

# **2020 National Conference on Communications (NCC 2020)**

**Kharagpur, India  
21 – 23 February 2020**



**IEEE Catalog Number: CFP2042J-POD**  
**ISBN: 978-1-7281-5121-2**

**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:	CFP2042J-POD
ISBN (Print-On-Demand):	978-1-7281-5121-2
ISBN (Online):	978-1-7281-5120-5

**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

<b>FORENSIC DETECTION OF MEDIAN FILTERING IN IMAGES USING LOCAL TETRA PATTERNS AND J-DIVERGENCE .....</b>	<b>1</b>
<i>Udayeni Anumala ; Manish Okade</i>	
<b>EFFECT OF GAUSSIAN CORRELATED CHANNEL ON UPLINK CHANNEL ESTIMATION FOR MASSIVE MIMO WITH NESTED ARRAY AT THE BASE STATION.....</b>	<b>7</b>
<i>Md Afaque Azam ; Anirban Mukherjee ; Amit Kumar Dutta</i>	
<b>FRONTAL FACIAL EXPRESSION RECOGNITION USING PARALLEL CNN MODEL .....</b>	<b>13</b>
<i>Sagar Deep Deb ; Chandraitit Choudhury ; Manish Sharma ; Fazal Ahmed Talukdar ; Rabul Hussain Laskar</i>	
<b>OCULAR ARTIFACT ELIMINATION FROM EEG SIGNALS USING RVFF-RLS ADAPTIVE ALGORITHM.....</b>	<b>18</b>
<i>Sridhar Chintala ; Jaisingh Thangaraj</i>	
<b>INTERNET OF THINGS-ENABLED OVERLAY SATELLITE-TERRESTRIAL NETWORKS IN THE PRESENCE OF INTERFERENCE.....</b>	<b>24</b>
<i>Pankaj K. Sharma ; Budharam Yogesh ; Deepika Gupta</i>	
<b>INVESTIGATING TARGET SET REDUCTION FOR END-TO-END SPEECH RECOGNITION OF HINDI-ENGLISH CODE-SWITCHING DATA .....</b>	<b>30</b>
<i>Kunal Dhawan ; Ganji Sreeram ; Kumar Priyadarshi ; Rohit Sinha</i>	
<b>MULTILINGUAL SPEECH MODE CLASSIFICATION MODEL FOR INDIAN LANGUAGES.....</b>	<b>35</b>
<i>Kumud Tripathi ; K. Sreenivasa Rao</i>	
<b>SUBSTATE DETECTION BASED CONFIDENCE SCORING IN SPEECH RECOGNITION.....</b>	<b>41</b>
<i>A K Punnoose</i>	
<b>GENERALIZED FRACTIONAL MATCHED FILTERING AND ITS APPLICATIONS.....</b>	<b>46</b>
<i>Peeyush Sahay ; Ameya Anjarlekar ; Shubham Anand Jain ; P. Radhakrishna ; Vikram M. Gadre</i>	
<b>AN EFFICIENT FPGA IMPLEMENTATION OF TURBO PRODUCT CODE DECODER WITH SINGLE AND DOUBLE ERROR CORRECTION .....</b>	<b>52</b>
<i>Nitin Nageen ; Subhashini ; Vikas Bhatia</i>	
<b>APPLICATION OF KOHONEN-SELF ORGANIZING MAP TO CLUSTER DRUG INDUCED CA<sup>2+</sup> RESPONSE IN HIPPOCAMPAL NEURONS AT DIFFERENT DRUG DOSE .....</b>	<b>58</b>
<i>Abha Saxena ; Vaibhav Dhyani ; Soumya Jana ; Lopamudra Giri</i>	
<b>STPM BASED PERFORMANCE ANALYSIS OF FINITE-SIZED DIFFERENTIAL SERIAL FSO NETWORK.....</b>	<b>64</b>
<i>Deepti Agarwal ; Ankur Bansal</i>	
<b>BLOCK-SPARSITY-INDUCED SYSTEM IDENTIFICATION USING EFFICIENT ADAPTIVE FILTERING.....</b>	<b>70</b>
