For Terahertz (Thz) Applications Shamim S.M.;Das, Sudipta, Hossain, Md. Arafat ,Madhav, Boddapati Taraka Phani	5
6	Analysis, Design and Fabrication of A Square Slot Loaded (Ssl) Millimetre-Wave Patch Antenna Array for 5g Applications Aghoutane, Bilal ; Das, Sudipta; El Faylali, Hanan;Madhav B.T.P.;El Ghzaoui, Mohammed; El Alami, Ali	6
7	Structural, Optical, and Magnetic Properties of CD Doped Zno Nanomaterials for Optoelectronic Device Application Koutavarapu, Ravindranadh ;Manepalli R.K.N.R.;Madhav B.T.P.;Rao M.C.him, Jaesool	7
8	Indoor and Outdoor Localization Methods For Advanced Navigation Systems Kanakaraja P, Kotamraju. Sarat K. Nadipalli, L. S. P. Sairam, Kumer, S. V. Aswin;Sri Kavya, K. Ch.	8
9	Localization Algorithms And Approaches For Navigation In Advanced IOT Applications Kanakaraja P.;Kotamraju, Sarat K.;Nadipalli, L. S. P. Sairam;Kumer, S. V. Aswin.;Sri Kavya, K. Ch.	9

10	The Categorization of Artificial Intelligence (Ai) Based On The Autonomous Vehicles and Its Other Applications Aswin Kumar S.V Kanak raja P Sairam Nadipalli L.S. Ramesh N.V Kotamraju, Sarat K.	10
11	Face Mask Detection Using LABVIEW Santhosh, Chella, Kumar, M. Ravi;Prasanna, J Lakshmi;Kumar, I. Ram;Kumar, U. Vinay;Sri, S. Navya	11
12	Augmentation and Detection of Individual Pose Using Cuda Muzammil Parvez M.; Inthiyaz, Syed; Praghash K.; Suresh Kumar K.; Sreevardhan. Cheerla	12
13	Design and Analysis of A UWB Patch Antenna For Wireless Implantable Body Area Network (Wi Ban) Applications Pokkunuri, Pardhasaradhi Madhav, B T P, Udaykiran, Kasi, Gandu, Srilekha	13
14	Implementation of Hybrid Deep Learning Model (Lstm-Cnn) For Ionospheric Tec Forecasting Using GPS Data Adarsha Ruwali; A. J. Sravan Kumar; Kolla Bhanu Prakash; G. Sivavaraprasad; D. Venkata Ratnam	14
15	Subsurface Analysis Using Machine Learning Muzammil Parvez M. <sup>1,2,a)</sup> , J. Shanmugam <sup>1,b)</sup> , V. S. Ghali <sup>2,c)</sup> , Syed Inthiyaz <sup>2,d)</sup> , Poorna Prasanth Sai Lingamallu <sup>2,e)</sup> , and Shirisha Reddy Jaggannagari <sup>2,f)</sup>	15
16	Peak To Average Power Ratio Reduction Of Zt Dft-S-Ofdm Signals Using Hybrid Improved Monarch Butterfly Optimization-Pts Scheme With Tr-Clipping Scheme Pathuri Lavanya, Penke Satyanarayana, Mohammad Mohatram	16
17	Heat Wave Characteristics Over India During Enso Events N Naveena <sup>1</sup> , G Ch Satyanarayana <sup>1</sup> , K Koteswara Rao <sup>2</sup> , N Umakanth <sup>1</sup> & D Srinivas <sup>3</sup>	17
18	A Triple Band-Notched Uwb Antenna For Microwave Imaging Applications D. Sreenivasa Rao; I. Govardhani	18
19	An Effective Brain Tumour Detection from T1w MR Images Using Active Contour Segmentation Techniques KRajesh Babu, KSony, NDurga Indira, K Vara Prasad and Syed Shameem	19

20	Simulation and Analysis Of Smart Home Architecture P. Saleem Akram <sup>1</sup> , Ramesha M <sup>2</sup> and T. V. Ramana <sup>3</sup>	20
21	An Iot Enabled Air Quality Monitoring System Using Lora and Lpwan E Raghuvеera; P Kanakaraja; K Hari Kishore; C Tanvi Sriya; Durga Prasad B; B Sai Krishna Teja Lalith	21
22	Augmentation and Detection of Individual Pose Using Cuda M Muzammil Parvez <sup>1</sup> , Syed Inthiyaz <sup>1</sup> , K Praghash <sup>1</sup> , K Suresh Kumar <sup>1</sup> and cheerla Sreevardhan <sup>1</sup>	22
23	Early Estimation Model For 3d-Discrete Indian Sign Language Recognition Using Graph Matching Kiran Kumar E.; Kishore P.V.V.; Anil Kumar D.; Teja Kiran Kumar M.	23
24	Smart Control System For Smart City Using IOT Avinash, Parasa; Vamsi, B Krishna; Srilakshmi, Thumu; Kishore P.V.V.	24
25	Yolo V2 With Bifold Skip: A Deep Learning Model For Video Based Real Time Train Bogie Part Identification And Defect Detection Mohan, K. Krishna; Prasad, Ch. Raghava; Kishore P.V.V.;	25
26	Medical Image Measurement and Characterization: Extracting Mechanical and Thermal Stresses For Surgery Lay-Ekuakille, Aimé <sup>a</sup> ; Ugwiri, Moise Avoci <sup>b</sup> ; Liguori, Consolatina <sup>b</sup> ; Singh, Satya P. <sup>c</sup> ; Rahman, Md Zia Uhr <sup>d</sup> .; Veneziano, Domenico <sup>e</sup>	26
27	A Complete Home Automation Strategy Using Internet Of Things Bheesetti, Deva Sai Kumar; Bhogadi, Venkata Nikhil; Kintali, Saran Kumar; Zia Ur Rahman, Md.	27
28	Energy Detection In Cognitive Radio Applications Using Logarithmic Square Adaptive Learning Surekha, Sala <sup>a</sup> ; Mantravadi, Nagesh <sup>a</sup> ; Mirza, Shafi Shahsavari <sup>b</sup> ; Zia Ur Rahman, Md <sup>a</sup>	28
29	Effect Of Zno Nanoparticles On Optical Textures And Image Analysis Properties Of 7O.O5 Liquid Crystalline Compound Srilekha, Gandu <sup>a</sup> ; Pardhasaradhi, Pokkunuri <sup>a</sup> ; Madhav,	29

Boddapati Taraka Phani<sup>a</sup>; Nanchara Rao, Manepalli  
Ramakrishna<sup>b</sup>

- 30 Concentric Ring Structured Reconfigurable Antenna Using Mems Switches For Wireless Communication Applications Prasad, G Ram; Madhav B.T.P.; Pardhasaradhi P.; Devi, Y Usha; Nadh, B Prudhvi; Anilkumar T.; Rao, M Venkateswara 30
- 31 Identification of Thermo Optical Parameters In 4<sup>1</sup>-Hexyloxy-4-Cyanobiphenyl With Dispersed Zno Nano Particles Pardhasaradhi, Pokkunuri<sup>a</sup>; Taraka Phani Madhav, Boddapati<sup>a</sup>; Srilekha, Gandu<sup>a, c</sup>; Ramakrishna Nanchara Rao, Manepalli<sup>b</sup>; Venkata Ganesh, Gorla<sup>a</sup> 31
- 32 Low Power, High Speed Vlsi Circuits In 16NM Technology Sudhakar Alluri<sup>1, a</sup>, Balaji<sup>2</sup>, Ch. CXU<sup>1</sup> 32
- 33 Reconfigurable Antennas For Rfid/Gps/Wimax/Wlan Applications Using Rf Mems Switches Lakshmi Narayana Thalluri, K. Srinivasa Rao, G. Venkata Hari Prasad, S. S. Kiran, Koushik Guha, Appala Raju Kanakala & P. Bose Babu 33
- 34 Design and Analysis Of Mems Electrospray Thruster Device K. Srinivasa Rao<sup>1</sup> · Shaik Shoukat Vali<sup>1</sup> · P. Ashok Kumar<sup>1</sup> · K. Girija Sravani<sup>1, 2</sup> 34
- 35 Design And Simulation Of Bi-Metallic Rf Mems Switch For Fast Switching Time K. Srinivasa Rao, Sk. Shoukath Vali, K. Girija Sravani, P. Ashok Kumar & Koushik Guha 35
- 36 Experiment And Fem Analysis Of Silica Nanoparticle-Based Impedance Immunosensor For Sensitivity Enhancement N. Das, V. Damodaran, B. Chakraborty, C. Raychaudhuri 36
- 37 A Hybridized Model For The Prediction Of Heart Disease Using MI Algorithms T Penchala Naidu, K Amar Gopal, Sk Rameez Ahmed, R. Revathi, Sk Hasane Ahammad, V Rajesh, Syed Inthiyaz, K Saikumar 37
- 38 Surveillance And Obstacle Avoiding Autonomous Robot S. Rooban, C. Joshitha Idupulapati Venkata Sai Eshwar Mary swarna Latha Gade 38

39	Quantitative Evaluation Of Different Thresholding Methods Using Automatic Reference Image Creation Via Pca Susant Kumar Panigrahi <sup>a</sup> , Supratim Gupta <sup>b</sup> and S Vamsee Krishna <sup>a</sup>	39
40	Shape And Texture Features Extraction Using Segmented Histopathological Images U. Rajyalakshmi, K. Satya Prasad & S. Koteswara Rao	40
41	Application Of Sigma Point Particle Filter Method For Passive State Estimation In Underwater G. Naga Divya, S. Koteswara Rao	41
42	Acceptance Criteria Of Bearings-Only Passive Target Tracking Solution S.Koteswara Rao <sup>1</sup> , M. Kavitha Lakshmi <sup>2</sup> , Kausar Jahan <sup>1</sup> , G. Naga Divya <sup>1</sup> and B. Omkar Lakshmi Jagan <sup>1</sup>	42
43	Executing Cnn-Lstm Algorithm For Recognizable Proof Of Cervical Spondylosis Infection On Spinal Cord Mri Image: Machine Learning Image Sasank V. V. S. Kranthi Kumar Singamaneni , A. Sampath Dakshina Murthy, S. K. Hasane Ahammad	43
44	The Categorization Of Artificial Intelligence (Ai) Based On The Autonomous Vehicles And Its Other Applications S. V. Aswin Kumer, P. Kanakaraja, L. S. P. Sairam Nadipalli, N. V. K. Ramesh & Sarat K. Kotamraju	44
45	Lane Detector For Driver Assistance Systems Sivasankari S.A.; Agilesh Saravanan R.; Bennilo Fernandes J.; Kumar K.T.P.S.	45
46	Performance Optimisation Within Device Layer Of Iot Networks Sowmya K.V. <sup>a</sup> ; Sastry J.K.R. <sup>b</sup>	46
47	Design Of 32-Bit Cell-Based Carry-Save Combinational Multiplier With Reduced Area And Propagation Delay Suman, Shruti <sup>a</sup> , Singh, Ngangbam Phalguni <sup>a</sup> ; Selvakumar R. <sup>a</sup> ; Saini, Harshita <sup>b</sup>	47
48	Machine Learning Based Deep Job Exploration And Secure Transactions In Virtual Private Cloud Systems Rajasoundaran S. <sup>a</sup> ; Prabu A.V. <sup>b</sup> ; Routray, Sidheswar <sup>b</sup> ;	48

	Kumar, S.V.N. Santhosh <sup>c</sup> ; Malla, Prince Priya <sup>b</sup> ; Maloji, Suman <sup>b</sup> ; Mukherjee, Amrit <sup>d</sup> ; Ghosh, Uttam <sup>e</sup>	
49	Secure Opportunistic Watchdog Production in Wireless Sensor Networks: A Review Rajasoundaran S. <sup>a</sup> ; Prabu A.V. <sup>b,c</sup> ; Kumar, G. Sateesh <sup>d</sup> ; Malla, Prince Priya <sup>b</sup> ; Routray, Sidheswar <sup>b</sup>	49
50	Surface Modified Chitosan With Cadmium Sulfide Quantum Dots As Luminescent Probe For Detection Of Silver IONS Santhosh, Chella; Ernest Ravindran R.S.	50
51	Design Of Micropump With Two Stacked Ring Type Piezoelectric Actuators For Drug Delivery Sravani, Kondavitee Girija <sup>a</sup> ; Ramakrishna, Desala <sup>a,b</sup> ; Chandh, Prakash <sup>b</sup> ; Sathvik, Kuncham <sup>a</sup> ; Rao, Karumuri Srinivasa <sup>a</sup>	51
52	Assessment Of Iri-2016 Hmf2 Model Predictions With Cosmic Observations Over The African Region Moses, Mefe <sup>a</sup> ; Bilitza, Dieter <sup>b,c</sup> ; Panda, Sampad Kumar <sup>d</sup> ; Ochonugor, Blessing James <sup>c</sup>	52
53	Comparison Between Swarm Measured And Iri-2016, Iri-Plas 2017 Modeled Electron Density Over Low And Mid Latitude Region Singh, Arun Kumar <sup>a,b</sup> ; Maltseva, Olga <sup>c</sup> ; Panda, Sampad Kumar <sup>d</sup>	53
54	Concentric Ring Structured Reconfigurable Antenna Using Mems Switches For Wireless Communication Applications Prasad, G Ram; Madhav B.T.P.; Pardhasaradhi P.; Devi, Y Usha; Nadh, B Prudhvi; Anilkumar T.; Rao, M Venkateswara	54
55	Design And Analysis Of A Capacitive Mems Accelerometer As A Wearable Sensor In Identifying Low-Frequency Vibration Profiles Preeti M. <sup>a,b</sup> ; Guha, Koushik <sup>a</sup> ; Baishnab K.L. <sup>a</sup> ; Sastry A.S.C.S. <sup>b</sup>	55
56	Design Of Elliptical-Shaped Reconfigurable Patch Antenna With Shunt Capacitive Rf-Mems Switch For Satellite Applications Sailaja, Bokkisam Venkata Sai; Naik, Ketavath Kumar	56

57	Improvement Of Wider Bandwidth Using Dual E–Shaped Antenna For Wireless Communications In 5g Applications Naik, Ketavath Kumar	57
58	A Real and Accurate Diabetes Detection Using Voting-Based Machine Learning Approach Satish Varma, Udimudi <sup>a</sup> ; Dhiraj V. <sup>a</sup> ; Sekhar Babu B. <sup>a</sup> ; Dheeraj Varma V. <sup>a</sup> ; Karthik, Gudipati Bharadwaja Sri <sup>a</sup> ; Rajesh V. <sup>b</sup>	58
59	MRI Brain Image Segmentation By Using A Deep Spectrum Image Translation Network Gajula, Srinivasarao; Rajesh V.	59
60	ANN-based liquid level transmitter using force resistive sensor for minimisation of hysteresis and non-linearity error Anamika Lata , Nirupama Mandal	60
61	Multifunctional Electrode Polarization Impedance-Based Sensor for Calculating Flow Rate and Conductivity of Fluid Anamika Lata , Ishita Bhar , and Nirupama Mandal ,	61
62	Traffic Monitoring In Smart Cities Using Internet of Things Assisted Robotics Muruganantham Ponnusamy , Aravindhan Alagarsamy	62
63	Canal Top Solar Panels: A Unique Nexus Of Energy, Water, And Land P.M.N. Sairam A Aravindhan	63
64	Computationally Decoding Nudf Residues To Enhance The Yield of The Dxp Pathway Devi Prasanna Ashish Runthala	64
65	Comparative Device Performance Of Czts Solar Cell With Alternative Back Contact Atul Kumar, Ngangbam PhalguniSingh Arunmetha Sundaramoorthy	65
66	ICLM: Empirical Evaluation Of Rheumatoid Arthritis Disorder Using Image Classification And Linear Mapping Principles Mohana Sundari L. Senthil Kumar T ,Nagarajan P. ,Rajendranath U.N.V.P. <sup>d</sup> .; Phalguni Singh, Ngangbam	66

67	Design and Analysis of EBG Antenna For Wi-Fi, Lte, And Wlan Applications Pronami Bora, P. Pardhasaradhi, and B. T. P. Madhav	67
68	Smart Real Time Health Monitoring System Using Arduino And Raspberry PI PronamiBoraP. KanakarajaB. ChiranjeeviM. Jyothi Sri SaiA. Jeswanth	68
69	Design and Implementation Of Smart Energy Meter Using Lora-Wan And Iot Applications Kanakaraja P. Upadhyay, Sourabh; Kotamraju, Sarat K; Venkata Sai Suneela G.; Neelesh, Rudra	69
70	Extracting Behavior Identification Features For Monitoring And Managing Speech-Dependent Smart Mental Illness Healthcare Systems Alka Londhe,P. V. R. D. Prasada Rao,Shrikant Upadhyay,Rituraj Jain	70
71	Assessment of Ionospheric Variability From IRI-2016, SPIM-2017, and IGS-Gim Using Digisonde And Gps Observations Over Cyprus Sampad Kumar Pand· Kanaka Durga Reddy battul· Haris Haralambous· Sunil Kumar Sharma	71
72	Novel Defense Framework For Cross-Layer Attacks In Cognitive Radio Networks Davanam, Ganesh , Pavan Kumar T.; Sunil Kumar M.	72
73	Recent Progress in Surface Plasmon Resonance Based Sensors: A Comprehensive Review VasimallaYesudasu <sup>a</sup> Himansu ShekharPradhan <sup>a</sup> Rahul JasvanthbhaiPandya <sup>b</sup>	73
74	SPR Performance Enhancement For Dna Hybridization Employing Black Phosphorus, Silver, And Silicon Yesudasu Vasimalla, Himansu Shekhar Pradhan, and Rahul Jashvantbhai Pandya	74
75	T-Fed For End-Fire Pattern Of Log-Periodic Microstrip Array Arjuna Muduli1   Rabindra K Mishra	75
76	Iot Based Smart Energy Meter Using GSM ChellaSanthoshS.V.Aswin KumerJ.Gopi KrishnaM.VaishnaviP.SairamP.Kasulu	76

77	Early Estimation Model For 3d–Discrete Indian Sign Language Recognition Using Graph Matching E.Kiran Kumara , P.V.V.Kishorea,* , D.Anil Kumara , M.Teja Kiran Kumar	77
78	Design and Implementation of IOT Based Smart Streetlights Systems K Praghash,Eluri Dhathri,S Arunmetha,Naru Mohan Reddy,Pamarthi Kanakaraja,Swetha Guruju	78
79	An Experimental Crack Evolution Of Concrete With Fly-Ash And Hybrid Fibers S.S. Asadi , Sai Pavan Asadi , Sai Sowmya Asadi , Suseela Alla , M. Sujatha	79
80	Stability Indicating Rp-Hplc Method for The Analysis of Dacomitinib and Its Related Impurities in Bulk and Oral Solid Dosage Formulations Venu Kamani; M. Sujatha; G. S. N. Koteswara Rao; N. Vinod Kumar	80
81	Implementation of Sequence Detector Using Optimized GDI Technique Prasanna Kumar K, Kishore Sanapala, V S V Prabhakar, D. Pavan	81
82	Triple Notch Slotted Monopole Antenna With Complementary Split Ring Resonators B.T.P. Madhav; U. Ramya; P. Lakshman; V.S.V. Prabhakar; M. Venkateswara Rao	82
83	Modified Analysis of SMO, PSO, GWO and ABC Algorithms for MPPT in Photo-Voltaic Systems Dr.K.Subba Rao <sup>1</sup>	83
84	Design of Z-source Inverter for Electric Vehicle Dr.A. Anand Kumar <sup>1</sup>	84
85	Electricity Generation Using Solar Power <sup>1</sup> Dr.J. Somlal	85
86	IOT based WPT powered Automatic Sanitize Dispenser P Prudhvi Venkata Sai, <sup>1</sup> Charan Sai Tiruvuri, <sup>2</sup> Dr S V N L Lalitha, <sup>3</sup> Kalyan Dusarlapudi	86

87	Experimental Determination of State of Charge of Li-ion Battery <sup>1</sup> M. Govardhan , <sup>1</sup> A.V.S Sai Pavan kumar , <sup>2</sup> K.Narsimha Raju	87
88	State of Charge Estimation Approach for Electric Vehicles using Multivariate Regression and k-Nearest Neighbor Regression <sup>1</sup> T. Trinadh , <sup>2</sup> K.Narsimha Raju	88
89	A Comprehensive Study on Shunt Active Power Filters for Grid – Tied Wind Systems N. Keerthi <sup>1</sup> , A. Pandian <sup>2</sup>	89
90	Analysis of Modified Quasi-ZSI In DCC And CC Modes <sup>1</sup> Venkat Ramana.S, <sup>2</sup> A.Pandian	90
91	Enhanced Low Voltage Panel Switchgear Power System Design by Selecting Air Circuit Breakers (ACB) As a Function of Temperature <sup>1</sup> Dinakar Yeddu , <sup>2</sup> B.Loveswara Rao	91
92	Enhanced Pantograph Charger Design for Electric Bus using a Solid State Transformer Dinakar Yeddu <sup>1</sup> ,B.Loveswara Rao <sup>2</sup>	92
93	Energy Management In A DC Microgrid With Energy Storage System P Srinivasa Varma <sup>1</sup> , T Vijaya Muni <sup>2</sup> , S Raja Sekhar <sup>3</sup>	93
94	Novel switching design structure for three phase 21-level multilevel inverter fed BLDC drive application P Srinivasa Varma <sup>1</sup> , R B R Prakash <sup>2</sup> , A Pandian <sup>3</sup>	94
95	Dynamic Model Development for Lead Acid Storage Battery <sup>1</sup> M Kiran Kumar, <sup>2</sup> B V Rajanna	95
96	Performance Enhancement of Asynchronous Machine With Super Capacitor <sup>1</sup> M Kiran Kumar, <sup>2</sup> T Vijay Muni	96
97	A Literature Review on Bidirectional DC-DC Converter Owing to Electric Vehicle Charging Station with Merest Transformers Boya Anil Kumar <sup>1</sup> , Dr.B.Jyothi <sup>2</sup>	97

98	Dynamic Response of Permanent Magnet Synchronous Generator Based Wind Firm during Abnormal Conditions <sup>1</sup> R B R Prakash, <sup>2</sup> T Narendra, <sup>2</sup> K Parvesh	98
99	Power Management Strategy Between Pv-Wind Hybrid System Using MPPT Techniques Mrs K.Sarada <sup>1</sup> , Ch.V.Bala Subrahmanyam <sup>2</sup>	99
100	Optimal Placement and Sizing of DG for Loss Minimization Using ABC Optimization <sup>1</sup> Harsh Bala Vardhan, <sup>2</sup> K. Sarada	100
101	An Internal Current Controlled BLDC Motor Drive Supplied with PV Fed High Voltage Gain DC-DC Converter <sup>1</sup> G.G. Raja Sekhar	101
102	A Solar PV-Powered BLDC Drive for EVs to get Flexible Energy Control Functions <sup>1</sup> Tadivaka Teja Sreenu , <sup>2</sup> Lalitha, S. V.N.L	102
103	BLDC Motor Rotor Position Estimation in the Absence of Sensors Tadivaka Teja Sreenu <sup>1</sup> , Lalitha, S. V.N.L <sup>2</sup>	103
104	Efficient Control and Battery Bank Optimization for PV Assisted Electric Vehicle Charging Infrastructure <sup>1</sup> N Srinath, <sup>1</sup> G Dinesh, <sup>2</sup> S Ravi Teja	104
105	Power Source Scheduling and Control of Solar PV Assisted Electric Vechicle Charging Station <sup>1</sup> S Chandana, <sup>2</sup> S Ravi Teja	105
106	Novel Programmable Solar Based SIMO Converter for SMPS Applications with IOT Infrastructure <sup>1</sup> Sumanjali Chundu, <sup>2</sup> Kalyan Dusarlapudi	106
107	Path Controlled Self-Balanced Robot For Uv Sanitization Application Shaik Afroz <sup>1</sup> , R Sai Rohan Reddy <sup>1</sup> , Kalyan Dusarlapudi <sup>2</sup>	107
108	Review of Multilevel Inverters for PV Energy System Applications <sup>1</sup> T Vijay Muni	108

109	A Review Paper on Electricity Generation from Solar Energy T Vijay Muni <sup>1</sup>	109
110	IOT BASED BI—DIRECTIONAL METER Sudha Dukkipati <sup>1</sup>	110
111	Improving Reliability of Distribution System using Demand Response Sudha Dukkipati <sup>1</sup>	111
112	Impact of Electric Vehicles to improve the reliability of IEEE 14 bus System Md Ayan <sup>1</sup> G Swapna <sup>2</sup>	112
113	Interfacing of Wind Energy Conversion System With Solid State Transformer For Seamless Fault Ride Through Operation <sup>1</sup> Pravallika, <sup>1</sup> Anjana Kumari, <sup>2</sup> S Rajasekhar	113
114	A Machine Learning Scheme to Identify Coherency of Generators in Power Systems <sup>1</sup> Muppala Hari Srinivasa Prasad , <sup>2</sup> Naga Chaitanya Munukutla, <sup>3</sup> Kalyan Dusarlapudi	114
115	A Wavelet Approach to Controlled Islanding of Power Systems Naga Chaitanya Munukutla <sup>1</sup>	115
116	SEPIC Converter based Power Factor Correction for BLDC Motor <sup>1</sup> P. Tarun Kumar, <sup>1</sup> V. Sri Vardhan, <sup>2</sup> T Teja Sreenu	116
117	Speed Control of Axial-Flux Permanent Magnetic Synchronous Motor using PI Controller <sup>1</sup> Haswanth Kalidindi, <sup>1</sup> Praveen Sai Patapati, <sup>2</sup> B. Jyothi	117
118	An Embedded Prototype for Monitoring and Control of Air Conditioner Appliance <sup>1</sup> B. VineshKumaar, <sup>2</sup> Mr.D. Kalyan	118
119	Bi-directional VSI Based Regenerative Braking for Electric Vehicles Employing BLDC Motor <sup>1</sup> G Satya Kalyani, <sup>2</sup> G G Raja Sekhar	119

