

# **2020 IEEE Calcutta Conference (CALCON 2020)**

**Kolkata, India  
28 – 29 February 2020**



**IEEE Catalog Number: CFP20001-POD  
ISBN: 978-1-7281-5362-9**

**Copyright © 2020 by the Institute of Electrical and Electronics Engineers, Inc.  
All Rights Reserved**

*Copyright and Reprint Permissions:* Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. All rights reserved.

***\*\*\* This is a print representation of what appears in the IEEE Digital Library. Some format issues inherent in the e-media version may also appear in this print version.***

IEEE Catalog Number:	CFP20001-POD
ISBN (Print-On-Demand):	978-1-7281-5362-9
ISBN (Online):	978-1-7281-4283-8

**Additional Copies of This Publication Are Available From:**

Curran Associates, Inc  
57 Morehouse Lane  
Red Hook, NY 12571 USA  
Phone: (845) 758-0400  
Fax: (845) 758-2633  
E-mail: [curran@proceedings.com](mailto:curran@proceedings.com)  
Web: [www.proceedings.com](http://www.proceedings.com)

CURRAN ASSOCIATES INC.  
**proceedings**  
.com

## Table of Contents

Sl. No.	Paper ID	Authors' Name	Paper Title	Pages
1	8	Dipayan Guha, Provas Kumar Roy and Subrata Banerjee	Adaptive symbiotic organism search algorithm optimized 3DOF-PID controller for load frequency control of hybrid power system	1-6
2	15	Avishek Garain, Sainik Kumar Mahata and Subhabrata Dutta	Normalization of Numeronyms using NLP Techniques	7-9
3	17	Tarun Kumar Das and Sayan Chatterjee	Improved Stopband Rejection in Compact Coupled-Line Bandpass Filter by Transmission Zero Reallocation	10-14
4	19	Arijeet Ghosh, Tanmoy Kundu, Iti Saha Misra and Salil Kumar Sanyal	Role of Different Spatial Point Processes on Network Densification towards 5G Development: A Coverage and Rate Analysis	15-19
5	23	Akshaya K Pati and N C Sahoo	An Experimental Study on Energy Management of Grid-Connected Hybrid PV-Battery-Fuel Cell System	20-24
6	24	Subhashree Samal, Harish Kumar Sahoo and Madhusmita Sahoo	Realization of Adaptive Beamformer for Angle of Arrival Estimation using FPGA and Xilinx System Generator	25-29
7	26	Hmrishav Bandyopadhyay and Mita Nasipuri	Segmentation of Pap Smear images for Cervical Cancer detection	30-33
8	27	Sk. Intiaj, Sandipan Bhattacharya, Ayon Seal and Iti Saha Misra	An Experimental Approach Towards Adaptive Beam-Shaping using SMI Algorithm in Indoor Fading Environment	34-38
9	28	Anupam Pattanayak and Subhasish Dhal	A Study on Reversible Rules of Probabilistic Cellular Automata	39-44
10	31	Debasis Acharya, Dushmanta Kumar Das and Abhishek Srivastava	A new Quantum-class topper optimization based fractional order proportional integral power system stabilizer design to damp out low frequency oscillations in power systems	45-49
11	35	Madhusmita Sahoo and Harish Kumar Sahoo	Robust Variable Power Fractional LMP Based Channel Estimation For MIMO Fading Wireless Systems	50-53
12	38	Ritam Guha, Kushal Kanti Ghosh, Showmik Bhowmik and Ram Sarkar	Mutually Informed Correlation Coefficient (MICC) – a new Filter based Feature Selection method	54-58
13	39	Sudipta Dey and Iti Saha Misra	Content Driven Proportionate Channel Allocation Scheme for Scalable Video over Cognitive Radio Network	59-63
14	40	Shubhranshu Kumar Tiwary, Jagadish Pal and Chandan Kumar Chanda	Multi-dimensional ANN application for Active Power Flow State classification on a Utility System	64-68
15	42	Sudipta Dey and Iti Saha Misra	Modeling of an Efficient Sensing Strategy for Real Time Video Communication over Cognitive Radio Network	69-73