<i>Bijit Kumar Das ; Arpan Mukherjee ; Mrityunjoy Chakraborty</i>	
<b>A FUSION-BASED APPROACH TO IDENTIFY THE PHASES OF THE SIT-TO-STAND TEST IN OLDER PEOPLE .....</b>	<b>76</b>
<i>Brajesh K. Shukla ; Hiteshi Jain ; Vivek Vijay ; Sandeep Yadav ; David Hewson</i>	
<b>BINAURAL SPATIAL AUDIOMETRY SCREENING USING ANDROID MOBILE DEVICE AUDIO I/O FACILITY .....</b>	<b>82</b>
<i>S Arthi ; T V Sreenivas</i>	
<b>UNIFORMLY MOST POWERFUL CFAR TEST FOR PARETO-TARGET DETECTION IN PARETO DISTRIBUTED CLUTTER .....</b>	<b>88</b>
<i>John Bob Gali ; Priyadip Ray ; Goutam Das</i>	
<b>DESIGN AND DEVELOPMENT OF 6 DB MICROSTRIP DIRECTIONAL COUPLER AT C-BAND USING DEFECTIVE GROUND FOR TRACKING APPLICATION .....</b>	<b>94</b>
<i>Nupur Sood ; Umesh Bahuguna ; Pinaki Sen</i>	
<b>EFFECTIVE COMBINATION OF MULTIPLE EVIDENCES FOR I-VECTOR BASED LIMITED DATA SPEAKER VERIFICATION.....</b>	<b>99</b>
<i>Krishna Dutta ; Debadatta Pati</i>	
<b>PERFORMANCE OF SPATIALLY COUPLED LDPC CODES OVER UNDERWATER ACOUSTIC COMMUNICATION CHANNEL.....</b>	<b>104</b>
<i>Sravan Kumar Padala ; John D'Souza</i>	
<b>NETWORK CODING ASSISTED RELIABLE MULTICASTING IN MULTI-HOP WIRELESS NETWORKS WITH TWO-SOURCES.....</b>	<b>109</b>
<i>Prateek Rathore ; Kalpana Dhaka ; Sanjay K. Bose</i>	

<b>SUBPACKETIZATION IN CODED CACHING WITH DEMAND PRIVACY</b> .....	115
<i>V R Aravind ; Pradeep Kiran Sarvepalli ; Andrew Thangaraj</i>	
<b>BSBL-BASED BLOCK-SPARSE CHANNEL ESTIMATION FOR AFFINE PRECODED OSTBC MIMO-OFDM SYSTEMS</b> .....	121
<i>Suraj Srivastava ; Manoj P. Suradkar ; Aditya K. Jagannatham</i>	
<b>SUPERIMPOSED PILOTS BASED ADAPTIVE TIME-SELECTIVE CHANNEL ESTIMATION IN MU-MIMO SYSTEMS</b> .....	127
<i>Vikram Singh ; Suraj Srivastava ; Aditya K. Jagannatham</i>	
<b>A COMPARATIVE ANALYSIS BETWEEN CIRCUIT ANALOG AND CAPACITIVE CIRCUIT BASED BROADBAND ABSORBERS</b> .....	133
<i>Gaurav Singh ; Saptarshi Ghosh</i>	
<b>A POLARIZATION-INDEPENDENT FREQUENCY SELECTIVE SURFACE BASED SWITCHABLE ABSORBER / RASORBER</b> .....	138
<i>Vishal Rathore ; Saptarshi Ghosh</i>	
<b>AVERAGE RATE OF OPTIMAL INCREMENTAL RELAYING WITH SELECTION: ANALYSIS AND INSIGHTS</b> .....	143
<i>Priyanka Das</i>	
<b>OUTAGE PERFORMANCE OF COGNITIVE RELAY NETWORKS WITH OPTIMAL RELAY AND ANTENNA SELECTION</b> .....	149
<i>Priyanka Das</i>	
<b>ADAPTIVE ENERGY HARVESTING WITH RELAY SELECTION SCHEMES IN AN ORDERED NOMA NETWORK</b> .....	155
<i>Soumen Mondal ; Sanjay Dharroy ; Sumit Kundu</i>	
<b>NOISY DELETION, MARKOV CODES AND DEEP DECODING</b> .....	161