120	Solar Inverter Tripping Identification <sup>1</sup> K. Kalyan Krishna, <sup>1</sup> Shaik Shoyab Aslam Pasha, <sup>2</sup> Kuthuri Narasimha Raju	120
121	Design of A 48V 13S Battery Management System for Enhanced Electric Vehicle Performance <sup>1</sup> G.Naga Pavan, <sup>1</sup> S.Subbarao, <sup>2</sup> Kuthuri Narasimha Raju,	121
122	Transmission Line Fault Analysis using GSM <sup>1</sup> Sk.Asalam, <sup>1</sup> M.Sai Kumar, <sup>2</sup> G.G.Raja Sekhar	122
123	Novel IoT & Machine Learning Base Water Flow Monitoring System <sup>1</sup> Kanakadandi Venkata Chaitanya Bharadwaj, <sup>2</sup> Dusarlapudi Kalyan	123
124	Accelerometer Based Intra-Wireless Communication in Electric Vehicle Gudlooru Sai Horak, Ejji William Cary, Dusarlapudi Kalyan	124
125	Development of IOT based Smart Street Lighting System <sup>1</sup> Srija Gouram, <sup>2</sup> J. Somlal	125
126	Modeling of Electric Engine <sup>1</sup> K.Sri Harshavardhan, <sup>1</sup> P.Vinay Vardan, <sup>2</sup> B. Jyothi	126
127	Design of Dynamic Wireless Power Transfer System For Electric Vehicle <sup>1</sup> D. Abdul Kalam, <sup>1</sup> Syed Abdul Hafeez, <sup>2</sup> Jarupula Somlal	127
128	Demonstrating the Predominance of Time Delays on Frequency Regulation of Dual Area Realistic Power System under 2DOFPID Controller <sup>1</sup> Kiran Kumar,	128
129	A Hybrid Energy Storage System with a Modern Design for Rechargeable Vehicles <sup>1</sup> Kambhampati Venkata Govardhan Rao, <sup>2</sup> Malligunta Kiran Kumar	129
130	Development of control strategy for an energy efficient Heating Ventilation and Air Conditioning System <sup>1</sup> Sravani Ravipudi, <sup>2</sup> R.B.R.Prakash	130

131	A Relative Analysis of Enhanced Machine Learning Algorithm SVM & Decision Tree to Predict Smart Grid Stability <sup>1</sup> V. Dharani, <sup>2</sup> Pinni Srinivasa Varma	131
132	Performance Evaluation of Micro-Grid with Hybrid PSO Algorithm <sup>1</sup> A. Pandian, <sup>2</sup> T. Vijay Muni	132
133	Agriculture practices with smart sensors Dr. Md Ali Hussain	133
134	Survey on Various Cloud Security Methods K.V.Daya Sagar	134
135	Health Insurance using Blockchain Technology P.S.G.Aruna Sri,	135
136	LoRa Network Development and Placement: A Terrestrial Navigation Systems <sup>1</sup> J R K Kumar Dabbakuti, <sup>2</sup> A Kiran Kumar	136
137	Cuckoo Search Based Collaborative Movie Recommendation System M .Kameswara Rao	137
138	CLSTM: A Deep Learning Model for Tumor Segmentation from Mammography Images <sup>1</sup> Narendra Babu Tatini, <sup>2</sup> J R K Kumar Dabbakuti	138
139	Smart sensors and their applications Dr. Md Ali Hussain	139
140	Real-time Embedded Automotive Dynamic Framework using Convolutional Neural Network <sup>1</sup> J R K Kumar Dabbakuti, <sup>2</sup> Pushpak Sivasai Raju	140
141	Secure Database using Blockchain Driven Watermarking P.S.G.Aruna Sri,	141
142	Botdet and Taxanomy Botnet Detection K.V.Daya Sagar	142
143	Facial Land Marks based Head Pose Estimation Classification M .Kameswara Rao	143

144	Seq2seq-LSTM Deep Neural Network to Generate Worthwhile News about Disasters. <sup>1</sup> Narendra Babu Tatini, <sup>2</sup> Sridevi Sakhamuri	144
145	Search in Spoken Audio From Low-Resource Indian Languages Nadimpalli Vijaya Lakshmi V <sup>a</sup> , Kesiraju Santosh <sup>b</sup> , Banka Rohith <sup>c</sup> , Kethireddy, Rashmi <sup>d</sup> , Gangashetty Suryakanth V <sup>e</sup>	145
146	Exploration of temporal dynamics of frequency domain linear predictioncepstral coefficients for dialect classification Kethireddy Rashmi <sup>a</sup> , Kadiri Sudarsana Reddy <sup>b</sup> , Gangashetty Suryakanth V <sup>c</sup>	146
147	NMF-weighted SRP for multi-speaker direction of arrival estimation: robustness to spatial aliasing while exploiting sparsity in the atom-timedomain Thakallapalli Sushmita <sup>a</sup> , Gangashetty Suryakanth V <sup>a,b</sup> , Madhu Nilesh <sup>c</sup>	147
148	Implementation of a novel P&O MPPT Controller for Photovoltaic System at Standard Test Conditions Venkata Ratnam Kolluru <sup>1</sup>	148
149	Intrusion Detection System using AI and Machine Learning Algorithm Syam Akhil Repalle <sup>1</sup> , Venkata Ratnam Kolluru <sup>2</sup>	149
150	All in One Home Automation Dr. B.B.V. Satya Vara Prasad <sup>1</sup>	150
151	A Review on IoT based Indoor Air Quality Monitoring System Dr. B.B.V. Satya Vara Prasad <sup>1</sup>	151
152	Using deep convolutional neural networks and AI, a system for automatically managing attendance <sup>1</sup> Sridevi Sakhamuri, <sup>2</sup> J RajaSekhar	152
153	Design of hybrid soft computing methods for calculating the output of suspended silt in India's Godavari River <sup>1</sup> Sridevi Sakhamuri, <sup>2</sup> J RajaSekhar	153
154	Application of IoT in Hospital Management J Rajasekhar	154
155	Home Automation Using Telegram BOT J Rajasekhar	155



## IMAGE CAPTIONING USING DEEP LEARNING

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### *Abstract*

The task of image caption generator is mainly about extracting the features and ongoings of an image and generating human-readable captions that translate the features of the objects in the image. The contents of an image can be described by having knowledge about natural language processing and computer vision. The features can be extracted using convolution neural networks which makes use of transfer learning to implement the exception model. It stands for extreme inception, which has a feature extraction base with 36 convolution layers. This shows accurate results when compared with the other CNNs. Recurrent neural networks are used for describing the image and to generate accurate sentences. The feature vector that is extracted by using the CNN is fed to the LSTM. The Flickr 8k dataset is used to train the network in which the data is labeled properly. The model will be able to generate accurate captions that nearly describe the activities carried in the image when an input image is given to it. Further, the authors use the BLEU scores to validate the model.



## A HYBRID METHOD TO REDUCE PAPR OF OFDM TO SUPPORT 5G TECHNOLOGY

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### Abstract

The orthogonal frequency division multiplexing (OFDM) is a multicarrier modulation scheme used for the transfer of multimedia data. Well-known systems like ADSL (asymmetric digital subscriber line) internet, wireless local area networks (LANs), long-term evolution (LTE), and 5G technologies use OFDM. The major limitation of OFDM is the high peak-to-average power ratio (PAPR). High PAPR lowers the power efficiency, thus impeding the implementation of OFDM. The PAPR problem is more significant in an uplink. A high peak-to-average power ratio (PAPR) occurs due to large envelope fluctuations in OFDM signal and requires a highly linear high-power amplifier (HPA). Power amplifiers with a large linear range are expensive, bulky, and difficult to manufacture. In order to reduce the PAPR, a hybrid technique is proposed in this chapter with repeated clipping and filtering (RCF) and precoding techniques. The proposed method is improving the PAPR as well as BER. Five types of pre-coding techniques are used and then compared with each other.



## IMPROVED DESIGN DEBUGGING ARCHITECTURE USING LOW POWER SERIAL COMMUNICATION PROTOCOLS FOR SIGNAL PROCESSING APPLICATIONS

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### Abstract

Now-a-days FPGA designers are facing the problem of unprecedented challenges in debugging their designs. In the past, designers debugged their FPGAs by plugging them onto a board and then analyzing them with probes and logic analyzers. But right now the vendors of FPGA are offering tools that make it somewhat easier to probe internal design signals inside the FPGA, Once unexpected behavior is observed, on-chip debug is notoriously difficult; typically a design is instrumented with on-chip trace buffers that record the run-time behavior for later interrogation. Based on the demand for verification leads to an increase in FPGA-based tools that improves the performance of the architecture. The low power communication protocols can run at much higher operating frequencies with less area.FPGAs provide a promising implementation option for many DSP applications particularly in speech signal processing devices such as data converters, digital filters, etc. This work proposes a novel design debugging architecture based on implementation of reconfigurable insertion technique with the help of low power communication protocols used in the FIR filter to debug the entire architecture with less area. If there is any possibility of bug occurs in the UART protocol then the data is transferred through SPI protocol. SPI protocol worked in the operating frequency of 330.12 MHz. According to the power consumption, the UART protocol consumes 0.0135W which is far better than other protocols like SPI, I2C etc. The design debugging architecture is developed using Verilog HDL and implemented on FPGA with the help of Xilinx ISE tool. © 2021, Springer Science+Business Media, LLC, part of Springer Nature.

**Author keywords:** Field programmable gate array; FIR filter; FSM controller; Reconfigurable buffers; SPI; UART



## ESTIMATION OF INTRAPULSE MODULATION PARAMETERS OF LPI RADAR UNDER NOISY CONDITIONS

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### Abstract

Low probability of intercept (LPI) radars utilize specially designed waveforms for intra-pulse modulation and hence LPI radars cannot be easily intercepted by passive receivers. The waveforms include linear frequency modulation, nonlinear frequency modulation, polyphase, and polytime codes. The advantages of LPI radar are wide bandwidth, frequency variability, low power, and the ability to hide their emissions. On the other hand, the main purpose of intercept receiver is to classify and estimate the parameters of the waveforms even when the signals are contaminated with noise. Precise measurement of the parameters will provide necessary information about a threat to the radar so that the electronic attack or electronic warfare support system could take instantaneous counter action against the enemy. In this work, noisy polyphase and polytime coded waveforms are analyzed using cyclostationary (CS) algorithm. To improve the signal quality, the noisy signal is pre-processed using two types of denoising filters. The denoised signal is analyzed using CS techniques and the coefficients of spectral correlation density are computed. With this method, modulation parameters of nine types of waveforms up to -12 dB signal-to-noise ratio with an accuracy of better than 95% are extracted. When compared with literature values, it is found that the results are superior.

Author keywords: Barker; Bi frequency; contour plot;  
autocorrelationfunction; cyclostationary; denoising; LPI; spectral correlation density



## INVESTIGATIONS ON GRAPHENE-BASED ULTRA-WIDEBAND (UWB) MICROSTRIP PATCH ANTENNAS FOR TERAHERTZ (THZ) APPLICATIONS

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### Abstract

An investigation on graphene-based hexagonal microstrip patch antenna has been carried out in this article. The hexagonal-shaped radiators have been designed and modified by incorporating a U-shaped slot and an elliptical-shaped slot on the surface of the patches, respectively, to enhance the radiation performance of the suggested structures. The proposed structures are simulated over an ultra-wideband frequency (UWB) for terahertz applications. The comparative studies have been performed to investigate the effects of the incorporated U-shaped and elliptical-shaped slots on the radiation performance of the proposed graphene-based antenna structures. A significant improvement in gain and directivity is noticed for the elliptical slot-loaded structure. Both the proposed U-shaped and elliptical-shaped slot loaded hexagonal printed antennas offer an impedance bandwidth ranging from 0.68 to 1.63 THz for  $S_{11} \leq -10$  dB. The obtained reflection coefficient and VSWR ensure perfect impedance matching throughout the operating band for the suggested structures. The proposed antenna can be useful for ultra-wideband applications in the terahertz regime like THz bio-imaging, spectroscopy, explosive detection, medical diagnoses, communication, and weather monitoring. © 2021, The Author(s), under exclusive licence to Springer Science+Business Media, LLC, part of Springer Nature.

**Author keywords:** patchantenna; Radiationcharacteristics; Terahertz; Ultra-wideband (UWB) Graphene; Microstrip



## ANALYSIS, DESIGN AND FABRICATION OF A SQUARE SLOT LOADED (SSL) MILLIMETRE-WAVE PATCH ANTENNA ARRAY FOR 5G APPLICATIONS

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### Abstract

A new compact  $1 \times 4$  microstrip patch antenna array design for future 5G applications is presented in this paper. The proposed antenna array consists of square slot loaded with four radiating patch elements. The corporate feed network has been implemented for the excitation of the array. The feed line is connected to the square slot patch through a quarter-wave transformer matching network. The proposed array is designed on an FR-4 substrate with a dielectric constant of 4.4, thickness of 1.6mm and loss tangent ( $\tan\delta$ ) of 0.02. It has a compact dimension of  $9.590 \times 17.802 \times 1.6\text{mm}^3$ . The proposed structure has been designed and simulated by using commercially available HFSS software. The simulated results (reflection coefficient, gain, efficiency, radiation pattern) are verified through the measurement process to confirm the validity of the design concept. The measurement results are in good agreement with the simulated results. The proposed structure resonates at 38.1GHz with a -10dB impedance bandwidth of about 3700MHz (36.5GHz to 40.2GHz). The reflection coefficient at 38.1GHz is -34dB, with a maximum gain of 7.81dB. The proposed square slot loaded patch antenna array is very promising for 5G communications at 38GHz band (37-40GHz). © 2021 World Scientific Publishing Company.

**Author keywords:** 5G application; Antenna array; gain; MM-wave



## STRUCTURAL, OPTICAL, AND MAGNETIC PROPERTIES OF CD DOPED ZNO NANOMATERIALS FOR OPTOELECTRONIC DEVICE APPLICATION

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### Abstract

Cd-doped ZnO nanopowder is synthesized by solid-state reaction. XRD pattern shows a sharp pinnacle at  $\theta = 36^\circ$  which corresponds to (101) plane. Cd-doped ZnO powder shows a little agglomeration indicating that each grain is made of semicrystalline nature with little humps. FTIR shows a high intense broad IR band at  $4350\text{ cm}^{-1}$  corresponding to the O–H stretching vibration. Raman studies clearly shows that the relays of two different peaks which are observed at  $315$  and  $531\text{ cm}^{-1}$ . Impedance plots state that the decrement in  $Z'$  with expanding recurrence might be because of the increment of the AC conductivity. Dielectric behaviour occurs due to the large formation of grains associated with host lattice. Photosensitivity is found to be as high as 86% at input power of 120 mW. From the optical studies, the bandgap energy is measured and it is found to be 3.15 eV. Photoluminescence studies reveal that the sharp peak tends to move so wide as luminescent range changes from red to blue. The peak which has been seen at 631 nm indicates the green. EPR range demonstrates that Cd particles are in mutilated octahedral sties. The magnetic properties lie in the sample with the Cd fixation expands and the molecules can come close to each other and forms the clusters. These results suggest that these materials can be used for optoelectronic and luminescent device applications. © 2021, The Author(s), under exclusive licence to Springer Science Business Media, LLC, part of Springer Nature.

**Key words:** II-VI semiconductors; Luminescence; Magnetic properties; Nanostructured materials; Optoelectronic devices; Oxide minerals; Semiconductor quantum wells; Solid state reactions; Stretching; Zinc oxide



## INDOOR AND OUTDOOR LOCALIZATION METHODS FOR ADVANCED NAVIGATION SYSTEMS

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### Abstract

The indoor and outdoor localization plays an important role in the domain of the Internet of Things, Advanced IoT, and its applications to enhance the performance and the accuracy of the system. It can be possible by using some wireless and MEMS sensor networks, which help to track and tracing the location of the persons and objects. In the olden days, it is very difficult to find the location of objects and persons. After introducing the GPS, the location finding becomes very easy, but in most of the situations, we cannot get the GPS co-ordinates, and we cannot depend on the GPS. In the absence of GPS, the hall-effect sensor, pressure sensor, Bluetooth beacons, accelerometer, magnetometer, and gyroscope are used to find the location with combined effects on both indoor and outdoor localization.

**Keywords:** Absolute positioning system; Autonomous vehicles; Coordinate system; Inertial sensors; Internet of Things (IoT); LIDAR; Localization methods; Navigation systems; Sampling rate



## LOCALIZATION ALGORITHMS AND APPROACHES FOR NAVIGATION IN ADVANCED IOT APPLICATIONS

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### Abstract

This chapter mainly deals with the current trends and innovations of the localization like inertial measurement units (IMUs) and radio frequency identification (RFID). The above techniques include both indoor and outdoor localization for the Internet of Things applications. The IMUs mainly focus on three algorithms, namely step detection algorithm, stride length detection algorithm, and peak detection algorithm. This chapter also addresses the current scenario of the implementations of both indoor and outdoor localization. The indoor and outdoor localization is widely using mobile phones having inertial measurement units like accelerometer, gyroscope, barometer, and magnetometer. Everybody having their gadgets like mobile phones, tablets, etc., that is measured the sensor data and combined to evaluate the location of a particular person or object with improved accuracy. The tracing and tracking of culprits and missing persons are done by these localization techniques, which is very helpful and suitable for investigation teams in the absence of GPS. © 2021, The Author(s), under exclusive license to Springer Nature Singapore Pte Ltd.

**Keywords:** Global positioning system (GPS); Indoor localization; Inertial measurement units (IMUs); Internet of Things (IoT); Outdoor localization; Peak detection algorithm; Step detection algorithm; Stride length detection algorithm



## THE CATEGORIZATION OF ARTIFICIAL INTELLIGENCE (AI) BASED ON THE AUTONOMOUS VEHICLES AND ITS OTHER APPLICATIONS

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### Abstract

The artificial intelligence (AI) is creating the great impacts and revolution in the technological world, education world, industry world, and business world. The concepts in artificial intelligence are improving themselves day by day, and it is becoming a part of human's everyday activities. It plays a major role in the human life, and the situation becomes the people cannot live without this AI. In this book chapter, the categorization of artificial intelligence based on the autonomous vehicles and its other applications is to be discussed in brief. The artificial intelligence technique is based on the artificial neural network (ANN), machine learning (ML), deep neural network (DNN), recurrent neural network (RNN), and convolution neural network (CNN). To implement these types of neural network, the system should use the programming languages like MATLAB programming.

### Author keywords

Artificial intelligence (AI); Artificial neural network (ANN); Autonomous vehicles; Convolution neural network (CNN); Deep neural network (DNN); Internet of things (IoT); Machine learning (ML); Recurrent neural network (RNN)



## FACE MASK DETECTION USING LABVIEW

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### Abstract

Rapid worldwide spread of Corona virus Disease 2019 (COVID 19) has resulted in a global pandemic. In present scenario due to covid-19, the mask has been an important part of our live for our safety as well as for the others safety so there is a need for efficient face mask detection applications in crowded areas like shopping malls, public transportation etc. To ensure safety of the people in the surroundings. Face Mask Detection using NI LabVIEW. In this project a real-time system is developed to detect whether the person is wearing a mask or not by acquiring a real-time image of him through a Camera. The main challenges in detecting the mask are there are masks with various colours and patterns and secondly the background, light intensity are also the factors that affect the result. So, all these factors should be taken into consideration while developing the system in real-time. This system used for this application consists of vision development module. Vision development module helps to develop applications for machine vision and image processing applications we can use it with LabVIEW for real- time systems. A camera with good pixel quality is used for image acquisition. The captured image is of RGB format, it is difficult to analyse the image in this format, so it undergoes colour plane extraction in this only a single plane of the image is considered which separates the mask from surroundings and results in a grey scale image for further processing. The image later is compared to a custom-made template dataset using pattern matching algorithm from vision assistant which helps to detect the mask region. overlaying techniques are used to highlight the mask region which shows that the person is wearing the mask. © 2021. All Rights Reserved.

**Author keywords:** Colour plane extraction; Face Mask

Detection; LabVIEW; Overlaying; Pattern Matching; Vision Development Module



## AUGMENTATION AND DETECTION OF INDIVIDUAL POSE USING CUDA

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### Abstract

The collective real-time pose prediction is a leading element in allowing algorithms to understand Individuals in videos and pictures. In this study, we are presenting a strategy to determining the pose of various individuals in a picture in real time. Non-parametric procedure is used as representation that we refer this to Part-Affinity-Fields (PAFs) to understand how to connect parts of the body with individuals. This base up framework accomplishes high exactness and real time execution, paying little mind to the quantity of individuals in the picture. In past work of computer vision researchers, PAFs and body part area estimation were refined at the same time across preparing different steps. We show that PAF just clarifying as opposed to both the PAF and content part area refinement brings about a significant increment in each of runtime execution and precision. We likewise propose the main joined body and foot key point identifier, considering an inner commented on foot dataset that we have freely discharged. The joined finder not just diminishes the derivation time contrasted with running them successively, yet in addition keeps up the exactness of every part separately. The work was completed in appearance to Open Pose, chief opensource continuous structure to multiindividual 2D present disclosure, including foot, body, hand, & facial central issues.

**Key words:** Area estimation; Continuous structures; Leading elements; Non-parametric; Open source; Pose predictions; Real time execution; Run-time execution



## DESIGN AND ANALYSIS OF A UWB PATCH ANTENNA FOR WIRELESS IMPLANTABLE BODY AREA NETWORK (WI BAN) APPLICATIONS

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### Abstract

Wireless implantable body area network (Wi BAN) technologies have improved the health monitoring system for the medical diagnostic of instance heart attack, BP(blood pressure) and breast cancer. The aim of present work, to model a UWB (Ultra-Wideband) implantable microstrip patch antenna resonating at 4.8GHz applicable for Wi BAN applications. The designed antenna is modelled on liquid crystal polymer (LCP) substrate by using high frequency structural simulator (HFSS) software. In this work, rectangular patch with 2 L slots have been proposed to achieve the 4.8GHz operating frequency for Wi BAN applications. The antenna parameters such as RC (reflection coefficient), operating BW (Bandwidth), VSWR (Voltage standing wave ratio) and radiation pattern have been analysed to understand the performance of the antenna. The designed antenna is operating from 4.21-5.67 GHz with the bandwidth of 1.46GHz and resonating at 4.8GHz with the reflection coefficient of -43dB. Gain of designed antenna is 7.77dBi at operating frequency. © 2021 IEEE.

### Author keywords

high frequency structural simulator (HFSS); liquid crystal polymer; Ultra- ideband; Wireless implantable body area network



## IMPLEMENTATION OF HYBRID DEEP LEARNING MODEL (LSTM-CNN) FOR IONOSPHERIC TEC FORECASTING USING GPS DATA

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### Abstract

Noticeable advances in the field of man-made reasoning during the previous 10 years and the forward leap of profound learning would be helpful for examining ionospheric weather conditions utilizing ground and space-based ionospheric sensors information. The meaning of profound learning calculations should be surveyed in estimating the low scope ionospheric aggravations (delays) for the worldwide situating framework (GPS) signals. Absolute electron content (Sleuth) informational collections arranged by exploiting GPS satellite radio recurrence (RF) signals. This letter gives the use of profound learning models, long transient memory (LSTM), gated repetitive unit (GRU), and a half and half model that comprises of LSTM joined with convolution brain organization (CNN) to conjecture the ionospheric delays for GPS signals. The profound learning models carried out utilizing the upward Sleuth (VTEC) time-series information assessed from GPS estimations over Bengaluru, Guntur, and Lucknow GPS stations. The LSTM-CNN model performs well when contrasted with other ionospheric profound getting the hang of determining calculations with least root-mean-square blunder (RMSE) of 1.5 Detective units (TECUs) and a serious level of  $R^2=0.99$ .

**Index Terms**— Deep learning, forecast, gated recurrent unit (GRU), global positioning system (GPS), hybrid deep learning model [long short-term memory (LSTM)-convolution neural network (CNN)], ionospheric delays, LSTM.



## SUBSURFACE ANALYSIS USING MACHINE LEARNING

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### ABSTRACT

Subsurface irregularities which are available in the genuine items display their intensity marks in the post accessing techniques with the utilization of nonstationary wave. Nonstationary wave wave imaging has obtained an extraordinary spot in imperfection location and profundity checking for the evaluation of the material's trustworthiness. This paper proposes a grouping component utilizing a hyperplane in view of the help vectors in the gave info and characterizes the pixel area based on its wave force in (BCTWI) Barker Coded Wave Wave Imaging. The current philosophy further develops testability, unwavering quality, and presents better location as far as finding inconsistencies contrasted with customary sign handling procedures.



## PEAK TO AVERAGE POWER RATIO REDUCTION OF ZT DFT-S-OFDM SIGNALS USING HYBRID IMPROVED MONARCH BUTTERFLY OPTIMIZATION-PTS SCHEME WITH TR-CLIPPING SCHEME

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### Abstract

Ebb and flow research on zero-tail discrete Fourier change spread OFDM, an add on to ordinary discrete Fourier change DFT-OFDM regulation without cyclic prefix (CP). Its low power tail is designed for adapting up to channel's defer spread. Worthwhile element of ZT DFT-S-OFDM has drawn scientists for sending it as a potential waveform contender to fifth age (5G). In any case, the natural weakness of high top to average power proportion (PAPR) ought to be mitigated. To work on that work, we propose a cross breed PAPR plot that executes upgraded halfway send succession (PTS) with tone reservation (TR) with cutting strategy. Its prior work stresses for lessening PTS plan's computational intricacy with improved adaptation of ruler butterfly streamlining (MBO) for PAPR decrease in ZT DFT-S-OFDM framework. The proposed model decreased the relationship among the up-and-comer signals. In this paper, we further diminish PAPR by sending TR cutting pair, which decreases the impact of cutting clamor and diminishes ZT DFT-S-OFDM sign's PAPR at same time. The proposed half and half method produce phenomenal PAPR decrease while further developing recipient responsiveness and successful all through. The exhibition examination is finished utilizing the boundaries like PAPR and BER to affirm that this presented plan surpasses current waveforms plans with more efficient plan structure.