## Table of Contents

Sl. No.	Paper ID	Authors' Name	Paper Title	Pages
16	44	Aritra Mukherjee, Soumik Sarkar and Sanjoy Kumar Saha	Object Mapping from Disparity Map by Fast Clustering	74-79
17	47	Archan Bhattacharya, Soham Roy, Navonil Sarkar and Samir Malakar	Circuit component detection in offline hand-drawn electrical/electronic circuit diagram	80-84
18	50	Agniv Adhikari and Abhik Mukherjee	Citation convergence of academic conference papers	85-88
19	52	Arka Bhattacharya, Amartya Banerjee, Sayan Chatterjee and Bhaskar Gupta	Dual-Band Minkowski Fractal Patch Antenna With Polarization Diversity	89-92
20	55	Dhruba Das, Bijit Biswas, G. Arun Kumar and Sibabrata Mondal	A Compact Very Narrow Band Coaxial Cavity Resonator Filter at X-band with SMA Connector Feed	93-96
21	56	Sohini Banerjee, Malay Gangopadhyay, Amartya Banerjee and Sayan Chatterjee	Investigations on the Radiation Characteristics of a CPW-Fed Yagi-Inspired Strip Monopole Antenna	97-101
22	57	G.P.V.Y. Nikhil, Chinmay Dimri, P.K. Mohanty, R. Saha and S. Routray	High-k Dielectrics on 20nm FDSOI FinFET: Study on Analog and RF Performance	102-105
23	61	Sanghamitra De, Mridul Sankar Barik and Indrajit Banerjee	A Digital Forensic Process Model for Cloud Computing	106-110
24	62	Debasis Tripathy, N.B. Dev Choudhury, Sadasiva Behera and Binod Kumar Sahu	Grasshopper Optimization Algorithm based Fuzzy PD-PI Cascade Controller for LFC of Interconnected Power System Coordinate with Renewable Sources	111-116
25	63	Radhe Gobinda Debnath and Srimanta Baishya	Impact of Dielectric Pocket on the Performance of Double Gate TFET	117-121
26	70	Krishnendu Mukhopadhyay, Rajarshi Bose, Anwit Mondal, Suman Kumar Bera, Showmik Bhowmik and Ram Sarkar	Removal of Salt and Pepper Noise: a Game Theoretic Approach	122-126
27	72	Dibyadip Chatterjee, Charu Arora, Saurajit Chakraborty and Sanjoy Kumar Saha	Human Activity Recognition based on Summarized Semi-detailed Frame Information and Contextual Features	127-131
28	73	Ardhendu Kundu, Kaushik Patra, Bhaskar Gupta and Amirul Mallick	Role of Reverberation Chamber in Wireless Testing and Measurement with emphasis on Investigating Biological Effects	132-136
29	75	Arnab Maity and Iti Saha Misra	Prototype Design of An IoT Enabled Cost Efficient Portable Heart-Health Data Acquisition System	137-141
30	76	Ananda Chatterjee, Saurabh Pal and Madhuchhanda Mitra	PTT Based Portable Cuffless Systolic Blood Pressure Estimation	142-147