<i>Avijit Mandal ; Avhishek Chatterjee ; Andrew Thangaraj</i>	
<b>IITG- INDIGO SUBMISSIONS FOR NIST 2018 SPEAKER RECOGNITION EVALUATION AND POST-CHALLENGE IMPROVEMENTS</b> .....	167
<i>Kamalesh Singh ; Nagendra Kumar ; Rohit Sinha ; Shreyas Ramoji ; Sriram Ganapathy</i>	
<b>THROUGHPUT OF AN ENERGY-HARVESTING UAV ASSISTED COGNITIVE RADIO NETWORK</b> .....	172
<i>Abhijit Bhowmick ; Sanjay Dhar Roy ; Sumit Kundu</i>	
<b>BLIND CHANNEL CODING IDENTIFICATION OF CONVOLUTIONAL ENCODER AND REED-SOLOMON ENCODER USING NEURAL NETWORKS</b> .....	178
<i>Naveenta Gautam ; Brejesh Lall</i>	
<b>RLS-BASED ADAPTIVE TIME-VARYING RCS ESTIMATION AND IMAGING IN MIMO RADAR SYSTEMS</b> .....	184
<i>Archana Rawat ; Saumya Dwivedi ; Suraj Srivastava ; Aditya K. Jagannatham</i>	
<b>ON MULTI RF CHAIN TIME SUCCESSIVE SSK-M-ARY MODULATION TRANSMITTER</b> .....	190
<i>P. Maheswaran ; M. D. Selvarai</i>	
<b>LOW-RANK KERNELIZED GRAPH-BASED CLUSTERING USING MULTIPLE VIEWS</b> .....	196
<i>Supratim Manna ; Jessy Rimaya Khonglah ; Anirban Mukherjee ; Goutam Saha</i>	
<b>MIC-GAN: MULTI-VIEW ASSISTED IMAGE COMPLETION USING CONDITIONAL GENERATIVE ADVERSARIAL NETWORKS</b> .....	202
<i>Gagan Kanojia ; Shanmuganathan Raman</i>	
<b>ANALYSIS OF EXCITATION SOURCE CHARACTERISTICS FOR SHOUTED AND NORMAL SPEECH CLASSIFICATION</b> .....	208
<i>Shikha Baghel ; S. R. Mahadeva Prasanna ; Prithwijit Guha</i>	
<b>P300 BASED STEREO LOCALIZATION OF SINGLE FREQUENCY AUDIO STIMULUS</b> .....	214
<i>Sidharth Aggarwal ; Rini Sharon ; Hema A. Murthy</i>	
<b>ERROR PERFORMANCE OF OTFS IN THE PRESENCE OF IQI AND PA NONLINEARITY</b> .....	219
<i>Sapta Girish Neelam ; P. R. Sahu</i>	
<b>NON-UNIFORM AMPLITUDE CODEBOOKS FOR MU-MIMO IN MILLIMETER WAVE SYSTEMS</b> .....	225
<i>Silpa S. Nair ; Srikrishna Bhashyam</i>	
<b>SECURITY AT PHYSICAL LAYER IN NOMA WITH COOPERATIVE JAMMING</b> .....	231
<i>Shashibhushan Sharma ; Sanjay Dhar Roy ; Sumit Kundu</i>	
<b>OUTAGE ANALYSIS OF ADAPTIVE COMBINING SCHEME FOR HYBRID FSO/RF COMMUNICATION</b> .....	237
<i>Mokkapatil Siddharth ; Suyash Shah ; Swaminathan R</i>	
<b>A NOVEL NOMA SCHEME FOR UPLINK HETEROGENEOUS NETWORK USING QR DECOMPOSITION-BASED PROJECTION</b> .....	243
<i>C. P. Najlah ; S. M. Sameer</i>	

<b>ON THE POLARIZING BEHAVIOR AND SCALING EXPONENT OF POLAR CODES WITH PRODUCT KERNELS.....</b>	<b>248</b>
<i>Manan Bhandari ; Ishan Bansal ; V. Lalitha</i>	
<b>PERFORMANCE ANALYSIS OF COOPERATIVE NLOS UVC SYSTEM WITH RECEIVER DIVERSITY.....</b>	<b>254</b>
<i>Kamal K. Garg ; Vimal Bhatia</i>	