**Keywords:** clipping, monarch butterfly optimization, partial transmit sequence, peak to average power ration, tone reservation, zero-tail discrete Fourier transform spread OFDM



## HEAT WAVE CHARACTERISTICS OVER INDIA DURING ENSO EVENTS

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### Abstract

El-Nino Southern Swaying (ENSO) is a significant sea barometrical coupled peculiarity in the Tropical Pacific Sea that impacts the Indian midyear temperatures during April and May. In the ongoing examination, we analysed the effect of ENSO on Indian intensity waves. Temperature zones are distinguished when the greatest temperature surpasses 42°C, especially during April and May over the Indian subcontinent. The outcomes portrayed three distinct locales (west Rajasthan, northwest and southwest UP, and south-focal India) that accomplished the recurrence in days with greatest temperature above 42°C. These methods are contrasted and those of Going before El Nino (PEN), El Nino (EN) and Succeeding El Nino (SEN) occasions. Found PEN and SEN years experienced high sure oddities. It very well may be seen that an expansion in surface temperatures and intensity waves are firmly connected with the reinforcing of north-westerlies and decrease of geopotential level at 500 hPa level, decrease of soil dampness and increment of ocean surface temperatures (SST) during PEN and SEN occasions. The outcomes likewise show that the varieties in temperature and intensity waves over upper east India are unique in relation to the remainder of India during EN and SEN years. The three greatest temperatures districts of (1) west Rajasthan, (2) east Uttar Pradesh, and (3) Vidarbha, are distinguished in light of both the extent and recurrence long periods of above 42°C most extreme temperatures. The range investigation is performed for the month-to-month time series of the days surpassing day to day surface most extreme temperature 42°C for the three locales and recognized the prevailing periodicities with 2.2-2.8 and 3.3-8.5 years, which could be embraced to ENSO and QBO frequencies.

**Keywords:** ENSO, temperatures, heat waves, geopotential height, soil moisture



## A TRIPLE BAND-NOTCHED UWB ANTENNA FOR MICROWAVE IMAGING APPLICATIONS

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### Abstract

In this paper, an exceptional wideband monopole triple band-notched radio wire for microwave imaging applications is proposed. It is planned on 38 X 38 mm 2 Heat proof (FR-4) epoxy substrate. It can stay away from the inductions which ascend from the Wi-MAX (3.3 GHz - 3.7 GHz), WLAN (5 GHz - 6 GHz), and X-band satellite correspondence uplink band (7.9 GHz - 8.4 GHz). Three spaces are acquainted in the transmitting part with accomplish the band dismissal qualities. The planned receiving wire is upgraded by using electromagnetic recreation programming Ansoft HFSS. The model receiving wire is manufactured and tried. The planned receiving wire works in a band from 3.1 to 11 GHz and noticed brilliant radiation qualities. A 50 mm three dimensional bosom model is planned and recreated explicit retention rate values are assessed for glandular, greasy, skin and growth to identify disease in the underlying time.

**Keywords:** Microwave antennas, Wireless LAN, Microwave communication, WiMAX, Ultra-wideband antennas, Specific absorption rate, Microwave imaging



## An Effective Brain Tumour Detection from T1w MR Images Using Active Contour Segmentation Techniques

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### Abstract

In the clinical imaging application, early location of cancers from attractive reverberation imaging (X-ray) mind pictures is a difficult errand, it lessens the gamble of human wellbeing and expands the opportunity of endurance. The manual recognition of mind tissue was requiring a great deal of involvement and tedious. Attractive reverberation pictures (X-ray) filter assists with recognizing cerebrum growths in the beginning phase, and it has turned into a hot examination subject in clinical picture handling. In this examination article, a robotized structure is introduced expected to section and extraction of mind cancers of X-ray pictures in a proficient way. In this work, three essential advances are engaged with the proposed cerebrum cancer division framework including pre-handling, picture thresholding, and division. This article focusses on to concentrate on the exact mind growth division framework by looking at the level set (LSM) and Chan-veese (C-V) strategies. Every one of the analyses are led on Harvard datasets to approve the exhibition of the two techniques. The presentation of the calculations was determined regarding dice coefficient (DC), Hausdorff distance (HD), and Jaccard similitude list (JSI). It has been seen that KIFCM has performed better compared to the next grouping techniques and Chan-Container has shown better execution in cancer location on chose datasets. The general work shows that the introduced structure external performs for the identification of mind growths with least distance mistake and loss of data over existing methods.

**Keywords:** Brain tumour, thresholding, level set, Chan-veese, Hausdorff distance



## SIMULATION AND ANALYSIS OF SMART HOME ARCHITECTURE

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### Abstract

The utilization of cutting-edge innovation in our daily existences has developed step by step. This further developing innovation has made human existence less muddled in finishing our everyday necessities. IoT is one of those trend setting innovations, which is the aftereffect of human interest and a goal to make way of life helpful and more associated, diminishing the work and by annulling the probabilities of human mistakes. Brilliant Home utilizes this IoT to Control Numerous Shrewd Home tasks consequently. The IoT gadgets are appended to the web to screen and control every one of the home machines like opening and shutting the entryway, warming, lighting, disturbing, and cooling. In our examination, we planned shrewd home organization engineering by utilizing a cisco bundle tracer test system. It is the new adaptation of the product where different IoE gadgets that were used for smart home mechanization are consolidated. In the wake of setting up the design, we arranged all home apparatuses to the home entryway through which we will control the gadgets with the assistance of IoT. We likewise showed the reenactment (movement) pictures and their functioning circumstances and overseeing from home passage. A similar reproduction engineering can be carried out continuously with CISCO organizing gadgets. In this we will explore and dissect the outcomes by utilizing Cisco Parcel Follow reproduction apparatus.

**Keywords:** cisco packet tracer simulator, IoT, IoE devices, sensors, VLAN.



## AN IOT ENABLED AIR QUALITY MONITORING SYSTEM USING LORA AND LPWAN

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### Abstract

The execution of conventional air quality checking frameworks has been finished with the assistance of air quality estimating sensors, Zigbee module, a reasonable 16 cycle microcontroller, GSM module, and GPS module. It likewise assists with observing from any distant area by utilizing GSM module. Then again, the customary framework represents a few downsides like expanded power utilization by the ZigBee module, less handling limit of 16 digit microcontroller and expanded execution cost for integrating GSM and GPS module. Afterward, an IoT based observing framework has been created to gauge the air quality however checking and assembling the information from different hubs and showing it in single data set turns out to be more muddled. The hub disappointments may likewise occur on the off chance that the specific hub misfortunes the web association and results in consuming more idleness time. The proposed model can be utilized to productively screen the air quality by utilizing LoRa LPWAN (Low-Power WAN) passages. The significant benefits of the proposed strategy are low power utilization, simple social affair of information from numerous hubs, high handling speed, diminished cost and low dormancy time. Subsequent to getting all the boundary values to show the 20X4 LCD Show locally and transfer any one IoT Cloud stage. Here, this exploration work has proposed the Ubidots IoT Stage, which is extremely intelligent and imaginative to every single boundary noticeable in GUI examination.

**Keywords:** Internet of Things (IoT); LPWAN LoRa; Lora Transceiver; DTH22 sensor; Co2 sensor; CO sensor.



## AUGMENTATION AND DETECTION OF INDIVIDUAL POSE USING CUDA

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### Abstract

The aggregate constant posture expectation is a main component in permitting calculations to grasp People in recordings and pictures. In this review, we are introducing a methodology to deciding the posture of different people in an image progressively. Non-parametric strategy is utilized as portrayal that we allude this to Part-Fondness Fields (PAFs) to comprehend how to interface parts of the body with people. This base up structure achieves high precision and continuous execution, paying little psyche to the amount of people in the image. In past work of PC vision analysts, PAFs and body part region assessment were refined simultaneously across getting ready various advances. We show that PAF simply explaining rather than both the PAF and content part region refinement achieves a huge augmentation in each of runtime execution and accuracy. We moreover propose the vitally joined body and foot central issue identifier, taking into account an internal remarked by walking dataset that we have openly released. The joined locator not simply decreases the determination time appeared differently in relation to running them progressively, yet furthermore keeps up the precision of each and every part independently. The work was finished in appearance to Open Posture, boss opensource constant construction to multiindividual 2D present exposure, including foot, body, hand, and facial focal issues.



## EARLY ESTIMATION MODEL FOR 3D-DISCRETE INDIAN SIGN LANGUAGE RECOGNITION USING GRAPH MATCHING

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### Abstract

Machine interpretation of communication through signing is a basic errand of PC vision. In this work, we propose to utilize 3D movement catch innovation for sign catch and diagram matching for sign acknowledgment. Two issues connected with 3D sign matching are tended to in this work: (1) how to recognize same signs with various number of movement edges and (2) sign extraction from a messiness of non-sign hand movements. These two issues make the 2D or 3D gesture based communication machine interpretation a difficult undertaking. We propose chart coordinating with early assessment model to resolve these issues in two stages. The main stage comprises of intra diagram matching for movement outline extraction, which holds movement serious edges in data set and question 3D recordings. The subsequent stage applies entomb chart coordinating with early assessment model on movement separated inquiry and dataset 3D recordings. The proposed model speeds up the chart coordinating calculation in assessing a sign with less edges. To test the chart matching model, we recorded 350 expressions of Indian gesture based communication with 3D movement catch innovation. For testing 4 varieties for each sign are caught for all signs with 5 unique endorsers at same, more slow, quicker hand rates and sign blended jumbled hand movements. The early assessment chart matching model is tried for precision and productivity in arranging 3D signs with the two actuated continuous limitations. Notwithstanding 3D gesture based communication dataset, the proposed strategy is approved on five benchmark datasets and against the cutting edge chart matching techniques. © 2018 The Creators

**Keywords:** 3D graph matching; 3D motion capture; 3D sign language; Pattern classification; Spatial graph matching; Temporal graph matching



## SMART CONTROL SYSTEM FOR SMART CITY USING IOT

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### Abstract

As advances are presenting and working on step by step, there is a huge change in the applications like "Shrewd City". The Web of Things (IoT) is the best way to deal with join different Sensors with Implanted gadgets to make answers for the ongoing issues and this will assist us with interfacing with Web Society. The term IoT implies controlling the things through Web, in other wording the articles will "talk" to one another and fabricate a correspondence to work or to respond. There are so many eye catching modules in our general public, so in this task we will Execute a model of Shrewd City with around six components like Brilliant Trash Framework, Savvy Water system Framework, Savvy Building, Shrewd Stopping Framework, Café Menu Requesting Framework and Sewer vent Location and Checking Framework that too in a high level manner. And that implies we will make some headway in this multitude of components like Sending messages by utilizing GSM module with Sensor reactions, Sending the data and controlling the parts through cloud stage like ADAFRUIT, getting to site pages through IP Address utilizing Systems administration space, Empowering Advances, Network models and we will make this framework programmed. The primary target of this venture is with no Human Contribution every one of the frameworks or components needs to attempt to make life simpler. The expected advance in this task is Web of Things (IoT), Implanted Frameworks and Systems administration. © 2021. Protected by copyright law.

**Keywords:** ADAFRUIT; Attention-Grabbing; Connectivity Models; Embedded Systems; Enabling Technologies; Internet Society; IP Address; Networking



## **YOLO V2 WITH BIFOLD SKIP: A DEEP LEARNING MODEL FOR VIDEO BASED REAL TIME TRAIN BOGIE PART IDENTIFICATION AND DEFECT DETECTION**

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### **Abstract**

A Train Moving Stock Assessment (TRSE) is a bogie part usefulness examination performed physically across the Rail organizations to guarantee traveler security and continuous rail administrations. There have been endeavors in the past to mechanically update this system to semi-robotized through PC vision (CV) supported models. The CV models use TRS recordings to portion and concentrate bogie parts. Be that as it may, the majority of these models neglect to achieve the planned goal of mechanization, because of computational dormancy in creating continuous results. Subsequently, in this paper, we propose a profound learning way to deal with bogie part ID issue through changed Consequences be damned Convolutional Brain Organization (Just go for it CNN) model with bifold skip engineering. The standard Just go for it engineering is changed by applying early component combination alongside the current late combination to upgrade the recognition abilities of the organization with inadequate preparation information. The preparation information comprises of bogie parts commented on from the train bogie video information. The testing is continued full length bogie recordings. The outcomes show that the proposed design has performed especially well in recognizing bogie parts on different train recordings under various encompassing lighting conditions. This strategy has for sure beaten the prior models utilized for CV based TRSE and comparative Consequences be damned CNN models. © School of Designing, Taylor's College

**Keywords:** Computer vision; Deep learning; Yolo v2; Yolo v2 with bifold skip



## MEDICAL IMAGE MEASUREMENT AND CHARACTERIZATION: EXTRACTING MECHANICAL AND THERMAL STRESSES FOR SURGERY

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### Abstract

Anything that the sort of a medical procedure connected with inward organs, customary or mechanical, the contact with them during medical procedure is a vital second for seeking after the mediation. Contacts through a medical procedure instruments specifically surgical blades, staples, clips, graspers, and so forth are definitive minutes. The point is an extraordinary test in the work to gauge and describe harms. As a general rule, electrical instruments for a medical procedure utilize the accompanying innovations: Ultrasound, radiofrequency (monopolar, and bipolar), and laser. They all outcome in warm harms hard to assess. The article proposes a strategy for a pre-screening of organ highlights during automated a medical procedure meeting by bringing up mechanical and warm burdens. The estimation acquisitions have been performed through a high level outer camera situated over the medical procedure quadrant. The demonstrating and testing have been completed on kidneys. A further relative method has been executed. It depends on PC vision for mechanical technology. The discoveries of human tissue conduct show dependable outcomes. © 2021. The Author(s).

**Keywords:** Bioinstrumentation; Biomechanical and stress; Biomedical measurements; Imaging for cancer detection; Infrared imaging; Laparoscopy; Robotic surgery



## A COMPLETE HOME AUTOMATION STRATEGY USING INTERNET OF THINGS

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### Abstract

In this state-of-the-art world, everybody needs to simplify their lives and get, which can be achieved by utilizing Home Computerization. It is a slanting word that is getting common by virtue of its various lineaments. The idea of IoT renders the opportunity of Execution of Home Mechanization. Web of Things makes it conceivable to control and screen various gadgets through the Web. By associating the IoT gadgets to the Web or Cloud organization, clients can encounter a robotized home. The justification behind this extensive interest for network enabled home computerization frameworks is a result of their straightforwardness, ease, and reasonableness. IoT utilizes a few innovations like distributed computing, which is utilized to interface the IoT gadgets to various stages on the Web and to get to them whenever and anyplace on the planet. In this task, we are utilizing the Blynk stage to screen our associated gadgets through the Web. It gives us different gadgets and user-friendly connection point to control our gadget. To control our gadgets with a voice, we are giving admittance to voice colleagues like Google Voice Right hand, Alexa, Cortana, so on through an electronic help called IFTTT (On the off chance that This, That). A mechanization stage gives correspondence between various electronic administrations, applications, or gadgets. In this undertaking, we are executing a model through which we have some control over and screen every one of the associated sensors and actuators, and we are likewise interfacing them to our voice colleague. © 2021, The Editor(s) (if relevant) and The Author(s), under selective permit to Springer Nature Singapore Pte Ltd.

**Keywords:** Arduino; Blynk; Cloud computing; Home automation; IFTTT; Internet of Things (IoT)



## ENERGY DETECTION IN COGNITIVE RADIO APPLICATIONS USING LOGARITHMIC SQUARE ADAPTIVE LEARNING

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### Abstract

To keep away from range shortage issues in remote correspondences, mental radio idea utilized as dependable and compelling arrangement. To involve appropriate abuse of white sources in mental radios required exact, quick and powerful techniques. In this paper, we proposed new strategy for identifying blank areas in range. In light of this procedure, mental radio performs range detecting through energy location method. Principal curiosity of this paper is versatile calculation i.e., mistake standardized least mean logarithmic square (ENLMLS), it contains the data of essential client presence or nonappearance. Recognizable proof of void areas relies upon element which can further develop avoidance coefficient fundamentally related with finder when contrasted with other versatile calculations. Recreation results shows that proposed ENLMLS calculation performs all around contrasted with LMS calculation through assembly. Further by utilizing cutting capability, it decreases commotion levels and yields missed identification likelihood is more modest by SNR values and predefined limit esteem. © 2021 IEEE.

**Keywords:** adaptive algorithm; cognitive radio; energy detection; spectrum sensing



## EFFECT OF ZNO NANOPARTICLES ON OPTICAL TEXTURES AND IMAGE ANALYSIS PROPERTIES OF 70.05 LIQUID CRYSTALLINE COMPOUND

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### Abstract

The efficient examinations are completed on fluid translucent N-(p-n-heptyloxybenzylidene)-p-n-pentyloxy aniline (70.05) unadulterated compound and with scattering of ZnO nanoparticles in 1 wt% separately. The stage progress investigations of the unadulterated and LC nanocomposite are completed utilizing Polarizing Optical Magnifying instrument (POM) joined with hot stage alongside computerized camera and Differential Filtering Calorimetry (DSC) is utilized to quantify enthalpy and change temperature values. Further the presence of ZnO nano particles in still up in the air by Filtering Electron Microscopy (SEM) examination. It is distinguished that because of scattering of nano particles SmG stage is Extinguished and nematic warm reach is expanded. To upgrade the caught textural pictures, a calculation that utilizations tuned escalation administrators have been proposed in this article. Factual boundaries for upgraded yield pictures are determined and contrasted and existing calculations like Versatile Gamma Remedy (AGC) and Discrete Wavelet Change - Particular Worth Disintegration (DWT-SVD) to figure out the viability of proposed calculation. Further, optical boundaries have been registered to comprehend the thermo optical nature of fluid translucent mixtures. © 2021 Walter de Gruyter GmbH, Berlin/Boston 2021.

**Keywords:** AGC (adaptive gamma correction); DSC (differential scanning calorimetry); DWT-SVD (discrete wavelet transform - singular value decomposition); POM (polarizing optical microscope); SEM (scanning electron microscopy)



## CONCENTRIC RING STRUCTURED RECONFIGURABLE ANTENNA USING MEMS SWITCHES FOR WIRELESS COMMUNICATION APPLICATIONS

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### Abstract

This paper proposes a reconfigurable roundabout microstrip radio wire to serve the remote correspondence applications that make use recurrence groups like ISM (Modern Logical and Clinical), WLAN (Remote Neighborhood), UMTS (Widespread Versatile Media communications Administration). Reconfigurability is accomplished with the assistance of four MEMS (Miniature Electro-Mechanical Frameworks) changes to change the recurrence and radiation properties of the receiving wire. By picking both of the two conditions of every one of the MEMS switches, the span of the roundabout fix is differed and hence the working resounding recurrence. This brings about various designs of the receiving wire to serve for various remote applications. Surrendered Ground Construction is utilized in this plan to bring down the resounding recurrence and work on the transfer speed. Concentric rings are carried out alongside a center round fix to expand the transmitting region of the fix in relationship with the MEMS-based changes to work in switch method of ON and OFF. The concentric rings likewise helping in getting double recurrence conduct of the receiving wire and the deliberate outcomes are showing great concurrence with the reproduction results.

**Keywords:** Concentric ring; MEMS switches; Reconfigurability; Wireless communication



## IDENTIFICATION OF THERMO OPTICAL PARAMETERS IN 4<sup>L</sup>-HEXYLOXY-4-CYANOBYPHENYL WITH DISPERSED ZNO NANO PARTICLES

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### Abstract

In this current article, amalgamation, portrayal, and investigation of optical boundaries through picture improvement techniques have been completed on 4l-hexyloxy-4-cyanobiphenyl (6OCB) unadulterated fluid precious stone (LC) and 6OCB with scattering of 0.5 wt% ZnO nanoparticles. Textural judgments of the combined mixtures are recorded by utilizing SDTECHS POM associated with a hot stage and camera. differential filtering calorimetry (DSC) is utilized to quantify enthalpy and change temperature values. The outcomes show that the scattering of ZnO in 6OCB displays nematic stage as same as the unadulterated 6OCB with somewhat diminished clearing temperature true to form. Further portrayal is completed by different spectroscopic procedures like X-beam diffraction (XRD), examining electron microscopy (SEM), and bright noticeable (UV-Vis) spectroscopy. To assess and recognize the way of behaving of optical boundaries viz optical conveyance (OT), retention coefficient (AC), and stage hindrance (PR) as a component of temperature, a picture handling technique has been proposed, for example enlightenment improvement calculation (IEA) utilizing MATLAB programming. The proposed improvement calculation is one of the easiest and productive calculations to assess the thermo optical boundaries for different electro optical applications. The outcomes are contrasted and the body of the information accessible. © 2021 Walter de Gruyter GmbH, Berlin/Boston.

**Keywords:** optical parameters; POM and DSC; SEM; XRD; ZnO nano particles



## LOW POWER, HIGH SPEED VLSI CIRCUITS IN 16NM TECHNOLOGY

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### ABSTRACT

In this paper offers with simulation of FINFET gadget and subsequent software to a layout of 6 Transistor Static RAM mobile with FINFET as properly as evaluation of sketch troubles and accomplishment metrics of superior SRAM cells. As an initiation, the overall performance of the cautioned 6T-SRAM mobile the usage of FINFET has been evaluated for this operation with low strength domain, displaying smaller SCEs, ultra-small suited time and High stability. The static noise margin, leakage current, strength dissipation & sub threshold cutting-edge of 6 Transistor Static RAM the use of FINFET have been in contrast with MOSFET 6 Transistor Static RAM telephone at 45nm science node. After the first-rate discount in Leakage present day and electricity reduction, the equal method is then carried out to superior SRAM cells. We have in contrast a number of superior proposed SRAM cells the usage of FINFET with the traditional superior MOSFET with Static RAM. The giant leakage discount have been determined when every person swap from traditional MOSFET's to FINFET's. Leakage modern for traditional MOSFET's based totally 7T, 8T, 9T, 10T, 11T & 12T is 74.99 pA, 70.22 pA, 74.83 pA, 67.63 pA, 74.71pA, 63.56 pA and 73.96 pA respectively which have been decreased to 76.550 fA, 76.150 fA, 74.302 fA, 74.012 fA, 70.856 fA and 70.423 fA respectively for superior FINFET primarily based SRAM cells. Power dissipation for traditional MOSFET primarily based 7, 8, 9, 10, 11& 12Transistor is 81.51nW, 80.77nW, 81.47nW, 79.47nW, 81.39nW, 78.59nW and 81.27nW respectively which have decreased to 9.972nW, 9.815nW, 9.565nW, 9.432nW, 9.148nW and 9.046nW respectively for superior FINFET primarily based SRAM cells.

Keywords: MOSFET, SRAM, High speed, Low Area, Leakage power, delay, DSP, VLSI.



## RECONFIGURABLE ANTENNAS FOR RFID/GPS/WIMAX/WLAN APPLICATIONS USING RF MEMS SWITCHES

Lakshmi Narayana Thalluri, K. Srinivasa Rao, G. Venkata Hari Prasad, S. S. Kiran, Koushik Guha, Appala Raju Kanakala & P. Bose Babu

### Abstract

In this paper, we have designed and analysed the overall performance of reconfigurable antennas for wi-fi conversation purposes the usage of RF MEMS switches over the frequency vary of 0.5–7.5 GHz. The proposed reconfigurable antenna is designed with three same shunt capacitive RF MEMS switches with AlN as a dielectric material. The RF MEMS swap used for the diagram of reconfigurable microstrip patch antenna is providing properly overall performance i.e., actuation voltage is 4.5 V, the switching time is forty-five  $\mu$ s. Based on the switching of the RF MEMS switches, the antenna is resonating at 0.9, 1.5, 3.5, 5.4 GHz. So, the antenna designed is successful to serve in a couple of functions like RFID, GPS, WiMAX, and WLAN.

Keywords: Electrostatic actuation, Material analysis, Reconfigurable antenna, RF MEMS switches, Wireless verbal exchange



## DESIGN AND ANALYSIS OF MEMS ELECTROSPRAY THRUSTER DEVICE

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### Abstract

This paper reviews on MEMS primarily based Electro spray Thruster for excessive output velocities, low volume, and excessive throughput. The best feasible dimension of thruster is fixed after doing extra experimental evaluation i.e. cone half of angle, propellant radius, propellant height, and cone height. The most output pace is uptrain, propellant at  $>300 \mu\text{m}$  and propellant radius is modified from 60 to one hundred fifty  $\mu\text{m}$ . Tip attitude with  $46^\circ$ , working voltage various between 2.5 and 3.5 kV. The Electro spray Thruster layout on COMSOL Multiphysics device in laminar flow environment. Propellant inner emitter lift ionic liquid, almost EMI-BF<sub>4</sub> is used as propellant. Output pace of Electro spray Thruster is discovered various enter voltages 2–3.5 kV, accompanying different parameters like 1/2 perspective and top of cone, propellant radius and height. Optimized effect will be produced at cone attitude of  $46.5^\circ$  with peak one hundred thirty  $\mu\text{m}$  and con backside radius a hundred twenty-five  $\mu\text{m}$  alongside with propellant radius one hundred 25  $\mu\text{m}$  propellant peak of one hundred twenty five  $\mu\text{m}$ . The output velocities of thrusters are order of  $10^6$ .

Keywords Propellant · Cone half-angle · Electro spray Thruster · Cone radius · Propellant radius



## DESIGN AND SIMULATION OF BI-METALLIC RF MEMS SWITCH FOR FAST SWITCHING TIME

K. Srinivasa Rao, Sk. Shoukath Vali, K. Girija Sravani, P. Ashok Kumar & Koushik Guha

### **Abstract**

In this paper, the plan of bi-metallic capacitive shunt kind RF MEMS swap is carried out and analyzed the use of FEM tool. The sizeable accomplishments in this work are the pull-in voltage that is minimized to 4.8 V and quick switching time of 7.2  $\mu$ s. The upstate capacitance of the swap is found as 300 fF, down country capacitance as 9.2 pF, which leads to have the capacitance ratio of 30.6. The cloth utilized for CPW line is Gold (Au) and the dielectric fabric utilized in between the beam and the CPW transmission line is Silicon Nitride (Si<sub>3</sub>N<sub>4</sub>). The electromagnetic traits are additionally analysed thru HFSS software.

Keywords: Pull-in voltage, Isolation loss, Upstate capacitance, Down kingdom capacitance, Switching time, CPW transmission line, RF MEMS change



## **EXPERIMENT AND FEM ANALYSIS OF SILICA NANOPARTICLE- BASED IMPEDANCE IMMUNOSENSOR FOR SENSITIVITY ENHANCEMENT**

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### **Abstract:**

This article investigates the have an effect on of incorporating silica nanoparticles of various diameters in label free impedance immunosensor. It has been found that even if the floor region enchancement has been adjusted to be comparable for all the diameters, the sensitivity is more desirable by using 5 instances at a unique diameter of a hundred nm due to the most efficient aggregate of intersection with electric powered area traces and floor convexity. This learn about has enabled the detection of 0.1 fM Hep-B floor antigen with a dependable sensitivity of round 75%. Further, it has been located that the SNR corresponding to 0.1 fM is 20 dB only for one hundred nm particle. This SNR is similar to a latest document on Hep-B virus detection but the restriction of detection in the proposed sensor is decreased by using greater than three orders of magnitude.