## Table of Contents

Sl. No.	Paper ID	Authors' Name	Paper Title	Pages
31	82	Rajarshi Dhar, S.J. Mukhopadhyay and M. Mitra	A Study on the Noise Performance of an Si based IMPATT Device for different Junction Temperature	148-151
32	84	Sumit Misra, Dipan Biswas, Sanjoy Kumar Saha and Chandan Mazumdar	Applying Fourier Inspired Windows for Concept Drift Detection in Data Stream	152-156
33	86	Ayon Seal, Sandipan Bhattacharya and Iti Saha Misra	QoS Analysis with Coverage, Speed and Resources on Small Cells Cellular Networks	157-161
34	87	Saurav Chanda, Koushik Guha, Santu Patra, Loukrakpam Merin Singh, Krishna Lal Baishnab and Prashanta Kumar Paul	An Energy Efficient 32 Bit Approximate Dadda Multiplier	162-165
35	91	Sayani Chatterjee, Debranj Mukherjee and Debaprasad Kasta	Loss Comparison of Various Unidirectional Rectifiers for Medium Voltage Applications	166-170
36	94	Rajeev Ranjan Pathak and Anindita Sengupta	Harmony Search based Adaptive Sliding Mode Control for Inverted Pendulum	171-175
37	95	Abhishek Chakraborty, Deboleena Sadhukhan and Madhuchhanda Mitra	A Robust PPG Onset and Systolic Peak Detection Algorithm Based On Hilbert Transform	176-180
38	96	Souma Guha Mallick, Bijit Biswas, Sayan Chatterjee, G. Arun Kumar and D.R. Poddar	A Multilayered Transition between SIW and ESIW	181-183
39	97	Subhrapatim Nath, Rabiraj Bandyopadhyay, Saptarshi Biswas, Jamuna Kanta Sing and Subir Kumar Sarkar	A New Global Routing Optimization Algorithm based on Pigeon Inspired Optimization	184-188
40	98	SK Intiaj and Sandipan Bhattacharya	Performance Comparison Between $2 \times 1$ and $2 \times 2$ Corporate Feed Antenna Array in X-band	189-193
41	101	Avishek Munsu, Piyal Pal and Sumana Chowdhuri	An Efficient G2V and V2G Converter Systems for EV Application	194-199
42	106	Nazma Hayat, Sriparna Roy Ghatak, Samita Rani Pani and Smaranika Mishra	Performance Improvement of Three Phase Unbalance Distribution System Using DG and DSTATCOM	200-205
43	108	Sayani Chatterjee, Ashesh Mandal, Suvarun Dalapati, Pabitra Haldar and Kaushik Mukherjee	Design, Simulation & Thermal Analysis of an Interior Permanent Magnet Synchronous Motor for A Fork-lift Truck Application	206-211
44	109	Mukesh Kumar and Shaik Affijulla	Estimation of Alternator Rotor Angle by using Synchronized Voltage and Current Phasors	212-216
45	111	Jeet Banerjee, Suvajit Mallick and Rowdra Ghatak	A Multi-functional Diversity Antenna with High Wideband Isolation	217-220