<b>ABEP OF SSK WITH SWIPT AT RELAY AND GENERALISED SELECTION COMBINING AT THE DESTINATION OVER RAYLEIGH FADING.....</b>	<b>260</b>
<i>Hemanta Kumar Sahu ; P. R. Sahu ; J. Mishra</i>	
<b>EDGE NODES PLACEMENT IN 5G ENABLED URBAN VEHICULAR NETWORKS: A CENTRALITY-BASED APPROACH.....</b>	<b>266</b>
<i>Moyukh Laha ; Suraj Kamble ; Raja Datta</i>	
<b>PERFORMANCE ANALYSIS OF A LI-FI SYSTEM UNDER AMBIENT LIGHT CONDITIONS.....</b>	<b>272</b>
<i>Jayashree Pradhan ; Vinod Kiran Kappala ; Santos Kumar Das</i>	
<b>A TFIDFVECTORIZER AND SVM BASED SENTIMENT ANALYSIS FRAMEWORK FOR TEXT DATA CORPUS.....</b>	<b>278</b>
<i>Vipin Kumar ; Basant Subba</i>	
<b>A TWO-WAY OPTIMIZATION FRAMEWORK FOR CLUSTERING OF IMAGES USING WEIGHTED TENSOR NUCLEAR NORM APPROXIMATION.....</b>	<b>284</b>
<i>Akhil Johnson ; Jobin Francis ; Baburaj Madathil ; Sudhish N George</i>	
<b>EVALUATING THE IMPACT OF REGION BASED CONTENT POPULARITY OF VIDEOS ON THE COST OF CDN DEPLOYMENT.....</b>	<b>289</b>
<i>Prateek Yadav ; Subrat Kar</i>	
<b>CLASSIFYING SPEECH OF ASD AFFECTED AND NORMAL CHILDREN USING ACOUSTIC FEATURES.....</b>	<b>295</b>
<i>Abhijit Mohanta ; Vinay Kumar Mittal</i>	
<b>INDEX CODES WITH MINIMUM LOCALITY FOR THREE RECEIVER UNICAST PROBLEMS.....</b>	<b>301</b>
<i>Smiju Kodanthuruthil Joy ; Lakshmi Natarajan</i>	
<b>ON PERFORMANCE OF SWIPT ENABLED TWO-WAY RELAY SYSTEM WITH NON-LINEAR POWER AMPLIFIER.....</b>	<b>307</b>
<i>Shaik Parvez ; Deepak Kumar ; Vimal Bhatia</i>	
<b>EXPLOITING LOW RANK PRIOR FOR DEPTH MAP COMPLETION.....</b>	<b>313</b>
<i>Sukla Satapathy ; Rajiv Ranjan Sahay</i>	
<b>TWIN DEEP CONVOLUTIONAL NEURAL NETWORK-BASED CROSS-SPECTRAL PERIODICULAR RECOGNITION.....</b>	<b>319</b>
<i>Sushree S. Behera ; Bappaditya Mandal ; Niladri B. Puhan</i>	
<b>SEMANTIC SEGMENTATION BASED HAND GESTURE RECOGNITION USING DEEP NEURAL NETWORKS.....</b>	<b>325</b>
<i>H Pallab Jyoti Dutta ; Debajit Sarma ; M. K. Bhuyan ; R. H. Laskar</i>	
<b>KERNELIZED GRAPH-BASED MULTI-VIEW CLUSTERING ON HIGH DIMENSIONAL DATA.....</b>	<b>331</b>
<i>Supratim Manna ; Jessy Rimaya Khonglah ; Anirban Mukherjee ; Goutam Saha</i>	
<b>UNDERWATER IMAGE RECOGNITION DETECTOR USING DEEP CONVNET.....</b>	<b>337</b>
<i>M Dhana Lakshmi ; Sakthivel Murugan Santhanam</i>	
<b>SELF ATTENTIVE CONTEXT DEPENDENT SPEAKER EMBEDDING FOR SPEAKER VERIFICATION.....</b>	<b>343</b>
<i>Sreekanth Sankala ; B. Shaik Mohammad Rafi ; Sri Rama Murty Kodukula</i>	
<b>COMMUNICATING WITH A STRATEGIC SENDER.....</b>	<b>348</b>
<i>Anuj S. Vora ; Ankur A. Kulkarni</i>	