Keywords: Nanopores, single molecule, sensing, algorithm, electronic interface.



## A HYBRIDIZED MODEL FOR THE PREDICTION OF HEART DISEASE USING ML ALGORITHMS

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### **Abstract:**

Heart disorder is a persistent sickness that can have an effect on the circulatory device of the body. It can motive a range of sorts of issues such as coronary heart failure and stroke. Machine studying is a promising technological know-how for figuring out humans with coronary heart disease. Precise and exactness in coronary heart sickness prognosis is taking part in vital position for the restraint and remedy of coronary heart failure. Through the traditional way of analysing coronary heart disease, the therapeutic file has judged which isn't constant in severa characteristics. Further, the classification of healthy, contaminated people, a non-invasive-based processes that consist of synthetic brain (AI) and desktop getting to know (ML) strategies which obey reliability and environment friendly outcomes. A machine-learning-based evaluation strategy for coronary heart disorder prediction is proposed in this learn about using coronary heart sickness dataset. Moreover, the proposed gadget can without problems distinguish in addition to categorize persons with coronary heart disorder as of wholesome persons. In this study, dataset of Cleveland coronary heart sickness with ECG photographs for the improvement of hybridised mannequin and then extracting vital points the usage of Genetic Algorithm and PSO algorithm and previously pertaining neural community algorithm to build prediction mannequin and then prediction mannequin will be utilized on take a look at records to calculate metrics like prediction accuracy. Subsequently, the proposed computing device learning-based methodology beneath the procedure of selection help put into effect resource the scientific practitioner to efficiently analysis the heart patients.

**Keywords:** Heart Disease, Machine Learning, Artificial Neural Network



## SURVEILLANCE AND OBSTACLE AVOIDING AUTONOMOUS ROBOT

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### **Abstract:**

This paper provides a wonderful work and deployment of cell automation that has lush options. Surveillance robots are now a days used in all places for quite a number of functions such as homes, offices, industries, energy flora etc., they are very beneficial in which these robots are beneficial in monitoring the locations or environment the place human intervention is now not allowed. Also, Obstacles avoiding, as in the identify itself these robots are used for heading off any barriers in the preferred function the place the robotic is roaming. This proposed Surveillance and Obstacle averting Robot makes use of the WEBOTS. This paper gives the format of a self-sustaining robotic as a primary improvement of a smart miniature and easy basic robotic which has simply made of two or three shapes. In this paper, we tend to advocate a graph for sensible work automation it is capable to keep away from obstacles. These kinds of robots are used in the functions like patrolling robotic the place it is used in industries each for surveillance and impediment avoidance.

**Keywords:** Surveillance, Obstacle avoidance, UAV, Reliability, Mobile Robot



## QUANTITATIVE EVALUATION OF DIFFERENT THRESHOLDING METHODS USING AUTOMATIC REFERENCE IMAGE CREATION VIA PCA

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### Abstract

This article proposes a fundamental issue analysis-based automated method to generate reference photo for evaluating one of a kind thresholding techniques. Twenty-one thresholding techniques have been viewed for reference photo introduction and evaluated the use of 5 popular overall performance indices. Literature suggests a few overall performance measures, amongst which F-measure, modified Hausdorff distance, side mismatch error, relative place error and object degree consistency error are popular. However, correlation evaluation of these metrics divulges that solely F-measure, modified Hausdorff distance and side mismatch error maintain non-redundant information. Thus, the fine thresholding technique can be decided from these three indices for specific sorts of images, automatically. Experimental effects reveal the conceivable of distinct thresholding techniques and choose the great binary segmentation approach for specific kind of photograph set.

**KEYWORDS:** Edge mismatch error; F-measure; modified Hausdorff distance; object level consistency error; principal component analysis; relative area error



## SHAPE AND TEXTURE FEATURES EXTRACTION USING SEGMENTED HISTOPATHOLOGICAL IMAGES

U. Rajyalakshmi, K. Satya Prasad & S. Koteswara Rao

### **Abstract**

For women, breast most cancers occupies the 2d role in inflicting the prevalence as nicely as mortality. Optimum segmentation and function extraction play a quintessential position whilst categorizing scientific images. The proposed paper integrates marker-based watershed method with K-means clustering information for most suitable segmentation. It offers with element thing protection. The work center of attention on characteristic extraction from the segmented histopathological images. Feature determination is imperative for minimizing the redundant parameters. Optimum points fundamental for picture categorization have been evaluated. The proposed work affords excessive accuracy during photograph classification.

**Keywords:** Breast most cancers histopathological images, K-means clustering, Marker managed, watershed, Feature extraction



## APPLICATION OF SIGMA POINT PARTICLE FILTER METHOD FOR PASSIVE STATE ESTIMATION IN UNDERWATER

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### Abstract

Bearings-only monitoring (BOT) performs a indispensable position in underwater surveillance. In BOT, size is tangentially associated to kingdom of the system. This size is additionally corrupted with noise due to turbulent underwater environment. Hence country estimation procedure the use of BOT will become nonlinear. This necessitates the use of nonlinear filtering algorithms in region of regular linear filters like Kalman filter. In general, these nonlinear filters make use of the assumption of measurements being corrupted with Gaussian noise for country estimation. The measurements can't be constantly corrupted with Gaussian noise due to the fact of the relatively unstable sea environment. These issues point out the necessity for improvement of nonlinear non-Gaussian filters like particle filter (PF) for underwater tracking. However, PF suffers from extreme issues like pattern degeneracy and impoverishment and additionally it is tedious to choose an splendid method for resampling. To overcome these difficulties in PF implementation, the method of combining PF with any other filter like unscented Kalman filter is proposed for target's country estimation. The distinctive evaluation of the equal is introduced in contrast with different particle filter combos the usage of the simulation consequences acquired in Matlab.

**Keywords:** Bearings-only tracking; Unscented Kalman filter; Particle filter; State estimation



## ACCEPTANCE CRITERIA OF BEARINGS-ONLY PASSIVE TARGET TRACKING SOLUTION S.

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### Abstract

In passive goal tracking, goal movement parameters (TMP) i.e. range, course, and pace are estimated the usage of bearing measurements. In the simulation mode, the accuracy of the estimated answer can be calculated, as genuine values are available. In the authentic scenario, the actual values of TMP are now not effortlessly obtainable. In this research, the focal point is laid on the evolution of the acceptance criterion of the TMP in the proper scenario. Detailed mathematical modeling is carried out and an unscented Kalman filter (UKF) is used to estimate TMP. The country vector covariance matrix of UKF is utilized to categorical the blunders in estimated TMP and an acceptance criterion is derived in phrases of the preferred deviation of mistakes in estimated TMP. Submarine to submarine monitoring is carried out and eventualities are chosen accordingly. Several low attitude on goal bow (ATB) situations are used in the Monte-Carlo simulation and the consequences are presented. A comparable process can be carried out for medium and excessive ATB situations and a submarine to ship or vice-versa passive goal tracking.

**KEYWORDS:** Non-linear systems; Optimal filtering; Sonar; Statistical signal processing; Target tracking



EXECUTING CNN-LSTM ALGORITHM FOR RECOGNIZABLE PROOF  
OF CERVICAL SPONDYLOSIS INFECTION ON SPINAL CORD MRI  
IMAGE: MACHINE LEARNING IMAGE

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**Abstract**

Various estimating mechanisms are current for evaluating the regional agony, neck torment, neurologic deficiencies of the sphincters at the stage midlevel of cervical spondylosis. It is imperative for the cervical spondylosis that the survey necessitates extensive vary of mastering capabilities about the systemized life, experience, and potential of the information for studying the capability, lifestyles system, and experience. Doctors take a look at the evaluation of state of affairs thru MRI and CT scan, however extra fascinating data have been observed in the bodily test. For this, a programming strategy is no longer available. The authors thereby advocate a novel framework that therefore inspects and investigates the cervical spondylosis using computation of CNN-LSTM. Machine mastering strategies such as lengthy non permanent reminiscence (LSTM) in fusion with convolution neural networks (CNNs), a variety of neural community (NN), are utilized to this approach to consider for making the systematization in quite a number applications.



## **THE CATEGORIZATION OF ARTIFICIAL INTELLIGENCE (AI) BASED ON THE AUTONOMOUS VEHICLES AND ITS OTHER APPLICATIONS**

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### **Abstract**

The synthetic talent (AI) is growing the terrific influences and revolution in the technological world, schooling world, enterprise world, and enterprise world. The standards in synthetic brain are enhancing themselves day with the aid of day, and it is turning into a section of human's day-to-day activities. It performs a fundamental position in the human life, and the scenario

will become the humans can't stay besides this AI. In this e book chapter, the categorization of synthetic talent based totally on the self-sufficient automobiles and its different functions is to be mentioned in brief. The synthetic Genius method is based totally on the synthetic neural community (ANN), laptop studying (ML), deep neural community (DNN), recurrent neural community (RNN), and convolution neural community (CNN). To put into effect these kinds of neural network, the gadget have to use the programming languages like MATLAB programming, Python programming, R programming, etc.

Keywords: Artificial talent (AI), Internet of matters (IoT), Artificial neural community (ANN), Machine getting to know (ML), Deep neural community (DNN), Recurrent neural community (RNN), Convolution neural community (CNN), Autonomous cars



## LANE DETECTOR FOR DRIVER ASSISTANCE SYSTEMS

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### Abstract

The difficult issue in the rush hour gridlock framework is path recognition. This Path recognition which draws in the PC vision local area's consideration. For PC vision and AI procedures, the Path location which goes about as the multi-include identification issue. Many AI procedures are utilized for path identification. Driver emotionally supportive network is quite possibly of the main component in the advanced vehicles to guarantee the wellbeing of the driver and decline the vehicle mishaps on street. Street Path identification is the most difficult errand and complex undertakings now-a-days. Street confinement and relative situation among vehicle and streets which likewise incorporates with this. In any case, in this diary, we propose another strategy. Here, an on-board camera to be utilized which is looking outwards are introduced here in this work. This proposed method which can be utilized for a wide range of streets like painted, unpainted, bended, straight streets and so on in various weather patterns. No requirement for camera adjustment and coordination of the change, might be any changing light circumstance, shadow impacts, different street types. No portrayal for speed limits. This incorporates that the framework obtains the front view utilizing a camera mounted on the vehicles and recognize the Path by applying the code from the Python Programming process. This proposed framework requires no more data about streets. This framework which shows a vigorous presentation for Path location.

**Keywords:** ADAS; Computer vision; Driver support system; ITS; Lane detection; Machine learning techniques; Python programming



## PERFORMANCE OPTIMISATION within DEVICE LAYER of IOT NETWORKS

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### Abstract

The exhibition of IoT networks incredibly changes while various systems administration geographies are utilized inside various layers of the IoT organization. The exhibition of the Gadget layer is subject to how the gadgets are associated, the group head is chosen using a suitable bunching calculation, the degree of the presence of heterogeneity among correspondence conventions, the degree of adaptation to non-critical failure, life span of the gadgets oversee through power the executives, and so on. A model is introduced that executes a Changed Low energy versatile grouping hierarchy (LEACH) Calculation that joins bunch head determination system, Power Minimisation, dealing with heterogeneity, and guaranteeing a serious level of adaptation to internal failure. The model is executed on a model and found to perform 15% more than different techniques utilized for carrying out Grouping inside the gadget level. © School of Designing, Taylor's University.

**Keywords:** Clustering device; IoT networks; Networking devices; Performance optimisation



## DESIGN OF 32-BIT CELL-BASED CARRY-SAVE COMBINATIONAL MULTIPLIER WITH REDUCED AREA AND PROPAGATION DELAY

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### Abstract

In Exceptionally Enormous Scope Coordinated (VLSI) and Computerized Signal Handling (DSP) applications, an Ordinary Combinational Multiplier utilizes a ton of equipment and engendering postponement, and that is one of the main pressing concerns. The still up in the air by the wave conveys between the adders. Most methods utilized in the combinational multiplier rely upon the paper-and-pencil shift-and-add (PPSA) calculation, which utilizations swell convey viper engineering. This paper proposes an engineering called Cell-based Convey Save Combinational Multiplier (CCCM) that spotlights on the spread postponement and region. Each line addresses a convey save snake. The convey yields are passed to the following line. For approving the proposed design, 16x16 duplication is performed and the general improvement in the postponement is 73.32 % while there is a 3.31 % decrease nearby. © Distributed under permit by IOP Distributing Ltd.

Keywords: carry-save; Multiplier; paper-and-pencil shift-and-add algorithm; propagation delay; ripple carry



## MACHINE LEARNING BASED DEEP JOB EXPLORATION AND SECURE TRANSACTIONS IN VIRTUAL PRIVATE CLOUD SYSTEMS

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### Abstract

Virtual Confidential Cloud (VPC) is an arising cloud climate used to give safer information correspondence. VPC gives genuine correspondence channel to get correspondence between the cloud members. The cloud occupations and the depiction of the runtime cloud occasions should be assessed to give faultless VPC administration. In spite of the fact that VPC gives security in network administrations, it must be enhanced with inward and outer stage level security highlights. In such manner, secure work administration plans guarantee end of assaults, unapproved occupations, ill-advised gets to and interruptions in VPC. MLSCS applies powerful procedures for taking out superfluous cloud responsibilities to decrease the scheduler intricacy and processor usage. In this work, superfluous positions are considered as the positions that are not proper for specific VPC planning arrangements and security standards (assaults Subsequently, the real positions are safely sent in to work scheduler through multi-server lines. In the trial arrangement, the proposed MLSCS is contrasted and existing plans, for example, Support Learning Based Appropriated Heterogeneous Adjusting procedure (RLDH), Feline Multitude Enhancement Based Occupation Overhauling strategy (CSOS) and Fluffy Based Security-Driven Overhauling method (FSDS). The outcomes show the MLSCS conveys 5% to 8% ideal outcomes than existing plans.

**Keywords:** Cloud system; Job transactions; Machine learning and job analysis; Security; Zero-trust environment



## SECURE OPPORTUNISTIC WATCHDOG PRODUCTION IN WIRELESS SENSOR NETWORKS: A REVIEW

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### Abstract

Finding the security weaknesses and settling the issues in Remote Sensor Organizations (WSN) are compulsory errands for giving secure information transmission. Aggressors or gatecrashers are ascending with different kinds of organization hurting exercises. Because of the open common mode of WSN, the administrations can be handily broken. Interruption Recognition Framework (IDS) assists with keeping the organization secure against the aggressors. Simultaneously, it isn't adequate against various ongoing aggressors. There are a lot of assaults are infused in remote transmissions. Thus, taking a profound review and finding the requirements in security point of view are vital positions. This study article examinations the issues and arrangements given on secure directing and fruitful guard dog creation in WSN. In such manner, this work examinations different proactive and responsive steering conventions, light weight cryptography procedures and assault types. From the examination, this profound overview proposes the ideal utilization of secure steering conventions and equipment effective security calculations. This review stretches out its commitment to uncover the versatility of productive cryptography strategies, assaults location calculations and conventions with ongoing guard dogs. This work fundamentally contributes for guard dog based interruption discovery in low fueled WSN. The presentation examinations and the outcomes given in this work convey the general specialized advantages and constraints of different strategies.

**Keywords:** Attackers; Intrusion; Secure routing; Watchdog and key management techniques; Wireless sensor networks



## **SURFACE MODIFIED CHITOSAN WITH CADMIUM SULFIDE QUANTUM DOTS AS LUMINESCENT PROBE FOR DETECTION OF SILVER IONS**

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### **Abstract**

In present work, the surface altered cadmium sulfide quantum spots (Albums QDs) was orchestrated with chitosan for the discovery of silver particles. Chitosan was utilized as network medium to create Albums QDs, bringing about the arrangement of novel QDs/chitosan composite. The Compact discs quantum dabs surface covered with chitosan were dissected utilizing UV-vis spectrophotometer, X-beam diffraction and transmission electron magnifying lens. The chitosan + Compact discs QDs showed high watery solvency with better relentlessness. By utilizing chitosan + Compact discs, the silver particles were recognized as well as decreased to nanosize because of the diminishing property of chitosan. The system of fluorescence extinguishing of chitosan + Discs by Ag<sup>+</sup> was explored utilizing photoluminescence spectroscopy.

**Keywords:** CdS quantum dots; Chitosan; Metal ion detection; Quenching mechanism



## DESIGN OF MICROPUMP WITH TWO STACKED RING TYPE PIEZOELECTRIC ACTUATORS FOR DRUG DELIVERY

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<sup>b</sup>Department of Physics, National Institute of Technology, Kurukshetra, India

### Abstract

The Micropump has numerous applications in the field of microfluidics frameworks where it needs to deal with a tiny volume of liquids in a controlled way. Applications incorporate medication conveyance and medical care frameworks (Checking and indicative), microelectronic cooling gadgets, and some more. The fundamental goal of this paper is to plan a micropump for drug conveyance applications with two Stacked ring type piezoelectric actuators (SPZT) for having a superior stream rate with a low working voltage of 90 VP-P. The Utilization of ring type actuator diminishes the area of contact among actuator and film which must be stuck. A review is performed on layer uprooting by shifting the inward span of ring type SPZT actuator. The Actuator utilized here is the Stacked (multifaceted) type which offers more endure low voltages. Everything parametric review is performed utilizing FEM mathematical investigation. The proposed micropump configuration given a stream pace of 800( $\mu$ l/min) at an activity recurrence of 100 Hz.

**Keywords:** Drug delivery system; Ring type PZT actuator; Stacked PZT actuator



## ASSESSMENT OF IRI-2016 HMF2 MODEL PREDICTIONS WITH COSMIC OBSERVATIONS OVER THE AFRICAN REGION

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### Abstract

With significant advancement in the climatological nature of the International Reference Ionosphere (IRI) through a series of editions, the ionospheric community now focuses on possible improvements in the IRI Real-Time Assimilative Model (IRTAM) for describing the real-time weather conditions in the ionosphere. In line with the focuses of the global research community, the present study intends improving the critical ionospheric electron density height (hmF2) predictions in the latest version of the IRI model (IRI-2016) through a comparative analysis with the hmF2 derived from the Constellation Observing System for Meteorology, Ionosphere and Climate (COSMIC) ionospheric occultation profiles over the African region under various solar and geomagnetic conditions. The SHU-2015 model option in IRI-2016 manifests the least prediction error, best model efficiency, and correlation with the COSMIC hmF2 values, justifying the use of a large number of COSMIC profiles in the development of the SHU-2015 model. Finally, the study suggests the suitability of the SHU-2015 IRI hmF2 option over the African region when and where there are no or limited COSMIC profiles. Additionally, the research work suggests further improvements in the IRI hmF2 predictions, especially for night-time values over the African region.

**Keywords:** African Ionosphere; COSMIC; hmF2; IRI-2016; Radio occultation



## COMPARISON BETWEEN SWARM MEASURED AND IRI-2016, IRI-PLAS 2017 MODELED ELECTRON DENSITY OVER LOW AND MID LATITUDE REGION

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### Abstract

In the current paper, we examine the electron thickness perceptions from the Langmuir tests (LPs) locally available low Earth circling (LEO) Multitude satellites. To complement its employability in model enhancements, we thought about the separated F2 locale basic electron thickness (foF2) and its comparing height (hmF2) with the Digisonde perceptions and IRI-Plas 2017 model assessments at eight overall Digisonde areas during the year 2020. We endeavored to imagine the error in greatness between Multitude perception and IRI-Plas 2017 by free recreation and afterward alternatively ingesting the Digisonde foF2 and hmF2 boundaries into the model. The outcomes show that Ne from Multitude An and Multitude B is higher than IRI-2016 assessments during the evening with the proportion going from 1 to 5 though during the daytime the proportion stays 0 to 1. This affirms that Multitude Ne perceptions have altogether higher qualities during evening time over worldwide district, supporting further investigations on the flooded evening factors. It has been additionally seen that there is no latitudinal discrepancy among Multitude and IRI-Plas 2017 displayed or IRI-2016 demonstrated perceptions.

**Keywords:** Digisonde; Electron density; IRI-2016 model; IRI-Plas 2017 model; Swarm mission



## CONCENTRIC RING STRUCTURED RECONFIGURABLE ANTENNA USING MEMS SWITCHES FOR WIRELESS COMMUNICATION APPLICATIONS

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### Abstract

This paper proposes a reconfigurable round microstrip receiving wire to serve the remote correspondence applications that make use recurrence groups like ISM (Modern Logical and Clinical), WLAN (Remote Neighborhood), UMTS (General Portable Broadcast communications Administration). Reconfigurability is accomplished with the assistance of four MEMS (Miniature Electro-Mechanical Frameworks) changes to change the recurrence and radiation properties of the radio wire. By picking both of the two conditions of every one of the MEMS switches, the range of the roundabout fix is differed and accordingly the working resounding recurrence. This brings about various arrangements of the receiving wire to serve for various remote applications. Surrendered Ground Construction is utilized in this plan to bring down the resounding recurrence and work on the data transmission. Concentric rings are carried out alongside a center round fix to build the emanating region of the fix in relationship with the MEMS-based changes to work in switch method of ON and OFF. The concentric rings likewise helping in acquiring double recurrence conduct of the receiving wire and the deliberate outcomes are showing great concurrence with the reproduction results.

**Keywords:** Concentric ring; MEMS switches; Reconfigurability; Wireless communication



**DESIGN AND ANALYSIS OF A CAPACITIVE MEMS  
ACCELEROMETER AS A WEARABLE SENSOR IN IDENTIFYING  
LOW-FREQUENCY VIBRATION PROFILES**

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**Abstract**

The presented MEMS Sensor uses Accelerometer technology to capture human motion and vibration data helping in clinical diagnosis and medical monitoring. The chapter elucidates upon analyzing the response of a Proof mass on changing different parameters in the process of designing a capacitive accelerometer for Human motion Monitoring. Modelling the structures of different proofmass and varying the geometric structure and measurements yields in different values of Effective Spring Constant which in turn impacts operating frequency. Judicious selection of the design parameters and their optimization plays a crucial role in modelling a Proof mass whose resonant frequency is the function of parameters identified thereby. The Proof mass responds to low-frequency inputs less than 10 Hz and has fixed bandwidth of (2–8) Hz. The proofmass could be used as the sensing element in a wearable sensor that diagnoses Parkinson's disease in early stages.

**Keywords:** Accelerometer; MEMS; Parkinson's disease; Point of care diagnostic testing; Wearable sensor



## DESIGN OF ELLIPTICAL-SHAPED RECONFIGURABLE PATCH ANTENNA WITH SHUNT CAPACITIVE RF-MEMS SWITCH FOR SATELLITE APPLICATIONS

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### Abstract

In this paper, non-uniform wandered line shunt capacitive RF-MEMS switch is introduced at a curved fix scratched with a split-ring resonator (SRR) for satellite correspondence applications. The non-uniform wander line shunt capacitive is a fixed sort of RF-MEMS switch that is presented in this model receiving wire. The proposed receiving wire configuration is reverberated at 10.46 GHz with the return deficiency of-37.6 dB. The presentation advancement of the proposed radio wire configuration is assessed with and without incorporated RF-MEMS switch on the proposed radio wire SRR. It is seen that the proposed model at the ON-state switch reverberates at 10.57 GHz recurrence with the return deficiency of-30 dB. Also, at the OFF-state switch, it reverberates at 10.53 GHz recurrence with the return deficiency of-43 dB. Al<sub>3</sub>N<sub>4</sub> (aluminum nitride) is utilized for the switch as a dielectric material, subsequently the switch accomplishes higher detachment. The incitation voltage of 7.9 V is expected for the change to activate from ON to OFF state. The switch achieves least addition and return misfortune which is talked about in additional segments. The proposed receiving wire is manufactured and tried by a vector network analyzer; there is a decent understanding between the reenacted and estimated results.

**Keywords:** CSRR; microstrip patch antenna; reconfigurable; resonance frequency; return loss



## IMPROVEMENT OF WIDER BANDWIDTH USING DUAL E-SHAPED ANTENNA FOR WIRELESS COMMUNICATIONS IN 5G APPLICATIONS

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### Abstract

In this paper a double E-molded fix (ESP) radio wire is proposed to improve the more extensive impedance transmission capacity to be use for remote correspondences in 5G applications. The proposed double ESP recieving wire execution examination is done with stub in this work. The proposed ESP recieving wire with stub accomplishing reflection coefficient underneath - 10 dB for got various thunderous groups. The double ESP recieving wire works at 5.7 GHz,10.1 GHz,15.1 GHz,19.4 GHz and 22.4 GHz get reflection coefficient of -44.32 dB, -27.43 dB, -17.0 dB, -50.85 dB and -18.07 dB individually. The proposed recieving wire with stub accomplishes impedance data transmission of (4.28 GHz-24.06 GHz) with 139.37% improvement reverberate at 19.77 GHz working recurrence. The radiation designs, current dispersions and gain plots are seen at five full groups. The mimicked results are coordinated well with the deliberate outcomes.

**Keywords:** E-shaped patch antenna; Rectangular stub; Wireless applications



## A REAL AND ACCURATE DIABETES DETECTION USING VOTING-BASED MACHINE LEARNING APPROACH

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### Abstract

Diabetes is a dangerous infection that happens when the pancreas cannot generate insulin or the body could not utilize the insulin appropriately. The pancreas produces a type of hormone named as Insulin. A wide range of food which we eat is additionally separated into glucose. Insulin causes us to get into the human cells and helps us to generate energy. Type-2 is most commonly seen in adults and 90% of all diabetes cases are type-2; in type-2, your body does not use insulin properly which it produced. An oral drug and insulin are required to manage blood glucose levels. GDM is one of the type of diabetes which consists of high glucose level during pregnancy and the good part of this is mostly it disappears after pregnancy, if not their children may affect with type-2 in the later stage of their age. 1 among 10 persons is living with these three types of diabetics worldwide so we developed a machine learning classification model to identify the person is affected or not with the highest test accuracy. The machine learning models which we used are logistic regression, linear SVM, K-NN, random forest classifier, GBDT, SVC, and we also used hyperparameter tuning to get the best accuracy from these six respective models. The main aim of this project is to identify the three best machine learning models out of six with highest accuracy and apply the voting classifier by using this, we had acquired 96% of train accuracy and 88% test accuracy.