## Table of Contents

Sl. No.	Paper ID	Authors' Name	Paper Title	Pages
46	112	Dibyendu Sur, Jasmine Firdaus, Trisha Paul, Raktima Dutta and Chaitali Bhattacharyya	Response of Equatorial Ionization in Indian Longitudes to HSSW Driven Geomagnetic Storm	221-224
47	113	Sreya Ghosh and Iti Saha Misra	Controlled Speed Limiting System for Congestion Mitigation for Smart City Design	225-229
48	114	Shreya Ghosal and Kamal Sarkar	Rice Leaf Disease Classification using CNN with Transfer Learning	230-235
49	115	Meenakshi Chakraborty and Tarapasrad Chattopadhyay	Reduction of Frequency Chirp in Fabry-Perot Semiconductor Laser Under Low Level Optical Injection	237-239
50	117	Nibedita Mukherjee, Ardhendu Kundu, Bhaskar Gupta and Monojit Mitra	Specific Absorption Rate Estimation for a Typical Hibiscus Flower Model as per ICNIRP Electromagnetic Guidelines	240-243
51	120	Anindita Mondal, Sneha Ghosh, Akash Roy, Mousiki Kar and Atanu Kundu	Effect of Doped AlGaN Width Variation on Analog Performance of Dual Gate Underlap MOS-HEMT	244-247
52	121	Basudeb Das, Tapas Maity and Saswati Mazumdar	Indoor Optical Intercom System: Application of Visible Light Communication system for audio transmission using PDM	248-252
53	123	Leimapokpam Vidyaratana Meetei and Dushmanta Kumar Das	Fully Active Suspension Design using Super Twisting Sliding Mode Control based on Disturbance Observer and Ensemble Kalman Filter	253-257
54	125	Soham Dey, Jayati Dey and Subrata Banerjee	Optimization Algorithm Based PID Controller Design for a Magnetic Levitation System	258-262
55	126	Susmita Adhikary, Debashis Chatterjee and Krishnendu Chakrabarty	Control of Bifurcation in a PWM Controlled dc Series Motor Drive	263-267
56	127	Tanmoy Kundu, Arijeet Ghosh, Iti Saha Misra and Salil Kumar Sanyal	Kaiser Window Based Side Lobe Level Suppression in 3D Beam forming for Massive MIMO Structure	268-272
57	128	Niraj Rana, Jayati Dey and Subrata Banerjee	An Improved Buck-Boost Converter Suitable for PV Application	273-277
58	129	Ajila T Yimchunger, Debasis Acharya and Dushmanta Kumar Das	Particle Swarm Optimization based PID-Controller Design for Volume Control of Artificial Ventilation System	278-282
59	130	Aritra Mukherjee, Prithwish Jana, Sayak Chakraborty and Sanjoy Kumar Saha	Two Stage Semantic Segmentation by SEEDS and Fork Net	283-287
60	132	Debarpan Bhattacharya, Pranabendra Prasad Chandra, Biswajit Bhattacharya and Sugata Munshi	Optimized Thermocouple Temperature Sensor using 555 Timer and ANN Based Linearization	288-291

**Table of Contents**

<b>Sl. No.</b>	<b>Paper ID</b>	<b>Authors' Name</b>	<b>Paper Title</b>	<b>Pages</b>
61	135	Soumen Mondal, Sanjay Dharroy and Sumit Kundu	Outage Analysis in Dual Hop Relay Network with an Adaptive Energy Harvesting Scheme	292-296
62	136	Dipankar Chatterjee and Suvarun Dalapati	Single-Phase Average Power Measurement Using Instantaneous Power Theory in a Fixed Point Processor	297-301
63	138	Srinivasulu G, N C Sahoo and Balakrishna P	Comparative Analysis of Different Types of Power Transactions in Smart Grid	302-307
64	140	Chidurala Saiprakash, Alivarani Mohapatra, Byamakesh Nayak and Sriparna Roy Ghatak	Performance Enhancement of PV Array under Partial Shading Condition by Modified BL Configuration.	308-312
65	141	Tishya Sarma Sarkar, Bappaditya Sinha, Shibabrata Mukherjee, Indranuj Joardar and Saswati Mazumdar	Development of an FPGA based Indoor Free Space Optical (FSO) Communication System using 808 nm Infrared (IR) LASER Source	313-317
66	142	Dipannita Ghosh, Amish Kumar, Palash Ghosal, Tamal Chowdhury, Anup Sadhu and Debashis Nandi	Breast Lesion Segmentation in Ultrasound Images Using Deep Convolutional Neural Networks	318-322
67	143	Subhashree Choudhury, Nikhil Khandelwal, Ankit Kumar, Anshika Shukla, Anshu Jha, Monalisa Mohanty and Tarapasanna Dash	A Supervisory State of Charge and State of Power Management Control Strategy among Hybrid Energy Storage Systems through Thermal Exchange Optimization Technique	323-327
68	144	Jeet Banerjee, Sumit Bhattacharya, Arjyaman Choudhury, Anushka Biswas, Rupam Paul, Anirban Dutta and Rowdra Ghatak	An Orthogonally Oriented Multiband MIMO Antenna for WLAN, C-Band and X-Band Wireless Applications	328-332
69	148	Nayan Manna, Ayandeep Ganguly and Dr. Arindam Kumar Sil	A Critical Analysis for Microgrid Formation based on Hourly Load Growth and Available Renewable Energy	333-337
70	150	Bijit Kumar Das and Arpan Mukherjee,	Improved Sparsity Aware Collaborative Spectrum Estimation for Small Cell Networks	338-341
71	151	Subhajit Bhowmick, Palash Kumar Kundu and Dharma Das Mandal	HRV Performance Analysis in Photoplethysmography and Electrocardiography	342-345
72	152	Souptik Barman, Ayan Biswas and Anindita Kundu	Analysis of a Dynamic Queuing Model for Secondary Users in Cognitive Radio Networks	346-350
73	153	Sandeep Kumar Chawrasia, Chandan Kumar Chanda and Sumit Banerjee	Design and analysis of In-Wheel Motor for an Electric vehicle	351-355
74	155	A. Chakrabarty, R. Swain and A.K. Panda	Fin Width dependent Threshold Voltage Modeling in AlGaIn/GaN Fin shaped nano channel HEMT	356-358
75	156	Ashmita Dey and Ujjwal Maulik	Identification of Cell-types based on the Pathway of Markers using Single-cell data	359-362