<b>DENSE LAYER DROPOUT BASED CNN ARCHITECTURE FOR AUTOMATIC MODULATION CLASSIFICATION.....</b>	<b>354</b>
<i>P Dileep ; Dibyajyoti Das ; Prabin Kumar Bora</i>	
<b>DESIGN OF A MODIFIED INSCRIBED SQUARE FRACTAL ANTENNA FOR WIDEBAND WIRELESS APPLICATIONS.....</b>	<b>359</b>
<i>Tanmaya Kumar Das ; Rupa Samyuktha Kotla ; Santanu Kumar Behera</i>	
<b>SIMULTANEOUS MEASUREMENT OF ATMOSPHERIC TURBULENCE INDUCED INTENSITY AND POLARIZATION FLUCTUATION FOR FREE SPACE OPTICAL COMMUNICATION.....</b>	<b>363</b>
<i>Abhishek Mani Shukla ; Sumanta Gupta</i>	
<b>KINECT BASED FRONTAL GAIT RECOGNITION USING SKELETON AND DEPTH DERIVED FEATURES.....</b>	<b>367</b>
<i>Manasa Gowri Hebbur Sheshadri ; Manish Okade</i>	

<b>HANKEL NORM FOR NONLINEAR DIGITAL SYSTEMS WITH HARDWARE LIMITATIONS AND EXTERNAL INPUT .....</b>	<b>372</b>
<i>Srinivasulu Jogi ; Priyanka Kokil</i>	
<b>DESIGN OF A 3-BIT CHIPLESS RFID TAG USING CIRCULAR SPLIT-RING RESONATORS FOR RETAIL AND HEALTHCARE APPLICATIONS .....</b>	<b>378</b>
<i>Durga Prasad Mishra ; Tanmaya Kumar Das ; Santanu Kumar Behera</i>	
<b>DEMAND-PRIVATE CODED CACHING AND THE EXACT TRADE-OFF FOR N=K=2 .....</b>	<b>382</b>
<i>Sneha Kamath ; Jithin Ravi ; Bikash Kumar Dey</i>	
<b>AN EFFICIENT MALWARE DETECTION TECHNIQUE USING COMPLEX NETWORK-BASED APPROACH.....</b>	<b>388</b>
<i>V. Mohanasruthi ; Abhishek Chakraborty ; B. Thanudas ; S. Sreelal ; B. S. Manoj</i>	
<b>SPECTRAL ANALYSIS OF A NONLINEAR WOLA-OFDM SYSTEM WITH DPD .....</b>	<b>394</b>
<i>Mohd Hamza Naim Shaikh ; Vivek Ashok Bohara ; Anand Srivastava</i>	
<b>MICROSTRIP QUASI-ELLIPTIC LOW PASS FILTER IN MULTILAYER TOPOLOGY .....</b>	<b>398</b>
<i>Ananya Parameswaran ; Singaravelu Raghavan</i>	
<b>ENERGY-EFFICIENT USER-CENTRIC DYNAMIC ADAPTIVE MULTIMEDIA STREAMING IN 5G CELLULAR NETWORKS.....</b>	<b>401</b>
<i>Pradip Kumar Barik ; Chetna Singhal ; Raja Datta</i>	
<b>SVR-PRIMAL DUAL METHOD OF MULTIPLIERS (PDMM) FOR LARGE-SCALE PROBLEMS .....</b>	<b>407</b>
<i>Lijanshu Sinha ; Ketan Rajawat ; Chirag Kumar</i>	
<b>ACOUSTIC FEATURES CHARACTERIZATION OF AUTISM SPEECH FOR AUTOMATED DETECTION AND CLASSIFICATION.....</b>	<b>412</b>
<i>Abhijit Mohanta ; Prerana Mukherjee ; Vinay Kumar Mirtal</i>	
<b>AERIAL MULTI-OBJECT TRACKING BY DETECTION USING DEEP ASSOCIATION NETWORKS.....</b>	<b>418</b>
<i>Ajit Jadhav ; Prerana Mukherjee ; Vinay Kaushik ; Brejesh Lall</i>	
<b>DISCRIMINATING HIGH AROUSAL AND LOW AROUSAL EMOTIONAL SPEECH USING MAHALANOBIS DISTANCE AMONG ACOUSTIC FEATURES .....</b>	<b>424</b>