**Keywords:** Hyperparameter tuning; ML classification models; Performance metrics; Voting classifier



## MRI BRAIN IMAGE SEGMENTATION BY USING A DEEP SPECTRUM IMAGE TRANSLATION NETWORK

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### Abstract

Presently a days clinical picture handling is testing task. In view of its design, adaptability set up, and unpredictable lines, manual ID and division of mind cancers is troublesome. The proposed work utilizes the super pixel procedure to recognize and section cerebrum cancers in light of move learning. This cycle is called as thick expectation since we are anticipating for every pixel in the picture. It is vital to distinguish these cancers right on time to give better therapy to patients. Early discovery works on the patient's possibilities of endurance. The essential objective of this study is to involve profound figuring out how to fragment mind cancers in X-ray pictures. The recommended procedure is tried utilizing information from Kaggle informational indexes for Mind Cancer Division. In the initial step we are pre-handling the necessary informational indexes, in the wake of getting required way we are applying the information to VGG-19 exchange learning organization to distinguish the issue of the cerebrum growths. And afterward we are utilizing UNet model for growth location process. Because of these cycles, we are getting better improvement with regards to quality measurements.

**Keywords:** Magnetic resonance images; Segmentation; Transfer learning; Vgg-19 network



ANN-based liquid level transmitter using force resistive sensor for minimisation  
of hysteresis and non-linearity error

Anamika Lata , Nirupama Mandal

Abstract:

The proposed liquid stage transmitter the usage of a pressure resistive sensor as a secondary sensor is simple, cost-effective, and relevant for all styles of liquid. The pressure resistive sensor is placed at the lowest of a liquid measuring tank. The pressure exerted via way of means of the liquid peak at the measuring tank adjustments the pressure resistive sensor's resistance. In the long time application, because of the creeping behaviour of pressure resistive sensor, the proposed stage transmitter has low repeatability, hysteresis, and nonlinearity. In this study, the synthetic neural network (ANN) has been used to remove the hysteresis and non-linearity gift in the proposed liquid stage transmitter. The overall performance of the proposed approach has been experimentally verified. The hysteresis and non-linearity mistakes has been reduced from 7 to 0.89% of full-scale observation (FSO) and nine to 0.14%, respectively.



## Multifunctional Electrode Polarization Impedance-Based Sensor for Calculating Flow Rate and Conductivity of Fluid

Anamika Lata , Ishita Bhar , and Nirupama Mandal , Senior Member, IEEE

### Abstract

Flow fee size of conductive fluid is vital in lots of applications, which includes oil, chemical, ocean engineering, and fueloline industries. In this work, we've got proposed a simple, cost-effective, dependable glide sensor for figuring out conductive liquid glide throughout the glide loop. This proposed sensor makes use of the electrochemical precept this is the variant of polarization impedance of electrodes whilst immersed in a fluid with the glide of fluid throughout the glide loop as a measuring parameter for glide fee calculation. The identical proposed sensor can decide each the glide fee in addition to the conductivity of the liquid. The experiment has been completed and proven the use of finite detail method (FEM) software program COMSOL. The experimental traits are found to observe the theoretically derived relation, and it's also unfastened from the temperature effect. The designed device is an economical and simple approach for real-international applications. The proposed measuring device has correct repeatability, sensitivity, and coffee hysteresis error. The theoretically and experimentally derived outcomes are defined on this article.

Keywords: Conductive liquid, conductivity, electrode polarization impedance, flow rate, repeatability, temperature, voltage



## TRAFFIC MONITORING IN SMART CITIES USING INTERNET OF THINGS ASSISTED ROBOTICS

Muruganantham Ponnusamy , Aravindhana Alagarsamy

### Abstract:

In current era, IoT-assisted robotics (IoRT) performs a prime component in participating IoT sensor nodes, robots and humans to set up a collaborative communication. In this paper, we expand an IoRT device with a present day structure that encompasses the combination of IoT sensor nodes and robots in clever towns. The examine develops a cloud platform to get entry to clever automobile mobility facts in clever towns with out collision. A framework is then evolved to help the robots and IoT sensor node in handling and making short selections on visitors collision. Hence, it's miles evolved to connect, share, and trade the information among the cloud and the IoT nodes/robots. The experimental validation indicates progressed visitors control and collision unfastened visitors in clever towns than different clever town visitors control mechanism.

Keywords: IoRT Internet of things Robots Cloud platform



## **CANAL TOP SOLAR PANELS: A UNIQUE NEXUS OF ENERGY, WATER, AND LAND**

IP.M.N. Sairam A Aravindhhan

### Abstract:

The calamity of strength elevated over the many years because of populace increase, factories, and industries maximum of the strength comes from the thermal electricity plants. Renewable strength reassets are the best or proper strength answer for fossil fuels. Renewable strength reassets are diverse kinds however sun electricity performs an vital function in renewable strength reassets due to its availability, smooth safe, and pollution-loose nature. The constructing of a sun electricity gadget takes very massive regions of land. By the usage of the canals pinnacle sun electricity plant gadget reduces the requirement of a huge region of land and reduces the water evaporation through sunlight. The price of sun strength is lowering very fast. Solar Thermal Electricity (STE) and Solar Photovoltaic Electricity (SPVE) have become aggressive in opposition to traditional strength. To triumph over the issues the modern concept is available in the front for putting in sun electricity plant gadget on canal tops the usage of an inter-array spacing of sun panels this reduces the evaporation of water via the inter-array spacing and will increase the radiation at the sun panel in order that the electricity output of gadget additionally will increase on this paper specially makes a speciality of canals pinnacle sun electricity gadget with the layout of reflectors and with out reflectors and evaluating the performance and price of each structures and presenting which gadget is maximum idle for sun electricity plant installation.

### Keywords

Renewable energy ,Canal top solar system,Photovoltaic ,Solar thermal electricity (STE), Solar photovoltaic electricity (SPVE) ,Conventional energy



## COMPUTATIONALLY DECODING NUDF RESIDUES TO ENHANCE THE YIELD OF THE DXP PATHWAY

Devi Prasanna Ashish Runthala

### Abstract:

Terpenoids shape a huge pool of surprisingly various organic compounds owning numerous economically vital properties, along with nutritional, aromatic, and pharmacological properties. The 1-deoxy-D-xylulose 5-phosphate (DXP) pathway's stop enzyme, nuclear distribution protein (NudF), interacting with isopentenyl pyrophosphate (IPP) and dimethylallyl pyrophosphate (DMAPP), is crucial for the synthesis of isoprenol/prenol/downstream compounds. The enzyme is but to be very well investigated to boom the general yield of terpenoids withinside the *Bacillus subtilis*, that's broadly used in enterprise and is commonly appeared as a safe (GRAS) bacterium. The look at ambitions to investigate the evolutionary conservation throughout the active web website online for mapping the important thing residues for mutagenesis studies. The 37- collection information set, extracted from 103 *Bacillus subtilis* entries, indicates a excessive phylogenetic divergence, and most effective six one-motif sequences ASB92783.1, ASB69297.1, ASB56714.1, AOR97677.1, AOL97023.1, and OAZ71765.1 display a monophyly courting, not like a entire polyphyly courting among the alternative 31 three-motif sequences. Furthermore, most effective forty seven of 179 residues of the consultant collection CUB50584.1 are found to be extensively conserved. Docking evaluation shows a preferential bias of adenosine diphosphate (ADP)-ribose pyrophosphatase closer to IPP, and a almost threefold active distinction is found among IPP and DMAPP. The loops are hereby proven to play a regulatory function in guiding the promiscuity of NudF closer to a selected ligand. Computational saturation mutagenesis of the seven hotspot residues identifies key positions LYS78 and PHE116, orderly encoded inside loop1 and loop7, majorly interacting with the ligands DMAPP and IPP, and their mutants K78I/K78L and PHE116D/PHE116E are located to stabilize the general conformation. Molecular dynamics evaluation indicates that the IPP complicated is extensively extra strong than the DMAPP complicated, and the NudF shape could be very unstable. Besides displaying a promiscuous binding of NudF with ligands, the evaluation shows its rate-restricting nature. The look at might permit us to customise the metabolic load closer to the synthesis of any of the downstream molecules.



## COMPARATIVE DEVICE PERFORMANCE OF CZTS SOLAR CELL WITH ALTERNATIVE BACK CONTACT

Atul Kumar, Ngangbam PhalguniSingh Arunmetha Sundaramoorthy

### Abstract

In this have a look at we document the comparative have a look at of CZTS/CdS sun mobileular tool with one of a kind again contacts. The tool configuration of ITO/CZTS/CdS and Ni/CZTS/CdS are fabricated and characterized. By various the again-touch paintings characteristic of tool the overall performance of the sun mobileular tool is enhanced. A excessive paintings characteristic again touch may want to efficaciously make a near-ohmic touch with excessive bandgap p-kind semiconductor. We right here experimentally confirmed the development in tool performance through using excessive paintings characteristic again touch for CZTS tool. The comparative gadgets exhibited overall performance, with open-circuit voltage of 0.sixteen V and 0.36 V and conversion performance of 0.74% and 2.33% for ITO/CZTS/CdS and Ni/CZTS/CdS tool respectively. We numerically replicated this enhancement the use of paintings-characteristic as parameters in simulations.

Keywords: ContactsSolar energy materialsWork functionCZTS



## ICLM: EMPIRICAL EVALUATION OF RHEUMATOID ARTHRITIS DISORDER USING IMAGE CLASSIFICATION AND LINEAR MAPPING PRINCIPLES

Mohana Sundari L. Senthil Kumar T ,Nagarajan P. ,Rajendranath U.N.V.P.<sup>d</sup>.; Phalguni Singh,  
Ngangbam

### Abstract:

Deformity and evaluation can arise withinside the later levels of Rheumatoid Arthritis due to the fact joints are eroded like bones. Hand and wrist joints are maximum usually impacted withinside the early levels of this illness, making radio graphs of the arms crucial. Arthritis patients` hand X-ray virtual radio graphs have lately been used to assess JSW manually due to its inaccuracy and unpredictability throughout readers. In addition, radiologists have a difficult time reading hand radio graphs due to the fact there are 14 hand joints in all. Computer-aided evaluation is important to get rid of observer dependence. Image Classification and Linear Mapping Principles (ICLMP) the use of MATLAB can be used to analyze joint area narrowing, in line with our studies Active Form Model is used to outline bone limitations on this work, which incorporates a statistical version of the bone form and texture. Local linear mapping the use of textural traits identifies joint locations. We've analysed 5 RA-inflamed hand radio graphs. ninety two percentage of joint region estimates are accurate. The use of automatic evaluation lessens the call for for pretty skilled employees. In addition, far off analysis and remedy may be accomplished.

Keywords: Biomedical Image Processing; Digital Image Processing; DIP; Rheumatoid



## DESIGN AND ANALYSIS OF EBG ANTENNA FOR WI-FI, LTE, AND WLAN APPLICATIONS

Pronami Bora, P. Pardhasaradhi, and B. T. P. Madhav

### Abstract

A non-planar electromagnetic band gap (EBG) dependent antenna is proposed on this paper for wireless verbal exchange applications. The proposed layout consists of coplanar waveguide (CPW) fed rectangular patch antenna embedded with triangular EBG backing on FR-four substrate cloth for 2.4 GHz (Wi-Fi, LTE) and 5.2 GHz (WLAN) applications. Gain is progressed from 2.8 dB to 13.9 dB via way of means of including EBG shape withinside the proposed antenna and the parametric evaluation is completed for optimizing the antenna overall performance characteristics. The proposed antenna presents a most performance of 82.5% withinside the resonating frequencies. The prototyped antenna is having good correlation with the simulation effects acquired from Finite Element Method (FEM) primarily based totally on Ansys-HFSS. High Frequency Structure Simulator is used to investigate the antenna parameters and the simulated and measured effects are correlating properly with every different with a slight extrade in frequencies

**Keywords:** Coplanar waveguide, EBG, high frequency structure simulator, long term evolution, wireless fidelity, wireless LAN



## SMART REAL TIME HEALTH MONITORING SYSTEM USING ARDUINO AND RASPBERRY PI

PronamiBoraP. KanakarajaB. ChiranjeeviM. Jyothi Sri SaiA. Jeswanth

### Abstract

The not unusual place hassle we are facing in recent times is the shortage of correct fitness take care of the elderly. There are many home-primarily based totally fitness care tracking structures however they may be restricted because of diverse setbacks. This paintings proposes a layout of a fitness care tracking machine via way of means of the usage of Arduino and Raspberry PI, to monitor the parameters i.e., heartbeat, frame temperature, coronary heart rhythm, and electric activity. GPS module is used for monitoring the place and digital digicam for taking pictures stay feed and an alert notification machine that will notify the health facility and own circle of relatives if the values are extraordinary and we also can test the real-time facts in an app or a internet site this is included into this module.

Keywords: Internet of Things (IoT) Health monitoring system ECG GPS module Heartbeat.



## DESIGN AND IMPLEMENTATION OF SMART ENERGY METER USING LORA-WAN AND IOT APPLICATIONS

Kanakaraja P. Upadhyay, Sourabh; Kotamraju, Sarat K; Venkata Sai Suneela G.; Neelesh,  
Rudra

### Abstract

In the each day existence withinside the gift global wherein we're the use of big technology, strength is the maximum essential time period to deal for any Digital device to work, so it's miles as essential to calculate the strength we're eating for our desires as whatever over may also drain one, in an effort to understand the strength fed on from everywhere right here we're managing clever strength meter the use of LoRa-WAN and IoT Applications, LoRa stands for Long Range, the call itself states that it offers with lengthy variety conversation with the low strength intake running on batteries for years, In the IoT programs the variety of the conversation is the maximum essential factor, as in IoT maximum of the Wi-Fi primarily based totally structures desires to have many get right of entry to factors to cowl the massive region for this reason there's increment withinside the fees for the device to integrate, through including the unit of LoRa to the defined layout we are able to decorate the device to lengthy variety to numerous places inside that prescribed variety as a LoRa can cope with many nodes, the primary subject of the LoRa is to sell the Bi-directional conversation, all of the records accrued is saved withinside the Gateway and despatched to the cloud server wherein you may get right of entry to the records from everywhere thru the cell telecellsmartphone or PC and device, through putting in the traumatic model of software program to your Gadget. AS we are able to see that during our actual time we're the use of 4G community wherein transmitted bits or more, withinside the idea of LoRa the transmitted bits or less, through which we are able to triumph over the downside of the 4G/GSM networks, as of now as there's a large loss to the telecommunication industries because of this they're switching to the LoRa.

Author keywords: 4G; Gateway; LoRa 1278; Receiver Unit and NodeMCU; Transmitter Node; Ubidots IoT Platform; Wi-Fi



EXTRACTING BEHAVIOR IDENTIFICATION FEATURES FOR  
MONITORING AND MANAGING SPEECH-DEPENDENT SMART  
MENTAL ILLNESS HEALTHCARE SYSTEMS

Alka Londhe, P. V. R. D. Prasada Rao, Shrikant Upadhyay, **Rituraj Jain**

*Abstract*

Speech is one of the primary communication equipment to proportion facts amongst human beings. This change technique has a complex production which include now no longer the first-class presenting of voice however moreover which include the transmission of many-speaker particular facts. The maximum vital intention of this studies is to extract character capabilities thru the speech-structured fitness tracking and control gadget; thru this gadget, the speech information may be accumulated from a faraway region and may be accessed. The experimental evaluation indicates that the proposed version has an excellent efficiency. Consequently, withinside the closing 5 years, many researchers from this area are available the front to discover numerous components of speech which incorporates speech evaluation the usage of mechanical signs, human gadget interaction, speaker, and speech identification. Speech is a biometric that mixes physiological and behavioural characteristics. Especially useful for faraway assault transactions over telecommunication networks, the scientific facts of all and sundry is pretty a challenge, e.g., like COVID-19 in which the scientific group has to become aware of all and sundry in a specific vicinity that what number of human beings were given suffering from a few ailment and took a brief degree to get covered from such illnesses and what are the protection degree required. Presently, this venture is the maximum hard one for researchers. Therefore, speech-primarily based totally mechanisms is probably beneficial for monitoring his/her voice exceptional or throat getting affected. By accumulating the database of human beings matched and evaluating with his/her authentic database, it could be diagnosed in such scenarios. This presents the higher control gadget with out touching and keeps a secure distance information that may be collected and processed for similarly scientific treatment. Many studies research were executed however speech-structured technique is pretty much less and it calls for greater paintings to offer this sort of clever gadget in society, and it is able to be feasible to lessen the probabilities to return back into touch with viral effected human beings withinside the destiny and guard society for the same.



ASSESSMENT OF IONOSPHERIC VARIABILITY FROM IRI-2016, SPIM-  
2017, AND IGS-GIM USING DIGISONDE AND GPS OBSERVATIONS  
OVER CYPRUS

Sampad Kumar Pand· Kanaka Durga Reddy battul· Haris Haralambous· Sunil Kumar  
Sharma

Abstract

The gift take a look at specializes in ionospheric F-layer crucial parameters (foF2/hmF2) and Total Electron Content (TEC) with the aid of using exploiting a long-time period data (2009 to 2016) from Digisonde and Global Positioning System (GPS) receiver observations over a lower-center range European place Nicosia, Cyprus (geographic 35° N, 33° E; magnetic dip. 32° N). Also, it adheres to comparing the performances of world empirical trendy International Reference Ionosphere (IRI-2016), Standard Plasmasphere Ionosphere Model (SPIM-2017/IRI-Plas 2017), and interpolated TEC from the IGS-Global Ionospheric Maps (GIMs) with the aid of using evaluating with the Digisonde and GPS observations. Our consequences confirm a noteworthy departure of anticipated foF2/hmF2 and TEC in SPIM-2017, even large than that of IRI-2016 with reference to the Digisonde and GPS observations, irrespective of season, sun interest, and geomagnetic interest conditions. This contradicts the overall belief on a great conduct of the empirical climatological version over the center range location, inferring that the temporary location between the low and center range does be afflicted by important uncertainties. Also, we did now no longer be aware any convincing reaction of the typhoon sub-version in IRI besides a unprecedented flipping in its importance and really no alteration in SPIM version esti- mations to the onset of geomagnetic storms over the location notwithstanding the typhoon sub-version changed into kept `on`. This shows a revisit into the underlying typhoon sub-version database withinside the models. Interestingly, the ingestion of Digisonde recorded foF2/hmF2 and GPS-TEC into the SPIM-2017 version consequences in a amazing convergence of the parameters in the direction of the neighborhood observations even all through lively geomagnetic typhoon conditions. It ascertains the flexibility in SPIM-2017 to- wards manageable upgrades withinside the version estimations with the aid of using eating GPS-TEC.

Keywords IRI-2016 · SPIM/IRI-Plas 2017 · IGS-GIM · Digisonde · GP



## **NOVEL DEFENSE FRAMEWORK FOR CROSS-LAYER ATTACKS IN COGNITIVE RADIO NETWORKS**

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### Abstract

Cognitive radio networks are the self-configuring and specially resolve the trouble of spectrum usage. Cognitive radio networks continually try and discover Occupied or unoccupied channels for transmission. Cognitive radio networks (CRN`s) are an allowing generation for a couple of functions like dynamic spectrum access, spectrum sharing, and dynamic allocation. The present studies of protection troubles in CRN`s specially considers assaults in man or woman layers and gives enormous answers however attacker can't propagates his assaults in unmarried layer. In this work, we designed a cross-layer assault solution, wherein attackers assault exclusive layers at a time. The assaults we taken into consideration are document fake sensing data (RFSD) assault in bodily layer and small backoff window (SBW) assault in MAC layer. Simulation effects suggests that our proposed answers carry out in decreasing those assaults and appreciably lessen the assault opportunity and boom channel usage via way of means of number one users.

Keywords: Cognitive radios; Cross-layer attacks; Framework; Security; Trust fusion



## **RECENT PROGRESS IN SURFACE PLASMON RESONANCE BASED SENSORS: A COMPREHENSIVE REVIEW**

VasimallaYesudasu<sup>a</sup> Himansu ShekharPradhan<sup>a</sup> Rahul JasvanthbhaiPandya<sup>b</sup>

Abstract:

In the latest years, researchers have contributed appreciably within the area of Surface Plasmon Resonance (SPR) sensors and its applications. SPR sensors display the salient features, along with label-unfastened detection, real-time monitoring, small pattern size, provide correct effects at low cost, and easy handling. Moreover, the SPR sensors also are famous due to its quantitative and qualitative remarkable overall performance in real-time applications, which include drug discovery, surroundings monitoring, meals safety, scientific diagnosis, scientific diagnosis, organic studies, and biomolecule interactions. This paper famous a complete overview of SPR primarily based totally sensors, along with prism-primarily based totally SPR with the applications (e.g., biomolecule interaction, scientific diagnostic, etc.), fiber-primarily based totally SPR, and waveguide-primarily based totally SPR. Furthermore, we summarized the present day designs and strategies with their obstacles and demanding situations in detail. The erudition mentioned on this paper may be given an super gain for the researchers and enterprise humans within the area of SPR primarily based totally sensors.

Keywords: Detection accuracy, Fiber based surface plasmon resonance, Figure of merit ,Sensitivity , Surface plasmon resonance ,Quality factor



## **SPR PERFORMANCE ENHANCEMENT FOR DNA HYBRIDIZATION EMPLOYING BLACK PHOSPHORUS, SILVER, AND SILICON**

Yesudasu Vasimalla, Himansu Shekhar Pradhan, and Rahul Jashvantbhai Pandya

Abstract:

We gift the overall performance enhancement of the floor plasmon resonance (SPR) sensor for deoxyribonucleic acid (DNA) hybridization using black phosphorus (BP), silver (Ag), and silicon (Si) configurations and numerical analysis. The aggregate of Ag and BP demonstrates the sensitivity of  $91.54^\circ/\text{RIU}$  with degradation of detection accuracy (DA), nice factor (QF), and discern of merit (FOM). To decorate the DA, QF, and FOM, a unique SPR is proposed with Si, which demonstrates a DA and QF of sixty nine and  $1061.6\text{RIU}^{-1}$ , which might be 8.fifty three and 11.04 instances, and an FOM of 554.58, that is 4.forty seven and 5.seventy seven instances better than each the traditional and graphene-primarily based totally SPR sensors, respectively.



## T-FED FOR END-FIRE PATTERN OF LOG-PERIODIC MICROSTRIP ARRAY

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### Abstract

In this article, feeding methods for a log periodic microstrip antenna array are discussed (LPMA). For each feed arrangement, it suggests straightforward LPMA design equations. We apply a scaling factor of 0.05 for a 4 to 6 GHz operating band. The T-Fed LPMA offers a gain enhancement of 2 to 5 dBi over conventional designs, according to EM simulation studies and measurements taken on prototypes. The proposed configuration, in contrast to many other LPMA configurations, adheres to the correct Log-Periodic principle and virtually has an end-fire radiation pattern. These design guidelines will be helpful in LPMA synthesis, and prototype-based designs can be used in a variety of contexts, such as Wi-Fi, C band, and other sectors.

**KEYWORDS:** log periodic antenna, LPMA, microstrip antenna



## IOT BASED SMART ENERGY METER USING GSM

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### Abstract

Over the past century, the demand for electricity has grown dramatically. Reducing the amount of electricity used by families is one method for solving today's energy problems. The primary goal of the study is to suggest an alternative approach to the traditional one for predicting and billing energy consumption. The improvement of keen matrix (smart grid) advancements is necessary given the expansion of sustainable energy source commitment and the appropriated age. The proposed framework for a smart energy metre can work in conjunction with an installed regulator and a GSM module to send information such as consumed energy in KWh, produced charge, and security administrations over a GSM mobile network. It furthermore continuously reads the readings from the energy metre and sends a few updates, such as low-balance and zero-balance alerts to the enrolled number through GSM modem.

**Keywords:** Global System for Mobile Communication (GSM) Smart energy meter Arduino IDE Arduino (ATMega328) Development Board Proteus 8.0 Smart grid



## EARLY ESTIMATION MODEL FOR 3D–DISCRETE INDIAN SIGN LANGUAGE RECOGNITION USING GRAPH MATCHING

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### Abstract

A crucial task for computer vision is sign language machine translation. In this work, we suggest using graph matching for sign identification and 3D motion capture technologies for sign capture. There are two issues with 3D sign matching. In this study, two topics—(1) how to recognise the same signs with varying numbers of motion frames and (2) sign extraction from a jumble of non-sign hand motions—are covered. The 2D or 3D sign language machine translation is a difficult task as a result of these two issues. We suggest using a graph matching early estimation approach to tackle these issues in two stages. Intra graph matching is used in the first stage of motion frame extraction to keep motion-intensive frames from 3D films and databases. The second stage utilises early estimation model and inter graph matching on motion derived queries and dataset 3D movies. The suggested model accelerates the graph matching method by allowing it to estimate a sign in a smaller number of frames. We used 3D motion capture technology to record 350 syllables of Indian sign language to test the graph matching model. For testing, 5 distinct signers are used with the same hand speeds, slower hand speeds, and mixed, congested hand motions for 4 permutations of each sign. With the two induced real time restrictions, the early estimation graph matching model is evaluated for correctness and effectiveness in classifying 3D signs. The suggested approach is examined on five benchmark datasets in addition to the 3D sign language dataset and against the against contemporary graph matching techniques and datasets.

Keywords: 3D Motion Capture, 3D Sign Language, 3D Graph Matching, Pattern Classification, Spatial Graph Matching, Temporal Graph Matching



## DESIGN AND IMPLEMENTATION OF IOT BASED SMART STREETLIGHTS SYSTEMS

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### Abstract

The Internet sparked a revolution in the field of wireless technology and connection. The fundamental concept is to wirelessly connect everything. Through the Internet of things, all can be connected utilising a variety of sensor kinds made for different uses. The system for automating Streetlight and sending data from Streetlight via the Internet is the main topic of this article. This smart streetlight system can turn the light on and off automatically based on the surrounding conditions. The environmental conditions are determined using a light reaction detector and a wetness and temperature detector. Once the brightness of the surrounding area is reduced or boosted above a predetermined threshold, the Lamppost gadget activates and deactivates. The humidity detector may adjust the colour of the road to provide improved visibility by measuring the amounts of atmospheric humidity viewing in different climates.