## Table of Contents

Sl. No.	Paper ID	Authors' Name	Paper Title	Pages
76	158	Anindita Kundu, Sumanta Banerje, Chittabarni Sarkar and Souptik Barman	An Axis Based Mean Filter for Removing High-Intensity Salt and Pepper Noise	363-367
77	160	Tapas Kumar Mishra, Jayadeep Sadhu and Arun Kumar	Boundary Detection in Dynamic Wireless Sensor Networks using Convex Hull Techniques	368-372
78	162	Dhruba Kumar and Partha Sarathee Bhowmik	Genetic Algorithm-based Optimal Placement of STATCOM in Pre-islanding and Post-islanding Condition	373-377
79	163	Shubham Kumar, Minnat Ali, Raushan Kumar, Rajrup Mitra, Atanu Kundu and Mousiki Kar	Impact of Source and Drain Underlap on Analog Performance of Double-Gate AlGaIn/GaN MOS-HEMT	378-381
80	164	Jayanta Bhattacharya and Sudipta Maity	A Comparative study between Rectangular, Circular and Annular Ring Shaped Microstrip Antennas	382-385
81	165	Prashant Choudhary and Jitendra Nath Bera	SMS Based Load Flow Monitoring and Analysis for Theft Location Detection in Rural Distribution Systems	386-390
82	169	Nupur and Shabari Nath	Effect of Shifting Gate Pulse on Output Voltage Ripple in Coupled SIDO Boost Converter	391-395
83	174	Sannistha Banerjee and Partha Sarathee Bhowmik	Transient Disturbances and Islanding Detection in Micro Grid using Discrete Wavelet Transform	396-401
84	175	Ayandeep Ganguly, Kuheli Goswami and De. Arindam Kumar Sil	WANN and ANN based Urban Load Forecasting for Peak Load Management	402-406
85	177	Imran Alam, Devesh Jalan, Priti Shaw and Partha Pratim Mohanta	Motion Based Video Skimming	407-411
86	178	Hrit Mukherjee, Rajanya Dasgupta, Mousiki Kar and Atanu Kundu	A Comparative Analysis of Analog Performance of Underlapped Dual Gate AlGaIn/GaN based MOS-HEMT and Schottky-HEMT	412-416
87	180	Chandan Jana, Mousumi Jana Bala and Swapan Kumar Goswami	Finding of the Probable Size and Location of Distributed Generation in Unbalanced Distribution System with Demand Uncertainty	417-420
88	182	Debanshu Banerjee, Pratik Bhowal, Suman Kumar Bera and Ram Sarkar	Rectification of Camera Captured Document Images using Component Analysis	421-425
89	183	Upayan Chatterjee, Ananya Pal, Atanu Kundu and Mousiki Kar	Influence of GaN layer width to AlGaIn layer width Ratio on Analog Performance Enhancement of an Underlap DG AlGaIn/GaN based MOS-HEMT Device	426-430
90	185	Biswajit Debnath, Ankita Das, Sanchari Das and Abhijit Das	Studies on Security Threats in Waste Mobile Phone Recycling Supply Chain in India	431-434
91	186	Ujjal Sur, Amitava Biswas, Jitendra Nath Bera and Gautam Sarkar	Holomorphic Embedding Load Flow Modelling of DSTATCOM for Active Distribution Networks	435-438