<i>John Philip Bhimavarapu ; S S S Kalyan ; Vinay Kumar Mittal</i>	
<b>BIOMEDICAL CT IMAGE RETRIEVAL USING 3D LOCAL ORIENTED ZIGZAG FUSED PATTERN .....</b>	<b>430</b>
<i>Rakcinpha Hatibaruah ; Vijay Kumar Nath ; Deepika Hazarika</i>	
<b>ROC ANALYSIS FOR DETECTION OF EPILEPTICAL SEIZURES USING HARALICK FEATURES OF GAMMA BAND .....</b>	<b>436</b>
<i>Mustafa Sameer ; Akash Kumar Gupta ; Chinmay Chakraborty ; Bharat Gupta</i>	
<b>A LOW PROFILE WIDEBAND PLANAR ANTENNA FOR 5G WIRELESS COMMUNICATION APPLICATIONS .....</b>	<b>441</b>
<i>Rezaul Azim ; A K M Moimul Haque Meaze ; Mohammad Shuhrawardy ; Liton Chandra Paul</i>	
<b>A COMPACT, CIRCULARLY POLARIZED ANTENNA FOR HUMAN ACTIVITY CLASSIFICATION .....</b>	<b>445</b>
<i>Neha Joshi ; Paritosh Peshwe ; Ashwin Kothari</i>	
<b>DYNAMIC ROUTING AND SPECTRUM ALLOCATION IN ELASTIC OPTICAL NETWORKS WITH MINIMAL DISRUPTION .....</b>	<b>451</b>
<i>Sadananda Behera ; Goutam Das</i>	
<b>NO-REFERENCE VIDEO QUALITY ASSESSMENT (VQA) USING NOVEL INTER SUB-BAND 3-D DWT FEATURES.....</b>	<b>456</b>
<i>Anish Kumar Vishwakarma ; Kishor M. Bhurchandi</i>	
<b>COMPARISON OF FEATURE-MODEL VARIANTS FOR COSPEECH-EEG CLASSIFICATION.....</b>	<b>462</b>
<i>Rini A Sharon ; Hema A Murthy</i>	
<b>CLASSIFICATION OF AUTISM IN YOUNG CHILDREN BY PHASE ANGLE CLUSTERING IN MAGNETOENCEPHALOGRAM SIGNALS .....</b>	<b>468</b>
<i>Kasturi Barik ; Katsumi Watanabe ; Joydeep Bhattacharya ; Goutam Saha</i>	
<b>DATA ADAPTIVE COMPRESSED SENSING USING DEEP NEURAL NETWORK FOR IMAGE RECOGNITION.....</b>	<b>474</b>
<i>Ronak Gupta ; Aditya Kumar ; Santanu Chaudhury ; Brejesh Lall ; Vinay Kaushik</i>	
<b>LANGUAGE SPECIFIC INFORMATION FROM LP RESIDUAL SIGNAL USING LINEAR SUB BAND FILTERS.....</b>	<b>479</b>
<i>Soma Siddhartha ; Jagabandhu Mishra ; S. R. Mahadeva Prasanna</i>	
<b>CORRECTING AUTOMATIC CATARACT DIAGNOSIS SYSTEMS AGAINST NOISY/BLUR ENVIRONMENT.....</b>	<b>484</b>
<i>Turimerla Pratap ; Priyanka Kokil</i>	

<b>A ROBUST, LOW-COMPLEXITY REAL-TIME VEHICLE COUNTING SYSTEM FOR AUTOMATED TRAFFIC SURVEILLANCE</b> .....	490
<i>Arun Varghese ; G Sreelekha</i>	
<b>OTFS: INTERLEAVED OFDM WITH BLOCK CP</b> .....	496
<i>Vivek Rangamgari ; Shashank Tiwari ; Suvra Sekhar Das ; Subhas Chandra Mondal</i>	
<b>SYNTHESIS AND CLASSIFICATION OF HEART SOUNDS USING MULTI-COMPONENT OSCILLATORY MODEL</b> .....	502
<i>Samarjeet Das ; Samarendra Dandapat</i>	
<b>SIGNIFICANCE OF PHASE IN DNN BASED SPEECH ENHANCEMENT ALGORITHMS</b> .....	508
<i>P. Swetha Rani ; Sivaganesh Andhavarapu ; Sri Rama Murty Kodukula</i>	