## AN EXPERIMENTAL CRACK EVOLUTION OF CONCRETE WITH FLY-ASH AND HYBRID FIBERS

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### Abstract

Concrete is a significant building material that is utilised globally. Around 7% of the CO<sub>2</sub> produced globally comes from the manufacture of cement. This seriously harms the environment of the planet and depletes its natural resources. Therefore, the development of a substitute for cement in the construction industry is important. In this work, cement is used as a binder in place of fly ash. Fly-physical ash's characteristics have been identified. With the addition of fibres and admixtures, the strength of the concrete changes. Steel, polypropylene, and basalt fibres are among the many types of fibres employed in this study to assess the strength properties. Different amounts of the fibre used in the concrete are utilised to define the strength characteristics, together with the fly-ash drying for seven and twenty-eight days at room temperature. The primary goal of this paper is to understand how a construction cracked when fibres were added to the concrete. For the crack study, a T-beam segment with various fibre proportions was taken into consideration. The T-ultimate beam's load and deflection were 0.6% steel fibre, 0.3% basalt fibre, and 0.1% polypropylene, with a maximum deflection of 62.27 mm and an ultimate crack load of 48 KN.

Keywords: Fly-ash Steel fibre Polypropylene fibre Basalt fibre Strength T-beam Crack analysis Ultimate load Deflection



**STABILITY INDICATING RP-HPLC METHOD FOR THE ANALYSIS  
OF DACOMITINIB AND ITS RELATED IMPURITIES IN BULK AND  
ORAL SOLID DOSAGE FORMULATIONS**

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**Abstract**

A drug called dacomitinib, an inhibitor of the epidermal growth factor receptor, is used to treat metastatic non-small-cell lung cancer. No substantial HPLC approaches that address the contaminants and degradation products produced during stability investigations have been publicly acknowledged. In order to determine Dacomitinib in the presence of its associated impurities and degradation products, an isocratic RP-HPLC-UV technique was devised. Dacomitinib, impurity 1, and impurity 2 were separated using an Agilent ZORBAX Eclipse column (250 x 4.6 mm; 5 id) as the stationary phase, 0.1M sodium perchlorate at pH 5.6, acetonitrile as the mobile phase in a 20:80 (V/V) ratio at a flow rate of 1.0 mL/min in an isocratic condition, and UV detection at 253 nm. When conditions are optimal, clearly resolved and maintained peaks were seen for Dacomitinib, impurity 1, and impurity 2 at retention times of 5.8 min, 4.0 min, and 7.7 min, respectively. For impurity 1 and 2, respectively, a very sensitive detection limit of 0.06 and 0.025 g/mL was found in the approach that was devised. For Dacomitinib, the calibration was found to be between 20 and 200 g/mL, and for impurities 1 and 2, between 0.2 and 2 g/mL. The effectiveness of separating contaminants from degradation compounds produced under various degradative circumstances was investigated using the suggested approach, which supports the assertion that the method is stable. In light of these findings, it can be said that the method was found to be straightforward, sensitive, specific, accurate, linear, exact, tough, robust, and suitable for estimate and characterizing the stability of Dacomitinib, impurity 1 and 2.



## IMPLEMENTATION OF SEQUENCE DETECTOR USING OPTIMIZED GDI TECHNIQUE

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### Abstract

Due to technology scaling beyond sub-100nm, power saving has recently become the most important component of a circuit. Sequential logic blocks, in addition to combinational logic, are crucial in the design of powerful complex computing systems. The Optimized GDI Technique (OGDI) for the construction of sequential logic blocks is introduced in this research. The performance of an OGDI-designed sequence detector is compared to that of a traditional CMOS detector. In compared to CMOS logic, the findings obtained with OGDI logic demonstrated a considerable improvement and more than 28% power savings. For simulation and analysis, 45nm technology is employed along with Cadence Virtuoso.



## TRIPLE NOTCH SLOTTED MONOPOLE ANTENNA WITH COMPLEMENTARY SPLIT RING RESONATORS

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### Abstract

This paper's main purpose is to demonstrate a triple band notched ultra-wideband design with a complementary split ring resonator (CSRR) and a patch with an inverted T-shaped stub. The planned antenna is 24.8 mm 30.3 mm and takes up a minimal amount of space. The proposed antenna, which has a  $r$  of 2.2 and a height of 0.8 mm, was constructed using RT/duroid material. In the UWB band, it emits a constant dipole-like pattern in the E-plane and an omnidirectional pattern in the H-plane. Combining defective ground structure (DGS), CSRR, and inverted T-shaped stub yields triple notch bands with characteristic frequencies at 4.4 GHz (for RFID applications), 6.8 GHz (for RFID), and 9.2 GHz (for radar applications), respectively. To analyse antenna parameters in target frequency ranges, HFSS simulation was used. a solid With the exception of notch bands, gain of 4 dB over the working band is obtained. Excellent simulation findings are being matched with the prototype antenna.

**Keywords:** complementary split ring resonator; CSRR; defected ground structure; DGS; slotted monopole; triple notch.



## Modified Analysis of SMO, PSO, GWO and ABC Algorithms for MPPT in Photo-Voltaic Systems

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**Abstract:** Once the photovoltaic (PV) panels are exposed to partial shading conditions, conventional algorithms utilized to achieve maximum power point monitoring (MPPT) cannot meet the global maximum power point (GMPP). Therefore, this article provides a comparative study of 4 MPPT algorithms used in a PV system. These 4 MPPT methods are established on spider monkey optimization (SMO), grey wolf optimization (GWO), artificial bee colony (ABC) and algorithms for particle swarm optimization (PSO), correspondingly, applied to partial shading conditions. The GMPP can always be tracked by these algorithms, which present poorer power fluctuations in the steady state. In accumulation, these algorithms are tested and related to each other, enchanting into interpretation three dissimilar cases: I<sub>PV</sub> arrays functioning under normal assessment conditions of constant sun irradiation; (ii) and (iii) PV modules operating under dissimilar partial shading circumstances. Using the simulation outcomes, the efficiency of the accessible MPPT algorithm is estimated and related to each other in the light of steady state power fluctuations, the convergence time, and the tracking factor to grasp the GMPP.

**Keywords**—Spider monkey optimization (SMO), Ant Bee Colony (ABC), Grey Wolf Optimization (GWO), MPPT, Partial Shading Conditions, and Particle Swarm Optimization (PSO).



## Design of Z-source Inverter for Electric Vehicle

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**Abstract:** The need for Electric Vehicles design comes from the demerits of the I.C engine powered vehicles which have been a dominant and renowned mode of transport since inception. Moreover reasons like carbon emission, depletion of fossil fuels etc., have propelled the need for consolidation of EV's into daily custom. Despite of EV's possessing their complexities involved like the converter design and problems (which are as well, being studied under this project), the losses, reliability issues and soon and so forth. This project fixates more on the converter reliability, when seen from the load side. As an integral sector of the project, the work done on the ZSI with the simulation is being attached with the project. One of the customarily asked question With regard to EV is the Rating and Torque given by the motor, after the charging issues. This project also targets upon the significant advancements that have been taken place over the period, as on date. Besides, the regular issues faced with the VSI are brought into limelight and the remedies like the change in Topologies and algorithms to minimize the adversity of the magnitude of stress that the switches in the converters face are looked into, in this project. Though, this project targets on the entire EV design. Firstly, the mechanical and electrical calculations for EV Setup design were done. Secondly Z-source Inverter has been integrated in to the design. The DC link Voltage regulation, stator and rotor currents, torque and speed of the induction motor drive performance for the designed EV setup have been investigated through MAT LAB simulation

**Keywords**—Z-Source inverter, EV ,Induction motor, Sine PWM ,V/f control



## Electricity Generation Using Solar Power

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**Abstract:** Today energy is the main inspiration for socio-economic development. But due to incremental rate of environmental concern renewable energy provide a significant interest. This alternative power source is continuously achieving greater popularity due to continuous reduction in fossil fuels. It is the energy comes from sun, wind, rain etc. Among the non-conventional, renewable energy sources, solar energy affords great potential for conversion into electric power. Maximizing power output from a solar system is desirable to increase efficiency. In order to maximize power output, needs to keep the panels aligned with the sun. This paper deals with the electricity generation using solar power. The proposed system ensures the optimization of the conversion of solar energy into electricity by properly orienting the panel in accordance with the position of the sun. The operation of the paper is based on a Stepper motor intelligently moves a panel according to the light intensity of the sun sensing by light sensor.

**Keywords:** renewable energy, solar PV system, Solar Tracking system, power generation



## IOT based WPT powered Automatic Sanitize Dispenser

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**Abstract:** The utilization of sanitizer during the pandemic is a hygiene requirement. One takes personal responsibility for using the hand sanitizer but ensuring the crowd maintains the hygiene practice needed automation systems. The present paper demonstrates the integration of sensors and actuators to make an automated sanitizer dispenser. The integrated components are two IR sensors, Ultrasound Sensor, Relay controlled DC Pump, and Arduino embedded controller. The Model dispenses sanitizer when the hand interrupts the two IR sensors. The level of the sanitizer is monitored over IoT and it's powered through wireless Power Transfer. This project endorses wireless technology to power up IOT Sensor nodes whose actual source is a mere battery/230V AC supply, which is a potential environmental hazard.

**Keywords:** IR Sensor, Ultrasound Sensor, IoT (Internet of Things), WPT (Wireless Power Transfer)



## Experimental Determination of State of Charge of Li-ion Battery

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**Abstract:** State of charge (SoC) is the level of charge of an electric battery relative to its capacity. In an electric vehicle, SoC for the battery pack is the equivalent of a fuel gauge. SoC cannot be measured directly. A battery pack consists of number of cells arranged either parallel or in series. Different cells have different voltages and currents so measuring a battery pack is difficult. There are different techniques to measure SoC of a battery. The look-up table method exploits the direct mapping relationship between SOC and the external characteristics parameters such as the open-circuit voltage (OCV), impedance, etc. The major drawback of look-up table methods is that they are only applicable when the battery is in the static state i.e. not subjected to any load and allowed sufficient rest time to achieve an equilibrium stage. The coulomb counting method is by far the most widely used approach of estimating SOC. The SOC is measured using this method by calculating a battery's discharging current and integrating it over time. Since this is an open-loop algorithm, errors in SOC estimation are possible. A minor measuring error may have a major impact due to the accumulated effect of the integration operation. This project is implemented with the help of raspberry pi the Kalman Filter algorithm, which was derived earlier, to implement it functionally and to verify the efficiency of our algorithm. Furthermore, by measuring the model parameters using data driven techniques to estimate SOC of battery under operating conditions of EV and further validation with the experimental implementation

**Keywords:** State of charge, lithium-ion battery, electric vehicle, model-based approaches, raspberry-pi



## State of Charge Estimation Approach for Electric Vehicles using Multivariate Regression and k-Nearest Neighbor Regression

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**Abstract:** The State of Charge (SOC) is key parameter in battery management system to evaluate the other parameters like state of health (SOH), cell equalization and to compute power limits of the battery. An accurate SOC estimation is required to detect perilous conditions and improves its efficiency. Modelling of BESS used for applications such as smart grids and electric vehicles depends on accurate estimation of SOC. However, estimation of SOC is quite difficult process since it depends on many nonlinear characteristics, aging of battery and complex electrochemical reactions. In this paper comparative analysis of Multivariate regression and K- Nearest Neighbor regression methods are used for accurate estimation of SOC. Since the advancement of data science, machine learning techniques are used for estimation of SOC in electric vehicles. These techniques do not require extensive domain knowledge and complex mathematical equations. These models are tested with experimental datasets of the lithium-ion battery to estimate the SOC using input parameters such as voltage and current at constant temperature. The objective is to reduce the error and improves the accuracy for estimation of state of charge. The results are validated based on Coefficient of Determination (COD) and Root Mean Square Error (RMSE) in both cases. Results show that KNN has better accuracy than Multivariate regression model in terms of both COD and RMSE. These results show that KNN is used for estimation of SOC in real time applications such as electric vehicles and battery energy storage systems.

**Key words:** Electric Vehicle, Battery Management system (BMS), K Nearest Neighbor (KNN), State Estimation, Machine Learning, State of Charge (SOC), Coefficient of Determination (COD), Root Mean Square Error (RMSE), Remaining useful life (RUL), State of Health(SOH)



## A Comprehensive Study on Shunt Active Power Filters for Grid – Tied Wind Systems

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**Abstract:** The term power quality (PQ) has got major attention at the distribution side and consumer side in the recent years. Continuous rise of power electronic devices in grid-tied applications, uninterruptable power supplies (UPS) and motor drive applications etc, simplifies the control technology, and makes the system robust and flexible. But, these devices inject the current harmonics into the line which pollutes the electrical system. In addition, it draws more reactive power and creates the unbalance in the system. Initially, passive filtering techniques (inductors and capacitors) were used to lessen the PQ problems. Because of the lacking of the quality performance, the passive filter methods have been replaced with advanced power electronic topologies. Researchers, constantly investigates for better and cost effective solutions to improve system PQ. Shunt active power filter (SAPF) is one of the better solutions for enhancing the power quality by compensating the harmonic currents and other reactive power problems in the grid-tied system. In this paper, the basic structure of SAPF is briefly discussed along with the detailed control system functionalities. This paper provides a concise assessment on SAPF classifications, topologies and comparisons of single-phase, three-phase three-wire (3P3W) and four-wire (3P4W) systems. The features of all the configurations are provided along with their complications, so as to identify the better topology for specific application. The merits and demerits of these configurations are also discussed briefly.

**Keywords:** Active power filters [APFs], Shunt active power filter [SAPF], Power Quality, current source inverter.



## Analysis of Modified Quasi-ZSI In DCC And CC Modes

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**Abstract:** paper presents a novel technology of Modified Quasi ZSI to improve the voltage gain of converter without using additional passive components unlike the other traditional converters. In the proposed converter the gain of the converter is boosted by connecting one auxiliary switch and diode, so that the converter operates in two modes. I.e. continuous current and discontinuous current mode. This modes of operation are distinguished by changing the switch position and load parameters. Operating theory, steady state analysis, current stress, stored energy analysis, power loss, voltage stress, THD and efficiency are performed. Proposed converter operation is simulated and results are tested experimentally

**Keywords:** Total Harmonic Distortion, Quasi ZSI, High Gain, Discontinuous Conduction Mode [DCM], non-isolated dc-dc converter



## Enhanced Low Voltage Panel Switchgear Power System Design by Selecting Air Circuit Breakers (ACB) As a Function of Temperature

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### Abstract:

Low voltage switchgear power system is used to distribute supply to loads .Development is enormous best switchgear power systems are available from the suppliers .In the site where it is installed overheating is happening that is temperature crossing the limits because of this effect electrical components will damage, shut down of the switchgear for maintenance or repairs leading to the power cut. This will have an impact on loads where needed 100 percent reliability of supply required ,examples are factories, airports, hospitals etc. This paper discusses an enhanced low voltage switchgear power system design by selecting air circuit breakers as a function of temperature. Previously circuit breakers considered based on load ratings. Now the temperature effect is considered in my paper leading to breaker selection not only on load but also temperature factor. This minimizes the downtime, increase reliability and life and helps the designers and maintenance directors.

**Keywords:** Derating Factors ,Air circuit breaker,Switchgear



## Enhanced Pantograph Charger Design for Electric Bus using a Solid State Transformer

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### Abstract:

One of the major contributions of industrial technology is the invention of automobiles with heat engines. Automobiles in vast numbers are posing severe problems for society and humanity. The adverse consequences include a reduction in petroleum supplies, a reduction in air quality, and a significant increase in global warming. Electric, hybrid electric, and fuel cell-based drive train systems have long been regarded as the most exciting possible alternatives to the issue of land transportation. The development of solid state transformers (SST's) is based on Silicon carbide devices that are able to block higher voltages, switch faster than silicon (si) power devices. The Grid is stressed by electric vehicle charging systems and renewable generation causing voltage variations and SST's are the solution. This article discusses the ac pantograph charging of electric buses using a solid state transformer and the reliability of employing the two charging systems.

**Keywords:** solid state transformer(SST), Electric Bus, Low frequency transformer(LFT),  
Battery Pack, Pantograph.



## Energy Management In A DC Microgrid With Energy Storage System

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**Abstract:** The rapid penetration of Renewable Energy Source based Distributed Generation (DG) in the conventional power grid scenario forms a new type of power system, the Microgrid. Microgrid reduces the emission of greenhouse gas and the necessity of fossil fuels. Interfacing DG with the utility power supply has heightened the worry about the microgrid control and power sharing among multiple DGs. A control strategy with active power control is applied for power sharing among multiple DGs both in grid connected and autonomous mode of microgrid operation. The frequency of the microgrid is taken as a common signal among the multiple DGs for control over the power injected by DG. Hence real power-frequency (P-f) droop control is applied for DGs. The control strategies for the purpose power sharing, power quality enhancement and stability analysis are evaluated with the help of MATLAB/SIMULINK platform.

**Keywords:** Distributed Generation; Droop control; Grid interfacing; Power management system



## Novel switching design structure for three phase 21-level multilevel inverter fed BLDC drive application

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**Abstract:** Multilevel Inverters offers eminent solutions to high voltage high power applications due to the association of several devices in a series configuration. This is moderate because of getting superior quality voltage waveform when using multilevel inverters as compared to form two-level inverters. Most of the problems raised in this study are the restriction of many switching devices, which can afford high voltage are preferred in the inverter. Here, a novel multilevel inverter topology with no transformers, less number of switching devices and gate drive circuits are proposed. The proposed inverter topologies can valid more voltage levels with favorable advantages such as less number of switching devices and gate driving circuits and reduce to humble size, agreeable voltage profile. In this paper multilevel converter fed BLDC drive with different voltage levels and simulation analysis is presented. The validity of the proposed three-phase 21-level multilevel inverter fed to BLDC motor drive scheme is verified through Matlab/Simulink Platform.

**Keywords:** Brushless DC motor; Capacitor voltage source; Multilevel inverter; Total harmonic distortion; Voltage Source Inverter



## Dynamic Model Development for Lead Acid Storage Battery

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**Abstract:** It is widely accepted that electrochemical batteries ensure superior energy storage and reliability of power supply. This paper proposes to discuss the dynamic performance of the Lead Acid Storage battery and to develop an Electrical Equivalent circuit and study its response to sudden changes in the output. A detailed explanation of the discharging process for lead-acid storage batteries and the factors affecting the rate of chemical reactions is provided. The objective of the study is to find the reduction in terminal voltage due to the change in reaction rate and to evolve a simple dynamic model for discharge of the battery.

**Keywords:** Discharging process model; Lead acid storage battery; Matlab/simulink



## Performance Enhancement of Asynchronous Machine With Super Capacitor

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**Abstract:** The paper proposes the super capacitor which solves the high current starting problem of three phase induction machine when it is subjected to load condition. Super capacitor is a energy storage device, it will stores the energy in it at the time of normal condition, and at the time of load condition it will supplies the energy which is stored in it to the three phase induction machine. The three phase induction machine and DC motor are coupled by using a mechanical shaft. Super capacitor is place across the DC motor and a controller also used in this system. A circuit is designed like this by using MATLAB software to observe the problem of starting high currents in three phase induction machines.

**Keywords:** Controller; DC motor; Standalone battery; Super capacitor; Three phase induction-motor



## A Literature Review on Bidirectional DC-DC Converter Owing to Electric Vehicle Charging Station with Merest Transformers

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**Abstract:** Fast charging station acquired considerable emphasis in electric vehicle. Charging of electric vehicles connect to charging station contribute with minimum time, in view of this Electric vehicles demand in market, distribution system is at high risk. The battery energy storage system will diminish consequences on grid. This paper inspects various bidirectional DC-DC converter, Dual Active Bridge (DAB) is more advantageous through soft switching, under wide load variations also address to charge high voltage battery of electric vehicles. with manner of multiple energy storage system for bidirectional energy storage system DAB increases power components and high frequency transformer. over Quadruple Active Bridge (QAB) converter offers good efficiency with multiple converters, this permits unique control of energy sources and reducing cost.

**Keywords:** Electric vehicles (EV's), DC DC converter, Dual active bridge converter (DAB) Quadruple Active Bridge), Zero Voltage Switching, Zero Current Switching, Zero Voltage Zero Current Switching, Medium Frequency Transformer



## Dynamic Response of Permanent Magnet Synchronous Generator Based Wind Firm during Abnormal Conditions

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**Abstract:** Wind energy Generation has increasing rapidly and become very popular in the last decade. Initially squirrel cage Induction generators used later Doubly Fed Induction Generators (DFIG) using for power conversion. Designing control circuitry for DFIG is the present toughest task for the developers. In recent Permanent Magnet Synchronous Generators occupying the gaps and filling the lapses. But protecting the machines and tuning the converters during abnormal disturbances is always the highest prioritised task. In this project, neural network based control strategy proposed to improve the stability. Matlab Simulink is used for implementation of proposed control strategy and to verify the performance of test system.

**Keywords:** DFIG, Permanent Magnet Synchronous Generator, Neural networks



## POWER MANAGEMENT STRATEGY BETWEEN PV-WIND HYBRID SYSTEM USING MPPT TECHNIQUES

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**Abstract:** The main theme is to maintain a power management strategy in grid interfaced hybrid system. Here, the PV and Wind Energy Systems considered hybrid connection systems. Wind and PV systems are more efficient DG systems, as freely available in nature. The DFIG based wind system is designed to generate 16kW and Solar system is designed for rating of 20kW power generation. In addition with battery management system also used for back-up purpose. An MPPT based DC-DC converters are proposed for both PV and Wind systems to improve the reliability and effective power management between the systems under different load conditions. This proposed system is verified in MATLAB simulink environment.

**Key Words:** Wind Energy System, PV Panel, MPPT Technique, Power-management, DC-DC Converter



## Optimal Placement and Sizing of DG for Loss Minimization Using ABC Optimization

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**Abstract:** Distribution Generation (DG) units are related to small generation units and located to the load centers or at the load centers. Most of the DG's are developed by use of small renewable and clean generation techniques. Those are wind turbines, photovoltaic, fuel cells, micro-turbines and so on. Distribution System Planning (DSP) is one of the most favorable technique in all the important challenges and it foremost by the system planners. Previous analyses have been indicated that the inappropriate selection of DG's locations and sizes. It will direct to more system losses than the losses before connecting DG. At present, utilities are facing the more power loss and less profile of voltage. It is done especially in developing countries and they cannot tolerate these losses increment. By optimum allocation of DG's, there will be reduction in system losses, improved in voltage regulation, also improvement in supply reliability in distribution system. In this project, analyze the reduction in yearly energy losses of the distribution system by DG's are placing in optimum location along with size or range. The following constraints are considered to limit the system losses: voltage limits at different buses of the distribution system, feeder capacity, less size of the DG unit, more utilization of each bus and more connection limit of the DG system. Because the solar and wind-power based generation is subjected to most unpredictability in all other DG techniques and also the load on each bus might not be at its peak all the time, these uncertainties are taken into account. A probabilistic approach is simulated in MATLAB to achieve the objective.

**Keywords:** Distributed Generation, Reactive Power, Optimization Techniques, Artificial Bee Colony, Voltage Regulation



## **An Internal Current Controlled BLDC Motor Drive Supplied with PV Fed High Voltage Gain DC-DC Converter**

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**Abstract:** The paper presents an efficient speed control of brushless DC (BLDC) motor drive for photo-voltaic (PV) system fed system. A high-gain DC-DC converter is employed in the system to boost the PV system low output voltage to a level required for the drive system. High-gain DC-DC converter is operated in closed-loop mode to attain accurate and steady output. The converter (VSI) for BLDC is switched at fundamental frequency and thus reducing high frequency switching losses. Internal current control method is developed and employed for the speed control of PV fed BLDC motor. The appropriateness of the internal current controller for the speed control of PV fed BLDC motor is verified for incremental speed with fixed torque and decreamental speed with fixed torque operating conditions. The system is developed and results are developed using MATLAB/SIMULINK software.

**Keywords:** BLDC Motor, Drive, High-gain DC-DC, Internal current control, Photo-voltaic



## A Solar PV-Powered BLDC Drive for EVs to get Flexible Energy Control Functions

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**Abstract:** The paper presents a TriPort converter coordinated between Brushless DC drive and solar PV, battery to increase the driving distance of electric vehicles. The assurance on battery of the EV's can be reduced. In this system, A BLDC drive is used along with solar PV for better traction characteristics i.e., more starting torque and more efficiency. BLDC motor is suitable for EV's because of its better traction characteristics and for more power density. The main module of this is to control the energy flow from PV panel, battery, grid to BLDC motor. This can be done using Matlab/Simulink to know the efficient working of TriPort converter. For the flexible energy flow to control driving and charging, six modes of operation are developed.

**Keywords:** Brushless DC motor; tri port converter; PV panel; Matlab/Simulink



## BLDC Motor Rotor Position Estimation in the Absence of Sensors

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**Abstract:** This paper discusses about finding of initial rotor position when motor is not yet started or motor is stand still. The main or key point of finding initial rotor position is by simple detection and voltage comparison of each phase & responses of current which is related with the stator inductance variation. In the proposed method 3 voltages-pulse are injected and we achieved a resolution of 30°. The method effectiveness is verified by using simulation. In extension of this we derived an equation for initial rotor position. Which depends on the currents of each phase.

**Keywords:** Brushless DC(BLDC) motor; Voltage-pulse injection; Initial rotor position; Regression method.



## Efficient Control and Battery Bank Optimization for PV Assisted Electric Vehicle Charging Infrastructure

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**Abstract:**The faster rollout of high power charging stations increases load demand on grid by manifolds. Therefore there is a need for renewable assistance at the high power charging stations. This paper proposes control of dc-dc and bi-directional converters for Solar PV assisted charging station and a novel method for battery pack sizing which utilizes the intermittency of the load. The Control algorithms were tested using MATLAB / SIMULINK. A comparative analysis of battery pack sizing is also presented.

**Keywords:** Charging Station, PWM control, Solar PV



## Power Source Scheduling and Control of Solar PV Assisted Electric Vehicle Charging Station

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**Abstract:** A highly reliable charging infrastructure with renewable sources in picture needs an effective electrical interface design, efficient control algorithms and artificial intelligence systems for information exchange and coordinated control. The existing infrastructure such as power electronics for solar PV power extraction, ac to dc conversion at unity power factor with excellent harmonic reduction, energy storage interface, communication providers are available as individual players. A coordinated and efficient control of which is necessary for suitability to charging load characteristics and minimizing conventional source contribution. The proposed work aims at power source scheduling. The intermittent nature charging load allows PV source to supply battery pack during multiple short offload durations. A control algorithm for the same will be designed and tested using m Artix-7 FPGA based digital controller.