## Table of Contents

Sl. No.	Paper ID	Authors' Name	Paper Title	Pages
92	187	Subham Kundu and Kaushik Patra	Design of Reconfigurable Planar Yagi-Uda Antenna for Dual Frequency Wireless Communication	439-443
93	188	Sumanta Mukherjee and Kamal Sarkar	Analyzing Large News Corpus Using Text Mining Techniques for Recognizing High Crime Prone Areas	444-450
94	193	Aritra Dey, Shyamali Mitra and Nibaran Das	Handwritten Tibetan Character Recognition Based on ELM using Modified HOG Features	451-456
95	194	Arpan Banerji, Reetwik Bhadra, Ayan Banerji, Ambarnath Banerji and Sujit K. Biswas	A Renewable Energy Based Hybrid Autonomous Grid	457-461
96	195	Vishwanath Gupta, Biswarup Basak and Biswanath Roy	A Fault-Detecting and Motion-Sensing Wireless Light Controller for LED Lighting System	462-466
97	196	Sourav Das, Aniruddha Bhattacharya and Parimal Acharjee	Charging Scheduling of Electric Vehicles (EV) in Probabilistic Scenario considering Grid-to-Vehicle (G2V) and Vehicle-to-Grid (V2G)	467-472
98	197	Sayan Seal, Prasun Chail, Souvik Roy and Abhik Mukherjee	Exploring the fractal nature in dynamics of crimes during recent Lok Sabha elections in West Bengal	473-477
99	199	Sonali Basak, Santu Sarkar and N. R Das	Modes and Coupling in Six-Core hole-walled Optical Fiber	478-481
100	200	Sanjib Mitra and Dr. Santu Sarkar	Location sensing of wheel based movable object with low cost sensors in GPS denied environment	482-485
101	201	Soumya Ghorai, Deepanjan Majumdar, Tushar Jash and Susanta Ray	PV assisted Fuzzy based EV charge scheduling for demand side energy management: a case study	486-492
102	202	Soumya Ghorai and Susanta Ray	Revisiting small signal analysis techniques on a two area four machine power system network	493-496
103	204	Anirban Chatterjee, Sindhunil Bhaumik, Anisha Naskar, Nikhil Mondal, Debashis Chatterjee and Susanta Ray	A Transformer-less Grid Interactive Converter Topology for PV Based Micro Generator	497-501
104	205	Arnab Das and Susanta Ray	A Review on Diagnostic Techniques of Bearing Fault and its modeling in Induction Motor	502-505
105	206	Sindhura Gupta, Susovan Mukhopadhyay, Ambarnath Banerji and Sujit K. Biswas	Dynamic and Transient State Analysis of Islanded Microgrid	506-510
106	207	Amitava Halder, Saptarshi Chatterjee and Debangshu Dey	Superpixel and Density Based Region Segmentation Algorithm for Lung Nodule Detection	511-515
107	209	Archak Sadhukhan, Pritam Kumar Gayen and Shib Sankar Saha	Maximum Power Point Tracking of SPV Array for Phase Shifted PWM DC-DC Converter	516-520
108	210	Sukanya Dasgupta and Sujit K. Biswas	Three-phase Sine Wave Inverter using Natural Harmonic Compensation	521-525