<b>STUDY ON THE EFFECT OF EMOTIONAL SPEECH ON LANGUAGE IDENTIFICATION</b> .....	513
<i>Priyam Jain ; Krishna Gurugubelli ; Anil Kumar Vuppala</i>	
<b>A FUSION BASED CLASSIFICATION OF NORMAL, ARRHYTHMIA AND CONGESTIVE HEART FAILURE IN ECG</b> .....	519
<i>Sudestna Nahak ; Goutam Saha</i>	
<b>OUTAGE ANALYSIS OF MMWAVE INTEGRATED DEVICE-TO-DEVICE COMMUNICATION SYSTEM UNDER NAKAGAMI FADING CHANNEL</b> .....	525
<i>Ratakant Dinraj Govenker ; Atharva Yashodhan Phatak ; Rahul Bajpai ; Naveen Gupta</i>	
<b>ON VISIBLE LIGHT COMMUNICATION USING SOFT CANCELLATION DECODER FOR POLAR CODES</b> .....	531
<i>Nitin Jain ; Adrish Banerjee</i>	
<b>DESIGN AND ANALYSIS OF 20–60 GHZ BROADBAND LEFT-HANDED METAMATERIAL</b> .....	537
<i>P. Prasanna Kumar ; Prerna Saxena</i>	
<b>SPECTRAL FEATURES DERIVED FROM SINGLE FREQUENCY FILTER FOR MULTISPEAKER LOCALIZATION</b> .....	542
<i>Sushmita Thakallapalli ; Sudarsana Reddy Kadiri ; Suryakanth V Gangashetty</i>	
<b>MITIGATING JAMMING ATTACKS IN A MIMO SYSTEM WITH BURSTY TRAFFIC</b> .....	548
<i>Sujatha Allipuram ; Shabnam Parmar ; Parthajit Mohapatra ; Nikolaos Pappas ; Saswat Chakrabarti</i>	
<b>PERFORMANCE ANALYSIS OF NOMA AIDED COOPERATIVE RELAYING OVER <math>\alpha</math>-<math>\eta</math>-<math>\kappa</math>-<math>\mu</math> FADING CHANNELS</b> .....	554
<i>Brijesh Soni ; Dhaval K. Patel ; Yong Liang Guan ; Sumei Sun ; Yoong Choon Chang ; Joanne Mun-Yee Lim</i>	
<b>PERFORMANCE ANALYSIS OF PAM-DMT UNDER DOUBLE SIDED SIGNAL CLIPPING IN IM/DD BASED SYSTEMS</b> .....	560
<i>Kishore Vejanadla ; Saikiran Kollikonda ; Venkata Mani Vakamulla</i>	
<b>MACHINE LEARNING ENABLED DETECTION FOR QPSK-PD-NOMA SYSTEM EMPLOYING SINGLE MODE FIBER</b> .....	566
<i>Debi Pada Jana ; Sumanta Gupta</i>	
<b>FRIENDLY JAMMER LOCALIZATION FOR SECRECY ENHANCEMENT</b> .....	571
<i>Ravikant Saini ; Deepak Mishra</i>	
<b>CHANNEL ESTIMATOR DESIGNS FOR EMERGING 5G NEW RADIO CELLULAR SYSTEMS</b> .....	577
<i>Rakesh Munagala ; Rohit Budhiraja</i>	
<b>ENSEMBLE ALGORITHMS FOR EEG BASED EMOTION RECOGNITION</b> .....	583
<i>Nalini Pusarla ; Anurag Singh ; Shrivishal Tripathi</i>	
<b>METHODS FOR CELLULAR NETWORK'S OPERATION IN UNLICENSED MMWAVE BANDS</b> .....	587
<i>Bhanuprakash Ramiseti ; Abhinav Kumar</i>	
<b>ON THE LATENCY IN VEHICULAR CONTROL USING VIDEO STREAMING OVER WI-FI</b> .....	593
<i>Pratik Sharma ; Devam Awasare ; Bishal Jaiswal ; Srivats Mohan ; N. Abinaya ; Ishan Darwhekar ; Anand Svr ; Bharadwaj Amratur ; Aditya Gopalan ; Parimal Parag ; Himanshu Tyagi</i>	
<b>Author Index</b>	