**Keywords:** Charging Station, PWM control, Solar PV



## Novel Programmable Solar Based SIMO Converter for SMPS Applications with IOT Infrastructure

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**Abstract:** The technological advancements lead to depend more on electronic goods which consume DC power. The DC appliances need converter circuits that are unique concerning their voltage and current ratings. In this paper, IoT enabled Programmable DC-DC converter is proposed for Solar dependent on DC Loads. The economically viable reconfigurable converter is achieved using a customized IoT board SPELEC. The primary step of the design to feed the SIMO converter from 230-Watt solar panel, the second stage 25 Khz pulses are generated from the SPELEC board to trigger the converter MOSFETs and in the Third stage of design, an MPPT Pertube and Observe (P&O) algorithm is implemented to maintain SIMO converter output Voltage's constant irrespective of the solar panel voltage fluctuations based on duty change in trigger pulses to the MOSFETs. The design aimed to cater to DC loads of different voltages as 9V 12 V and 24 V act as a solar spike. IoT-enabled features are Solar Panel voltage and Load Currents along with Load isolation using Blynk Mobile operated Relay control. The Sensor data is uploaded for visualization and analysis on Thingspeak Cloud. The recorded voltage is in the range of 0 to 12v and current is 0 to 1.5A and power is from 0 to 20watts. The SPELEC Converter performance is compared with the Arduino-based converter and an improvement in ripples is recorded.

**Keywords:** SPELEC board, SMPS, Programmable controller, Buck converter, Arduino,P&O,MPPT Technique, Thingspeak,Blynk



## PATH CONTROLLED SELF-BALANCED ROBOT FOR UV SANITIZATION APPLICATION

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**Abstract:** For the past decade, robotic devices have been successfully used to execute complex tasks with differing degrees of intellect. Personal services are becoming more important in commercial robotics solutions. Personal services robots are equipped with the autonomy and technical capability to work in a wide range of environments and offer services such as health care, schooling, domestic tasks, entertainment, and recovery. These personal robots perform a wide range of functions that are normally unexpected. However, there are a few technological issues to be aware of. Integrating a robotic system and its modules is usually a daunting process. It's also challenging to design a compact robotic device that can operate in a range of environments. Human Machine Interface (HMI) is used for interfacing with model and control the model with mobile by giving the path in mobile. Aim of this project is to sanitize the room by using UV light and it should be controlled by mobile. In this pandemic situation direct contact of objects is risking process where this model can be used.

**Keywords:** DC geared motor, Arduino Mega Board, MPU 6050, Monster Motor Driver



## Review of Multilevel Inverters for PV Energy System Applications

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**Abstract:** Over the last decade, energy demand from the power grid has increased significantly due to the increasing number of users and the emergence of high-power industries. This has led to a significant increase in global emissions with conventional energy generation. Therefore, the penetration of renewable energy resources into the power grid has increased significantly. Photovoltaic systems have become the most popular resources as their protentional is enormous, thus, the worldwide installed PV capacity has increased to more than 635 gigawatts (GW), covering approximately 2% of the global electricity demand. Power electronics are an essential part of photovoltaic generation; the drive for efficient power electronic converters is gaining more and more momentum. Presently, multilevel inverters (MLI) have become more attractive to researchers compared to two-level inverters due to their abilities to provide lower electromagnetic interference, higher efficiency, and larger DC link voltages. This paper reviews multilevel inverters based on their classifications, development, and challenges with practical recommendations in utilizing them in renewable energy systems. Moreover, PV systems with various maximum power point tracking (MPPT) methods have been extensively considered in this paper as well. The importance and the development of a modified multilevel inverter are also highlighted in this review. In general, this paper focuses on utilizing multilevel inverters for PV systems to motivate and guide society to focus on inventing an efficient and economical multilevel inverter that has the combined capabilities of these converters reported in the literature.

**Keywords:** multilevel inverter (MLI); PV system; maximum power point tracking; MPPT; modified MLC converter; leakage current suppression



## A Review Paper on Electricity Generation from Solar Energy

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**Abstract:** The Solar Energy is produced by the Sunlight is a non-vanishing renewable source of energy which is free from eco-friendly. Every hour enough sunlight energy reaches the earth to meet the world's energy demand for a whole year. In today's generation we needed Electricity every hour. This Solar Energy is generated by as per applications like industrial, commercial, and residential. It cans easily energy drawn from direct sunlight. So it is very efficiency & free environment pollution for surrounding. In this article, we have reviewed about the Solar Energy from Sunlight and discussed about their future trends and aspects. The article also tries to discussed working, solar panel types; emphasize the various applications and methods to promote the benefits of solar energy.

**Keywords:** Renewable energy, Solar panel, Photovoltaic cell, Modelling of PV Panel, Solar Concrete Collector



## IOT BASED BI—DIRECTIONAL METER

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**Abstract:** Smart grid technologies are developing rapidly in the world. These developments started from consumer side to make grid smart and easier to understand. The basic start is the meters, as many of the meters are normal power meters and only few are net meters. In this paper, bi-directional meters are designed. These meters calculate the bidirectional flow of power. Power bill, advances in smart grid technology and feasibilities provided to customers can be observed by the customer with the help of IoT without any interference of third person. Now-a-days generating units must increase their generation due to the load demand at the consumer side because many of end consumers are not getting sufficient power to run their loads. Distributed generation is one of the best alternatives to meet the load demand. Bidirectional meter is very much useful for consumer to observe transfer of power from consumer to grid and vice versa. With this, expansion of generation system can be reduced drastically. Bidirectional meter measures how much the consumer export and import the power in efficient manner and calculate the bill and communicate to the utility and to the customers through IoT devices. This continuous monitoring can be done in the IoT platform, so load flow analysis and steady state estimation can also be done for individual user and to the whole distribution system. Experimental results are varying with the error of + 3% to + 5% compared to the calculated results. Bi-directional meters become a huge start up for the smart grid implementation in. Bidirectional meters can reduce losses, reduce burden on grid, improve billing efficiency and continuous monitoring by IoT platform.

**Keywords:** smart grid, IoT, bidirectional meter, Arduino



## Improving Reliability of Distribution System using Demand Response

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**Abstract:** Reliability has become major concern in the recent years. Reliability is an essential quality of a power distribution system. Reliability is the quality of distribution system to provide continuous and uninterrupted power supply to the consumers. Utilities always aim to find methods for improving the reliability in order to satisfy the consumers. Utilities uses different existed methodologies to boost the reliability of distribution system. In this paper, Demand Response (DR) approach is used to boost reliability of the considered distribution system. The indices such as System Average Interruption Frequency Index (SAIFI) and System Average Interruption Duration Index (SAIDI) are used for reliability analysis.

**Keywords:** demand response, distribution system, reliability,



## Impact of Electric Vehicles to improve the reliability of IEEE 14 bus System

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### Abstract:

Today's bulk power system is massive, complex, and very dynamic. The ecosystem friendly and socio-economical merits of Electric Vehicles (EV's) have enhanced its application globally. Although it is widely argued that EVs grid integration undermines power system security, reliability, and upsurge electricity consumption, but the benefits in emission reduction is enormous. generator outage is made at individual bus and observed that voltages are not within the limits at buses. Later an EV is connected at specified bus, which helps to balance the load and voltages within the specified limits. There are three generators at 1,2 and 3 buses and two synchronous compensators at 6 and 8 buses in IEEE 14 bus system. Thus, the impact of EV's on IEEE 14 bus system under a generator and synchronous compensator outage is tested and the results are validated, which helps to ensure the reliability of system.

**Keywords:** IEEE 14 bus system, Generator, Synchronous Compensator, Electric Vehicle (EV)



## INTERFACING OF WIND ENERGY CONVERSION SYSTEM WITH SOLID STATE TRANSFORMER FOR SEAMLESS FAULT RIDE THROUGH OPERATION

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**Abstract:** In wind vitality change frameworks, the major recurrence venture up transformer goes about as a key interface between the breeze turbine and the lattice. As of late, there have been endeavors to supplant this transformer by propelled control hardware based strong state transformer (SST). This paper proposes a setup that consolidates the doubly bolstered enlistment generator-based breeze turbine and SST activity. The primary target of the proposed design is to interface the turbine with the lattice while giving upgraded task and execution. In this paper, SST controls the dynamic capacity to/from the rotor side converter, accordingly, wiping out the network side converter. The proposed framework meets the ongoing lattice code prerequisites of wind turbine activity under blame conditions. Also, it can supply receptive power to the framework when the breeze age isn't up to its appraised esteem. An itemized reenactment examine is directed to approve the execution of the proposed setup.

**Keywords:** Shunt Active Power Filter, DC-DC Converter, PV Array, Fuzzy Controller, PI controller



## A Machine Learning Scheme to Identify Coherency of Generators in Power Systems

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**Abstract:** The controlled islanding scheme is a last resort for keeping the transmission system operational during cascading event outages that could result in a major blackout. It divides the network into stable and unstable islands, reducing the spread of uncertainty. To introduce supervised islanding, we must first identify the system's coherent classes. The RMS value of the equivalent machine model's relative angular difference built across all generator buses from local measurements is used to describe generator coherency in this paper. They are processed by k-means clustering after calculating the RMS value, classify the stable and unstable generators. The proposed methodology's efficiency will be tested using the IEEE 39 bus benchmark. The results of the simulation are then compared to approaches that have recently been published in the literature.

**Keywords:** Cascaded tripping, Special Protection Schemes (SPS), Generator Coherency Identification, Power System Stability, Controlled Islanding.



## A Wavelet Approach to Controlled Islanding of Power Systems

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**Abstract:** Controlled islanding is used as a last plan of defense against cascaded tripping caused due to severe disturbances in wide area power systems. It limits the spread of disturbance by splitting the system into healthier and problematic islands. This paper presents a controlled islanding scheme that optimally splits the system into two islands considering net power flow between them as minimum. A new index called Load Generation Imbalance (LGI) index based on wavelet energy is introduced, which takes care of segregating the buses between the two groups to satisfy the optimality condition of net power flow at the boundary of the two islands. In the first phase of the proposed methodology, generator coherency is identified using RMS value of relative angular difference of equivalent machine model developed from local measurements at all generator buses. The solution of first phase initiates the controlled islanding scheme in the second phase, in case instability of the system is detected. The performance of the proposed methodology is tested on IEEE 39 bus system. The simulation results are compared with the recent methods reported in the literature.

**Keywords:** Cascaded tripping's, Special Protection Schemes, Generator Coherency Identification, and Controlled Islanding.



## SEPIC Converter based Power Factor Correction for BLDC Motor

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**Abstract**— In this paper, a (PF) Power factor correction based BLDC motor drive is proposed. Normally the permanent magnet BLDC motor drive connected with the diode bridge rectifier and high value of the capacitor due to which poor power factor is observed. The employment of power Factor correction within the power provide to maximise power from mains electricity and SEPIC convertor is employed for the ability issue correction. For increasing energy potency and to scale back electricity value power issue correction is critical In this project, we would like to implement sensing element speed detection and power issue correction in BLDC motor in MATLAB simulation platform

**Keywords**- SEPIC Converter, BLDC Motor, Power Factor correction



## Speed Control of Axial-Flux Permanent Magnetic Synchronous Motor using PI Controller

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**Abstract**—This work gives a clear view about control methods of the permanent magnetic synchronous motor with the help of PI Controller (Field Controlled) and PWM technique and the hall effect sensor is being used. This work provides a PI controller for speed control of a PMSM power by means of the usage of the PWM and hall effect sensor technique carried out to speed manipulate leads to an advanced dynamic behavior of the motor drive system and a proof towards load perturbations and parameter variations. The simulations of each the controllers were performed with the parameters speed responses, received underneath PI and hall effect sensor, are in comparison for an expansion of working conditions. PI controlled PMSM generates an advanced speed reaction and offers exceptional output.

**Keywords**— PWM inverter, PI Controller, Hall effect sensor, Permanent Magnetic Synchronous Motor Block, stator phase inductance, flux linkages, Rotor speed, Rotor angle theta, Electromagnetic torque, stator resistor



## An Embedded Prototype for Monitoring and Control of Air Conditioner Appliance

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. **Abstract**-Air conditioners are used to alter the room atmosphere. In a tropical country, air conditioning is essential for keeping the surroundings cool. The use of air, on the other hand, Conditioning is uncontrollable and leads to an increasing in Energy use, power costs, and carbon emissions.The objective of this project is to create an Internet of Things. As a data extraction tool. The Node MCU board is an opensource Internet router, use to extract the information. ESP32, a Wi-Fi system on a chip, is incorporated on the Internet of Things. Sensors are utilised to keeptrack of the energy management of the chosen object. Voltage power current, energy, and power factor can all be detected in this room. temperature and relative humidity, vibration,sound the microcontroller is in charge.to move all the microcontroller is in charge.in the presence of the internet, to transmit all the acquired values to an open cloud server. These findings have been applied to Admin is a database that acts as a storage system. In the presence of the internet, user scan use the ESP32 microcontroller. To surveillance, the user can turn on and off the electrical system. By monitoring in things speak software, we can control.

**Keywords:** Esp32, voltage, current, humidity, vibration Sound sensors.



## Bi-directional VSI Based Regenerative Braking for Electric Vehicles Employing BLDC Motor

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**Abstract** - Now a days, BLDC motors can be widely employed in the Electric Vehicles because of their more density of the power, speed-torque characteristics and high efficiencies. In this paper, a Bi-directional Voltage Source Inverter (VSI) is introduced for having the energy flow between the battery and the Brushless DC (BLDC) Motor under the braking mode. There is no need of extra circuit for this operation. Here the voltage source inverter acts as bi-directional converter which allows bi-directional energy flow in the circuit. The system usage will be in Electric Vehicles (EV's) due to the simple circuit with lesser number of components. The speed is maintained in the electric vehicle under the braking condition. The system gain is improved by bi-directional voltage source inverter. During braking mode, the BLDC motor gives back the energy to the battery. Thus energy is not wasted and will be circulated again in the system. This is done using MATLAB/SIMULINK software.

**Key Words:** Bi-directional Voltage Source Inverter, Brushless DC Motor (BLDCM), Electric Vehicles (EVs).



## Solar Inverter Tripping Identification

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**Abstract**—The 55 KVA Solar inverters present in the University campus trip due to momentary insufficient irradiation or due to over load which causes interrupted power supply to the load fed by the inverter. This can be rectified only when the technician is present over there, which is hardly possible since they should be informed by any other person who notices. In this project, when the inverters got tripped, immediately a call or message will be sent to the particular technician. As it is known that when the inverter is tripped the output current becomes zero, a clamp type current sensor is used here to know the output current. This current sensor or current transducer is connected to a microcontroller (esp32, Arduino) where the programming is done and this setup is connected to communication protocol, through this setup the technician will receive an alert message or call and eventually fixes the problem.

**Keywords**— Communication, Arduino, Current. Introduction



## Design of A 48V 13S Battery Management System for Enhanced Electric Vehicle Performance

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**Abstract**—State of Charge (SOC) estimation plays a vital role in electrical vehicles' performance. With the help of estimated SOC the driving range, State of Health (SOH), energy and power limits can be determined. The conventional way of estimating SOC doesn't include the sensor and process noise measurements. In this light, the model and data-driven-based methods served better accuracy in estimating SOC considering all the effects. Besides, the primary step will be the modeling of the battery with consideration of all the behavioral effects of the battery. Further, using MATLAB Simulink, the model is developed and executed under New European Drive Cycle (NEDC). The performance of the battery is analyzed using the coulomb counting method. Later the analysis can be extended in the direction of Kalman filter algorithms

**Keywords**— the state of Charge, State of Health, Drive Cycle, NEDC, Coulomb counting.



## Transmission Line Fault Analysis using GSM

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**Abstract**—Transmission lines are one of the most important part of the power system network. The primary function of the transmission lines was to transmit electric power from the source area to the distribution network. As power consumption increases, the emphasis is on minimizing power losses such as technical losses and commercial losses. Another important factor is that it had a reactive power and voltage variation in the long-distance transmission power line. In essence, fault analysis is a high-priority issue in power system engineering, with the goal of clearing the fault in a short amount of time and re-establishing the power system as rapidly as possible with the least amount of downtime. However, detecting a failure that interrupts the transmission line is quite difficult task undertaking in and of itself, as it requires both investigating the fault and enhancing the system's reliability. Given all of the parameters that connect the entire power system, the transmission line is vulnerable. Transmission lines carry a significant quantity of energy. The proposed system is intended to detect the location of fault in transmission line using an GSM (Global System for Mobile Communication) and GPS technology. This proposed model uses the concept of advanced power system to detect the fault location, which is quick, reliable, and cost effective.

**Keywords**—Esp32- Communication, GPS,GSM



## Novel IoT & Machine Learning Base Water Flow Monitoring System

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**Abstract**— This proposed structure sees a steady water stream past the customary pausing and beginning of our standard mechanical congregations, it stops the development of water into our machine regularly. This work has been supposed to utilize the Arduino regulator, Esp32, for control and checking. For the absence of these models, wide usage of faraway designs and a savvy quality checking framework have been made utilizing the Android application. This water use information would be shipped to the cloud utilizing the IoT (Internet of things) space. This cloud information would be moved off the concerned tenant's individual's versatile application pronouncing the water utilized and making the client aware of restricting the water. This will be a steady move.

**Keywords**—Esp32- Communication, Flow sensor, Arduino ide, Thing speak.



## Accelerometer Based Intra-Wireless Communication in Electric Vehicle

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**Abstract**— Wireless communication between vehicle Electronic Control Unit (ECU) nodes is proposed in this work. The data from sensors is sent into an ECU, which controls the operation of numerous actuators. All the actuators are connected via cables since the ECU position is set in a vehicle, no matter how far they are. Processors and microcontrollers are utilized in vehicles to enable wireless communication. The Arduino (microcontroller) is used to link the sensors and actuators, and the sensors data is then sent to the Raspberry Pi processor. The processor's reaction determines how the actuators work. Low-range wireless communication technology, such as the New Regulatory Framework (NRF), is utilized in vehicles since the distance between the control unit and actuators is short. The NRF transceiver module is extremely small and versatile, making it ideal for use in wireless interfaces. The transceiver module sends and receives data on a certain frequency, and two or more transceiver modules must be on the same frequency in order to connect with one another. Any frequency between 2.400 and 2.525 GHz might be used for this channel. The microcontroller is connected to the control unit through several sensors and actuators.

**Keywords**—Electric vehicle, Accelerometer behavior, ESP32 communication, Headlamp monitoring, Modular design.



## Development of IOT based Smart Street Lighting System

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**Abstract-**The rate of urbanization has accelerated dramatically in recent years. In order to create a better lifestyle in metropolitan regions, more upgraded services and apps are required. One of the smart applications that necessitates significant energy expenditures in the development of a smart city infrastructure is the street light management system. Because of the growing importance of energy conservation and good maintenance, new technologies have emerged that allow for significant energy savings, maximum environmental protection, and a reduction in traffic accidents. The primary goal of this study is to reduce energy waste and maximize energy efficiency. This smart lighting improves the efficiency of street lights while also creating a safe atmosphere. It also makes it easier to manage costs and power consumption. Here arduino, LDR module, SMPS module and few other components too. The principle of operation the LDR detects light and transmits the information to Arduino. Through the relay mechanism, the Arduino analyses the data and responds to the LEDs. The Arduino is programmed to adjust the lights automatically to provide the most accurate result possible. To reduce power usage, sophisticated operational approaches are required for regulating, maintaining, and communicating street illumination. As a result, there is a reduction in power usage while ensuring long-term street lighting.

**Keywords:** Smart lighting, LDR module, SMPS module



## Modeling of Electric Engine

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**Abstract**—The era of an Internal combustion engine has come to an end. So, every engine has to be dismantled and scrapped. Where the electric engine has the same hardware equipment as same the combustion engine. But, in Internal combustion engine, the piston movement is from combustion, Where as the electric engine piston is from repulsive force caused by the attraction and repulsion of electric magnets. The electric engine piston consists of 2 magnetic fields, permanent magnetic field, where a permanent magnet sits on right above the piston and the alternating magnetic field which is fetched by an electric pulse. The permanent magnet has a constant flux and the alternating coil creates alternate flux which pull and push the piston which rotates the crank shaft and causes motion. By comparing the cost of a motor either by replacing it with IC engine total installation cost will descend and the efficiency of the system will be improved.

**Keywords:** IC engine, crank shaft, Modelling of Machine(MOM).



## Design of Dynamic Wireless Power Transfer System For Electric Vehicle

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**Abstract** - Electrical vehicles unit of measuring seen as academic degree alternate choice in response to depletion of resources, so on extend the employment of EVs in commonplace of living, wise and reliable ways that within which to charge batteries of Electric Vehicles unit of measuring quite necessary, consequently wireless power transfer is taken into thought as an answer to charge batteries, throughout this project, a image system of wireless charger that have sixty rate operation frequency is supposed and enforced . Plug-in electrical vehicles (PEVs) unit of measurement burdened by the need of cable and plug chargers, galvanic insulation of in-vehicle physics, mass and price of the charger and also large energy storage system (ESS).But Wireless Charging system Provides convenience to the patron, it will inherent electrical isolation, regulation done on grid facet and scale back on-board ESS size pattern dynamic on-road charging, the foremost objective of this project is to vogue and develop antenna system applicable for vehicle mistreatment resonant magnetic coupled wireless power transfer technology to electrical vehicle charging system. Application of WPT in EVs provides a clean, convenient and safe operation. Core of WPT systems consisting of primary coil and secondary coil. Wherever the coupling constant is between zero.1-0.5 these coils construct a loosely coupled system. Therefore, on transfer the rated power, either side to be tuned by the help of resonant capacitors. The operative frequency could be a key choice criterion for all applications, and it notably affects all the dimensions of the coils and to boot the choice of the weather for flexibleness of electronic circuit.

**Key Words:** electrical Vehicle, Pulse breadth Modulation (PWM), Wireless Power Transfer (WPT), Inductive power transfer (IPT)



## Demonstrating the Predominance of Time Delays on Frequency Regulation of Dual Area Realistic Power System under 2DOFPID Controller

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**Abstract:** In this paper, the investigation is concentrating on demonstrating the prominence of time delays on the performance of dual area realistic power systems (DARPS). Step load perturbation (SLP) of 10% is injected in area-1 of DARPS for analysis purposes under the regulation of two degrees of freedom PID (2DOFPID) controller fine-tuned with modern heuristic optimization approach of seagull optimization algorithm (SOA) subjected to the index of integral square error (ISE). However, the efficacy of 2DOFPID is showcased upon comparing with PI/PID controller performances. The investigation is performed on DARPS with and without considering time delays and the simulation results deliberate the significance of time delays on frequency regulation of DARPS.

**Keywords:** 2DOFPID controller, 10%SLP, ISE index, time delays, seagull optimization algorithm



## A Hybrid Energy Storage System with a Modern Design for Rechargeable Vehicles

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**Abstract** - Electric vehicles (EVs) are a feasible technology for developing a sustainable transportation sector in the future due to their very low to zero carbon emissions, low noise, high efficiency, and versatility in grid operation and integration. This paper provides an overview of electric vehicle technology and the energy storage, charging systems that go with them. A novel Hybrid Energy Storage System (HESS) for a rechargeable vehicle is simulated in this research to give endurance across a long distance to make sure the reduction of a cost function for rechargeable electric automobiles. Based on the SOC of the supercapacitor and a Rule-based control of Li-ion battery power dynamic restriction, the paper proposes an optimal regulating method for the hybrid energy storage system. At the same time, DC-DC converters for electric vehicles are being equipped with magnetic integration technology that includes a second-order Bessel low-pass filter. As a result, the battery size is lowered, and the hybrid energy storage system's power quality is improved. Finally, MATLAB simulation results are used to verify the efficiency of the proposed strategy.

**Keywords** - Electric Vehicles, Electronic switching systems, Power system modelling, Hybrid energy storage system, SOC, integrated magnetic structure, DC-DC converter, power dynamic limitation



**Development of control strategy for an energy efficient Heating Ventilation and Air Conditioning System**

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**Abstract-In** view of growing demand and the environmental impacts of using conventional sources of energy, to reduce the impacts partially heating ventilation and Air Conditioning (HVAC) system is proposed as an alternative and replacement for the existing conventional CFC air conditioners. HVAC is best suited for the large-scale industries, institutions. In this project, HVAC types, various components their modelling will be explained. Utility oriented control strategy is proposed for effective functioning and achieving economical operation. Proto type is proposed with the proposed control strategy to demonstrate the system performance. Cost benefit analysis will also carry out for showing economical operation.

**Keywords:** HVAC, Heating , Ventilation , Air conditioning



## **A Relative Analysis of Enhanced Machine Learning Algorithm SVM & Decision Tree to Predict Smart Grid Stability**

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The demand for electricity has been rapidly increasing nowadays. So, it is necessary to distribute power to consumers efficiently. Smart grids (SG) can reduce the losses in the distribution of power. To achieve accuracy, artificial intelligence and machine learning techniques are implemented widely. There is an evident need of analysing and comparing different algorithms and choose the most suitable one to relate for Smart Grids. Several enhanced algorithms such as Random Forest, Support Vector Machine (SVM), Naïve Baye'sK Nearest Neighbour, Logistic Regression, Decision Tree, Stochastic Gradient Descent classifier, and Gradient Boosting are used for predicting the stability of SGs. In this paper, a comparative analysis between Support Vector Machine and Decision Tree (DT) has been focused based on evaluation metrics like precision and accuracy.

**Keywords:** Artificial Intelligence, Comparative Analysis, Machine Learning, Stability, Smart Grid



## Performance Evaluation of Micro-Grid with Hybrid PSO Algorithm

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**Abstract-** Worldwide, renewable energy sources are regarded the greatest alternative to fossil fuels. Solar, wind, biomass, hydro, and tidal energy are abundant in India. In India, there is a big disparity between demand and availability of electricity, and many places still lack electricity. A microgrid is a collection of renewable energy sources that can meet local energy needs. These microgrids can work with regular grids. Installing hybrid microgrid systems is the greatest way to deliver sustainable power to rural and isolated areas. A hybrid microgrid comprising PV, batteries, and a diesel engine can be used to electrify rural areas. The installed capacity of diesel generator is chosen for the essential load needs when renewable sources are unavailable. The battery capacity is chosen for the transition period between renewable energy sources or as a backup supply for diesel generators. The hybrid PSO/YYPO algorithm outperforms the conventional PSO algorithms in terms of control. In a grid-connected microgrid, distributed PV power offers enhanced voltage profile and reduced losses. For remote and grid-connected locations, microgrid systems give a technically and economically feasible alternative for reliable energy supply with decreased pollution and the potential for sustainable growth.

**Keywords:** Micro-Grids, Batteries, Photo Voltaic, Grid Side Converter.



## **Agriculture practices with smart sensors**

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**Abstract:** Especially agriculture is the main source of livelihood for many people in India. So, the objective of this paper is to specify that, making use of the sensors is one of the modern practices to enhance the crop productivity and sustainability. Wireless sensor network (WSN) technology also provides a decision support system based on soil moisture, humidity, temperature, sunlight, requirement of water by the soil, etc. addresses many issues. The end result of this paper is to give a surplus amount of yield with a minimal consumption of water, pesticides, fertilizers, etc.. So, sensors are more widely used to build various crop monitoring systems to overcome many problems that are caused due to lack of accurate agriculture system. Some natural factors such as temperature, humidity and water levels are most important for the productivity, growth, and quality of plants in agricultural fields. Various sensors transmit the gathered information through the wireless communication network to the data server (cloud) through an IoT gateway which is in charge of the communication between the serial devices and central control system. Through this continuous monitoring of many environmental parameters, farmers maximize their yields with the help of a precision agriculture by means of a minimal usage of resources like water, fertilizers etc.. This is possible by deploying various sensors and mapping their agriculture fields against the adverse impacts of environment.

**.Keywords:** Sensors, wireless sensor network, agriculture, precision farming.



## Survey on Various Cloud Security Methods

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**Abstract:** Cloud computing plays a significant role in effective data handling based on the increase in data usage in various real-time applications. Data auditing is performed on certain files and the authenticator with deduplication. It addresses the problem of key management to deduce the file content based on the malicious activities performed on the cloud. So, based on effective auditing of the integrity of the data and authenticator, the data is checked properly and minimizes the overhead of cloud storage overhead. In this work, the cloud audit and authenticator approach is proposed based on a certain file system, which makes the malicious user get authenticate the data auditing verification as the existing algorithm has low security based on entropy. They propose a data auditing approach that integrates with file management and the authenticator of data deduplication. The proposed approach performs the authenticator process and new form of file tag, which helps guarantee effective security based on the random generation of message key. The proposed approach achieves minimum computational overhead based on the authenticator and data block generation in the performance analysis. Then the security verification is performed on various attacks, such as brute force attack, a man-in-the-middle attack, etc., to check whether the approach is safe or unsafe against the attacks.

**.Keywords:** Deduplication, Authenticator, File Auditing, Entropy, Data Block Generation.



## Health Insurance using Blockchain Technology

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**Abstract:** Now a days Health insurance is overwhelmed by expansive and inefficient ecosystem of providers, insurers and patients. There are many issues met by both customers and insurers. Problems faced by insurance providers are patient data management, improper documentation, silos and building trust. Ownership of data, processing/denying claims with in a stipulated time, Identity theft etc. are faced by the health insurance consumers. These problems can be solved by using Blockchain technology, because the features of the Blockchain are data Integrity, Immutability, automatic execution of transactions and being a distributed ledger among all the peers in a Blockchain network. In the health insurance field deploying Blockchain technology will help the patient data access between hospitals and providers by using the smart contracts and processing claims will be faster. Data sharing among different providers accessed at any time and eliminate the identity theft. Based on the business rules involved in Health Insurance industry, smart contracts will be prepared for the transactions in the Blockchain. Patients(policy holder) registered with which hospital, with valid health cards, claims made by patient and claim amount received all these details will be mentioned in the smart contracts. if anything is not satisfied with the stated contract, the ledger will reject the transactions. Our proposed design handles the inexpensive approach for the transactions related to Health Insurance are done using Blockchain technology. It has been developed on the permission less blockchain Ethereum.

**Keywords:** Health insurance, Blockchain Technology, smart contract, Ethereum



## LoRa Network Development and Placement: A Terrestrial Navigation Systems

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**Abstract:** Long Range, also known as LoRa, is a popular low power wide area network (LPWAN) technology that operates in the frequency band known as the Industrial, Scientific, and Medical (ISM), spreading signal over distances greater than 5 kilometres in urban areas and 20 kilometres in rural areas, respectively. This is significant for applications in which LoRa could be utilised as a terrestrial navigation system, as well as for applications using wireless sensor networks (WSN). A crucial performance metric for categorization use in network planning and coverage estimation in ranging applications. The information is transmitted in the based on the conventional methods that broadcast it as a series of packets, each of which is recognised on its own. This strategy results in a long transmission time as a direct consequence of the time spent waiting for the several separate acknowledgements. For the purpose of transmitting navigation parameters, In this paper proposed advanced and dependable delivery protocol called LoRa. A LoRa testbed network is used to carry out the implementation of the proposed protocol and conduct the evaluation.

**Keywords:** LPWAN, WSN, Navigation, and Range Applications.



## Cuckoo Search Based Collaborative Movie Recommendation System

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**Abstract:** Recommender systems are information filtration technologies that aim to forecast user and item ratings, primarily from big data, in order to recommend their preferences. Systems for movie recommendations give users a way to group others with related interests. Consequently, recommender systems become a crucial component of websites and e-commerce software. This article focuses on movie recommendation systems, which use data clustering and computer intelligence to develop a recommender system. This research article discusses a novel recommender system that uses k-means clustering and the Movielens dataset in combination with the cuckoo search optimization technique. The systematic explanation of our method and discussion of the results that followed. The results have been examined and interpreted, and it is also contrasted with current methodologies. As our approach offers lower values of the mean absolute error, standard deviation, and root mean square error, evaluation measures like mean absolute error (MAE), standard deviation (SD), root mean square error (RMSE), and t-value for the movie recommender system produce superior results. When compared to existing methods, the experiment findings on the Movielens dataset show that the suggested strategy may offer great performance in terms of dependability, efficiency, and gives accurate tailored movie suggestions.

**Keywords:** Movie recommendation , mean absolute error, root mean square error, data clustering.

## CLSTM: A Deep Learning Model for Tumor Segmentation from Mammography Images



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**Abstract:** Mammography screening has been used as a tool for cancer diagnosis. However, the pre-diagnosis of cancer from mammographic images can be a challenging task. In recent years, many deep-learning models have been proposed to address this problem. This research proposes a deep-learning model, called Convolutional Long Short Term Memory (CLSTM) for tumor segmentation from mammography images. The proposed model is constructed with Convolutional Neural Network (CNN) and Long Short Term Memory (LSTM) networks. The results show that the proposed model CLSTM produced the highest accuracy of 87.25% and the F1-score of 77.58% compared with other related models.

**Keywords:** Mammography images, Deep Learning, and Convolutional Neural Network.



## Smart sensors and their applications

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**Abstract:** This paper gives a brief idea of the concept smart sensor technology. Today sensors have become an integral part of the devices that are being used in our everyday activities. These smart sensors typically consist of a sensor, a microprocessor and communication technology of some kind and it has intelligent capabilities i.e. it can process data and take decision on its own. Smart sensors have various advantages in comparison to conventional sensors such as smaller in size, minimum power consumption, and high performance. These are being widely used in various application such as smart parking, smart lighting, home automation, safety and in medical field etc. Hence efficient sensors must be developed and this is possible by advancements in materials science and engineering. The various concepts like sensors, it's classification, need of sensors in our everyday activities and application of these sensors are also discussed.

**Keywords:** Sensors, Smart Sensors, Sensor Characteristics, MEMS, VLSI, features, Applications.



## Real-time Embedded Automotive Dynamic Framework using Convolutional Neural Network

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**Abstract:** In this paper, research on an autonomous car that can recognise its surroundings using sensors is conducted. It does not require any assistance from passengers and is guided by the advanced car system. The intelligent system makes the car self-driving, and its future technology could have ramifications in a variety of industries and situations. In the proposed scenario, the Convolutional Neural Network (CNN), TensorFlow Lite, and OpenCV are used. A fully automatic self-driving car based on level-5 self-driving technology is being considered. Correspondingly, three algorithms were used to build the autonomous vehicle: lane detection, traffic sign detection, and object detection. Lane detection detects the steering angle of road lanes, traffic signs detection detects traffic signs, and object detection detects objects using a camera image as input. Each algorithm is created a module and combined these algorithms to make the best decision possible. The module can also sense its surroundings, such as estimating the distance between the vehicle and nearby objects, navigating the vehicle, detecting light, and collecting images from the environment. The vehicle was both manual and self-driving modes. The manual mode is used to train the model. Self-driving mode is used to drive the car automatically based on the steering angle, traffic signs, and objects. The self-driving mode is used to operate the car automatically based on the instructions of the algorithms, such as steering angle, traffic signals, and recognised objects.

**Keywords:** Embedded Systems, Machine Learning, Path Planning, Car Navigation



## Secure Database using Blockchain Driven Watermarking

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**Abstract:** Database systems are utilised in a wide range of real-world applications. Sometimes authors must outsource their databases via the Internet or another medium. The data in a relational database is first saved and then reviewed, making it vulnerable to piracy, copyright violations, and false ownership claims. Because watermarking of multimedia items is a rather developed discipline with a large body of related work, several strategies are available to efficiently deal with copyright issues of multimedia products, including cryptography, steganography, blockchain, and watermarking. The true owner of the data may be quickly and effectively recognised utilising blockchain and watermarking. While many techniques have been proposed to deal with the digital rights (or ownership rights) protection of relational databases, database researchers have recently expressed an interest in using the idea of watermarking and blockchain together for the copyright protection of relational databases. The primary function of blockchain is to add value to Internet transactions. They can also be used to timestamp digitised documents so that they cannot be tampered with. Watermarking and blockchain-based approaches can be employed for robust copyright marking, which inspired our suggested work. The reason for our suggested study is because while present techniques can defend against some attacks, they have a low chance of surviving against powerful subset attacks. Additionally, they frequently call for the involvement of a trusted third party (TTP) to resolve the issue of who owns the underlying data. Due to blockchain's ability to record time stamps and identify tampering, we are motivated to utilise it to store digital watermark information in order to address this problem. As a result, blockchain can be used to determine who watermarked the data initially and identify the true owner of the data. As a result, we use blockchains as TTP to store information like watermarks or ownership.

**Keywords:** Relational Database, Blockchain Technology, watermarking, Trusted Third Party

## BOTDET AND TAXANOMY BOTNET DETECTION

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**Abstract:** Over the past decade, the digitization of services transformed the healthcare sector leading to a sharp rise in cybersecurity threats. Poor cybersecurity in the healthcare sector, coupled with high value of patient records attracted the attention of hackers. Sophisticated advanced persistent threats and malware have significantly contributed to increasing risks to the health sector. Many recent attacks are attributed to the spread of malicious software, e.g ransomware or bot malware. Machines infected with bot malware can be used as tools for remote attack or even cryptomining. This paper presents a novel approach, called BotDet, for botnet Command and Control (C&C) traffic detection to defend against malware attacks in critical ultrastructure systems. There are two stages in the development of the proposed system:

1) we have developed four detection modules to detect different possible techniques used in botnet C&C communications and

2) we have designed a correlation framework to reduce the rate of false alarms raised by individual detection modules. Evaluation results show that BotDet balances the true positive rate and the false positive rate with 82.3% and 13.6%, respectively. Furthermore, it proves BotDet capability of real time detection.

**Keywords:** : Bot, botnet, botmaster, C&C, DNS flux, IP flux, spambot, stepping-stone, cyberwarfare, DDoS, spam, cyberfraud, fast flux service network, bot family, complex event processing..



## Facial Land Marks based Head Pose Estimation Classification

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**Abstract:** For various applications, there has been a growing interest in creating Head-Pose Estimation (HPE) approaches over the past ten years. One of them is the ability to monitor a child's head position during therapy sessions and utilise that information to operate a virtual avatar, so enhancing the children's involvement and the efficiency of the exercises. This calls for the capability of real-time, highly accurate tracking that takes into account a diverse range of tracking angles. HPE techniques can be broadly divided into appearance-based and model-based techniques. Estimating head poses can aid in bettering head pose invariance in a variety of face analysis applications or aid in comprehending human behaviour. With a number of facial landmark trackers, ready-to-use posture estimators are available, however it is not always known how accurate they are. In this research, we present a brand-new, straightforward but powerful hybrid technique for estimating the Head-Pose. It begins by recognising the face, then identifies strong feature spots on it (facial landmarks). The second part consists of applying a classification mechanism to assign facial landmarks characterising a face to a predefined range of angles representing the face orientation. The obtained results allow using the proposed approach in real-time and showed the efficiency of this approach to get significant improvement compared to the state of the art.

**Keywords:** Head Pose Estimation, facial landmarks , virtual avatar.



## Seq2seq-LSTM Deep Neural Network to Generate Worthwhile News about Disasters.

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**Abstract:** Natural disasters affect people's lives, safety, and property. The impacts of natural disasters can be reduced if the response time is improved and clear messages are received. The news media is one of the easiest ways to collect a lot of data at the data levels and the public to get information earlier than government agencies. Therefore, this research proposes a Seq2seq Long Short-Term Memory (Seq2seq-LSTM) deep neural network to provide effective news about natural disasters. The proposed model Seq2seq-LSTM is designed based on the Seq2Seq model with an attention mechanism to improve the abstract summary. Moreover, the Latent Dirichlet Allocation (LDA) topic modeling technique has been incorporated into pre-processing of data to condense the important sentences of the article. The experimental results demonstrated that the proposed model Seq2seq-LSTM has produced the highest Rouge-1 value of 29.02%, Rouge-2 value of 13.64%, and Rouge-3 value of 24.53%. The results show that the proposed model Seq2seq-LSTM neural network has generated disaster-related information effectively and explicitly as compared with other models.

**Keywords:** Natural Disaster, Disaster Prevention, Summary Generation, Deep Learning, and Natural Language Processing.



## Search in Spoken Audio From Low-Resource Indian Languages

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### Abstract

This paper presents the resources and benchmarks developed for keyword search (KWS) in spoken audio from six low-resource Indian languages (from two families), namely Gujarati, Hindi, Marathi, Odia, Tamil, and Telugu. The current work on constructing keywords and building benchmark KWS systems is inspired by the popular IARPA Babel program and the subsequent works on low-resource KWS. The keywords are constructed by taking into account their properties i.e., occurrence, length, and average confusability; and their effects on the evaluation metric - the term-weighted value (TWV). We make use of freely available speech datasets, and reprocess them to create resources for KWS, thereby adding value to the existing speech resources. Four ASR-based KWS systems are built, and their performance is analyzed across the three keyword properties on all the six languages. The prepared keywords and other related resources to replicate our experiments are made available for the public. We believe that the analysis and guidelines provided in this paper will not only help the research community, but also practitioners and engineers to easily create KWS resources for newer languages, datasets, and scenarios.

Index Terms: Keyword search; low-resource languages; term-weighted value (TWV)



## Exploration of temporal dynamics of frequency domain linear prediction cepstral coefficients for dialect classification

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### Abstract

Speakers exhibit dialectal traits in speech at sub-segmental, segmental, and supra-segmental levels. Any feature representation for dialect classification should appropriately represent these dialectal traits. Traditional segmental features such as mel-frequency cepstral coefficients (MFCCs) fail to represent sub-segmental and supra-segmental dialectal traits. This study proposes to use frequency domain linear prediction cepstral coefficients (FDLPCCs) for dialect classification inspired by its long temporal summarization during pole estimation. The i-vectors and x-vectors derived from both baseline (MFCCs, linear prediction cepstral coefficients (LPCCs), perceptual LPCCs (PLPCCs), RASTA filtered PLPCCs (PLPCC-R) and proposed (FDLPCC) features are used for identifying the dialects with support vector machine (SVM) and feed-forward neural network (FFNN) as classifiers. Proposed FDLPCC features have shown to perform better than baseline features such as MFCCs and PLPCC-Rs (best among LPCCs variants) by an absolute improvement of 3.4% and 3.9% (in unweighted average recall (UAR)), with i-vector + SVM system and 1.6% and 4.6% (in UAR), i-vector + FFNN system respectively. It is also found that there exists a complementary information between the proposed and baseline features. Furthermore current studies are compared with previous studies and it is found that performances of current studies are better than previous studies.

Index Terms: Dialect classification; Frequency domain linear prediction; i-vectors; Long temporal variations; x-vectors



## **NMF-weighted SRP for multi-speaker direction of arrival estimation: robustness to spatial aliasing while exploiting sparsity in the atom-timedomain**

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### Abstract

Localization of multiple speakers using microphone arrays remains a challenging problem, especially in the presence of noise and reverberation. State-of-the-art localization algorithms generally exploit the sparsity of speech in some representation for this purpose. Whereas the broadband approaches exploit time-domain sparsity for multi-speaker localization, narrowband approaches can additionally exploit sparsity and disjointness in the time-frequency representation. Broadband approaches are robust to spatial aliasing but do not optimally exploit the frequency domain sparsity, leading to poor localization performance for arrays with short inter-microphone distances. Narrowband approaches, on the other hand, are vulnerable to spatial aliasing, making them unsuitable for arrays with large inter-microphone spacing. Proposed here is an approach that decomposes a signal spectrum into a weighted sum of broadband spectral components (atoms) and then exploits signal sparsity in the time-atom representation for simultaneous multiple source localization. The decomposition into atoms is performed in situ using non-negative matrix factorization (NMF) of the short-term amplitude spectra and the localization estimate is obtained via a broadband steered-response power (SRP) approach for each active atom of a time frame. This SRP-NMF approach thereby combines the advantages of the narrowband and broadband approaches and performs well on the multi-speaker localization task for a broad range of inter-microphone spacings. On tests conducted on real-world data from public challenges such as SiSEC and LOCATA, and on data generated from recorded room impulse responses, the SRP-NMF approach outperforms the commonly used variants of narrowband and broadband localization approaches in terms of source detection capability and localization accuracy.

Index Terms: Direction-of-arrival; Non-negative matrix factorization; Sound source localization; Spatial aliasing; Speech sparsity



## **Implementation of a novel P&O MPPT Controller for Photovoltaic System at Standard Test Conditions**

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**Abstract.** This paper gives an ample idea of a novel P&O MPPT controller implementation to a DC-DC boost converter for a photovoltaic system at standard test conditions (STC) to track Maximum Power Point (MPP). The novel P&O MPPT controller implementation accompanies that initialization of duty cycle and calculation of power at the starting of the algorithm. Photovoltaic (PV) model is designed for lighting applications with a single diode. The PV system output is connected to a DC-DC boost converter to regulate the voltage up to a desired level. The novel P&O MPPT algorithm is implemented in a feed forward manner. The steady state condition reached at less than 0.05sec time, and tracks 10% more power at STC. The novel P&O MPPT controller results are compared with conventional P&O MPPT controller; the models are simulated in MATLAB/SIMULINK.

**Keywords:** DC DC boost converter, MPP, P&O Controller, PV, STC.



## Intrusion Detection System using AI and Machine Learning Algorithm

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**Abstract** - Secure automated threat detection and prevention is the more effective procedure to reduce the workload of analyst by scanning the network, server functions & then informs the analyst if any suspicious activity is detected in the network traffic. It monitors the system continuously and responds according to the threat environment. This response action varies from phase to phase. Here suspicious activities are detected by the help of an artificial intelligence which acts as a virtual analyst concurrently with network intrusion detection system to defend from the threat environment and taking appropriate measures with the permission of the analyst. In its final phase where packet analysis is carried out to surf for attack vectors and then categorize supervised and unsupervised data. Where the unsupervised data will be decoded or converted to supervised data with help of analyst feedback and then auto-update the algorithm (Virtual Analyst Algorithm). So that it evolves the algorithm (with Active Learning Mechanism) itself by time and become more efficient, strong. So it can able to defend form similar or same kind of attacks.

**Keywords:** Artificial Intelligence, Intrusion Detection System, Machine Learning, Network Security.



## ALL IN ONE HOME AUTOMATION

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### Abstract:

Internet Of Things (IoT) is playing a massive role as we are living in the fourth industrial revolution and making our life more comfortable and smarter than ever. One of the major sides of an IoT is the smart home. As we are living in a never-ending era of IoT, home automation leads to improving the quality of the life. Scientists have developed a new wireless internet based on harmless infrared rays that is 100 times faster than existing wi-fi network and has the capacity to support more devices without getting congested. Slow wi-fi is a source of irritation that nearly everyone experiences. Wireless devices in the home consume ever more data, and it is only growing, and congesting the wi-fi network, researchers said. Based on the present technology, in this paper introduction to an IoT-based low-cost smart home automation system that works by using the ESP32 Wi-Fi module is done. A private web server is also used for maintaining the present status of the home automation in it. The home user can access home automation services from anywhere even with IR without Wi-Fi. The paper focuses on the combination of both Wi-Fi and IR technologies implementation with Home automation.

**Keywords:** *IAQ; Home automation; wi-fi; Bluetooth; esp32; IR Remote; WIFI server; fan dimmer.*



## A Review on IoT based Indoor Air Quality Monitoring System

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**Abstract:** Systems for monitoring the quality of the air can be utilized anywhere, including in offices, homes, businesses, and mines. Because computers, laptops, and printers are used often in offices, a lot of CO<sub>2</sub> and very small amounts of other dangerous chemicals, such as CFCs, are released into the air. Gaseous poisons that kill either by displacing oxygen from the environment or by other complex mechanisms are known as asphyxiants or toxic gases. Several toxic gases, such as CO and H<sub>2</sub>S, are emitted in settings like coal mines and can be fatal with only very little exposure. They can be used in agriculture to check for dangerous particulates as well as in hospitals, ICUs, and other healthcare facilities to monitor the air for any infectious disease particles. To automatically filter the air in a space, they can be connected to equipment like air purifiers, vents, and exhaust fans. In our system, the PPM is provided by the MQ135 sensor.

**Keywords:** MQ135 Sensor, toxic gases, PPM



## Using deep convolutional neural networks and AI, a system for automatically managing attendance

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**Abstract:** The attendance of students has historically been a major concern for schools and universities, and it can be a laborious task to manually mark group activities. The current biometric group action system isn't automatic; as a result, it wastes a lot of time, is difficult to manage, and requires a line of people to have their fingerprints scanned in order to register their group action. Everybody has a smartphone in the modern era, and they are all always online. The majority of the school population will use smartphones to watch group action during this paper. Back propagation neural networks, speedier RCNNs, single-shot detectors, and region-based convolution networks are some popular object identification algorithms. Our unified framework utilises both Microsoft Azure's face API and the YOLO V3 (You Only Look Once) algorithm for face detection and face recognition (face database). The unique aspect is that a camera installed within the space can record twice, once at the start of class and once at the end, to verify that students have attended the entire session. YOLO V3 may first count the pupils in a picture before differentiating between well-known and unknown faces, creating spreadsheets on an individual basis, and sending out emails to students, parents, and colleges at the end of the month. The system is meant to work quickly for real-time implementation of enumeration and detection. Our entire system has made an effort to assemble excellent performance and face detection accuracy.

**Keywords:** YOLO V3, Temperatures Detection, Face embedding vector, SMTP, Face recognition, Facial detection, Bounding box coordinates Temperature detection.



## Design of hybrid soft computing methods for calculating the output of suspended silt in India's Godavari River

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**Abstract:** This study examines methods for predicting the production of suspended silt using soft computing (SSY). The SSY estimate is a significant issue in the management of water resources. The traditional methods for measuring the SSY take enormous amounts of time and major monetary inputs, yet they are necessary for gathering information about the mass balancing between the land and ocean. The SSY also depends on a wide range of variables, many of which have extremely complex and non-linear internal relationships. Therefore, complex nonlinear sedimentation behaviours cannot be handled by typical approaches, and reliable calculation of sediment load is also not possible. For predicting sediment yield, a genetic algorithm (GA) model based on a multilayer perceptron (MLP) artificial neural network (ANN) addresses difficult sedimentation problems. In the suggested model, the GA simultaneously optimises every model parameter for the ANN. Water discharge and water level are the input functional parameters that affect the yield of suspended sediment in the Godavari River. In this study, algorithms for estimating sediment yield based on artificial intelligence are presented for the Godavari River's Wadenpalli gauge station in India. The GA is employed to improve ANN performance in precisely calculating the SSY. For the estimation of SSY in the Godavari River, the hybrid GA based ANN (GA-ANN) has delivered the most accurate and effective results.

**Keywords:** Genetic algorithm, Suspended Sediment Yield, Artificial Neural Network, Multilayer Perceptron.



## Application of IoT in Hospital Management

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**Abstract:** This paper provides effective explications for the problems faced in general wards of hospitals with help of IoT. In hospitals, general wards are always filled with patients and busy with hectic schedules. General wards always need to be rigorous and take utmost care about patient safety. Few issues that are noticed at hospitals are a timely change of saline bottle of patient, Power consumption, and air quality issues. The issues which threaten patient safety are low air quality, fire accidents and in some rare cases, vascular air embolism occurs. Since, hospital has got a hectic schedule, unnecessary power consumption increases. To increase patient safety, sensors are incorporated with the IoT to supervise the general wards continuously. This also helps hospital staff to save time and increases their work efficiency. Integrating sensors with IoT to watch environmental conditions can prove a boon to the hospital industry because it not only enhances the patient experience but also improves the staff flow decreasing the time- consuming activities.

**Keywords:** IoT, Vascular air embolism, Arduino, PIR, Ultrasonic sensor, MQ-135 sensor.



## Home Automation Using Telegram BOT

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**Abstract:** IOT means devices or things connected over internet. With the rapid improvements in IOT heading in the direction of virtual generation wherein device to device interplay takes area with the assist of The Internet of things. The home equipment with inside the home, workplace and enterprise have become clever each day. This paper includes manipulation of home equipment the use of voice indoor, while in out of doors manipulate the use of App MQTT. In addition, the gadgets can engage and standing may be monitored and managed the use of a messaging carrier referred to as Telegram. Open supply hardware which include Raspberry Pi that is a palm PC to interface the home equipment with inside the home. To execute a home mechanization one should examine the inner parts of the equipment, which couldn't be conceivable by exclusive equipment. So this paper is an opportunity, and picked open equipment for the usage of an occurrence of uses of IOT. PI sheets are practical and simple to execute. Upon few programming guidelines, the Pi board would fill in according to the directions with the associated gadgets. This paper includes a PI board with an OS and an application called, "Telegram Bot" to send the IOT programming to detect and express the temperature and moistness of an area.

**Keywords:** App, appliances, Telegram Bot, Raspberry Pi, Home Automation.