## Contents

### Part I  Devices, VLSI and Embedded System

**Redesigned and Reinforced Low-Power Data Encryption Standard Using Hash Codes for High-Speed and High-Secure Applications**  
Thrived Dharbhashayanam, K. Manjunatha Chari and Pramod Dharbhashayanam  
3

**A Review of Low-Power VLSI Technology Developments**  
Nakka Ravi Kumar  
17

**Architectures of Charge Pump for Digital Phase Locked Loops**  
D.S. Rajeshwari and P.V. Rao  
29

**Performance Evaluation of 14-nm FinFET-Based Ring Counter Using BSIM-CMG Model**  
Bhavesh Soni, Gaurav Aryan, Ronit Solanky, Adit Patel and Rajesh Thakker  
39

**Theoretical Investigations on the Thermal Effects of VCSEL and Its Impact on the Frequency Response of Multimode Fiber Optic Link**  
Murali Krishna Karunakaran and Ganesh Madhan Muthu  
49

**Design and Modeling of Quadcopter for Elephant Monitoring Using Aerial Image Processing Approach**  
S.J. Sugumar and V. Sai Babu  
61

**Online Detection of Subclinical Mastitis Using Electrical Conductivity**  
Kalpak Shahane, V.D. Bachuwar and Pooja P. Gundewar  
71

**Home Surveillance System Using Internet of Things**  
Niraj Ukunde and Virendra V. Shete  
79
Design and Analysis of VCO for Parameter Optimization .......................... 87
Virendra Shete and Anshuman

Controlling Power System of Earth Station Using Embedded System ..................................................... 95
Sunil V. Bagade and V.V. Shete

Simulation and Control Model of Integration PV into Utility Grid Using MATLAB ............................... 103
 Manaullah, Haroon Ashfaq and Ibrahim Imbayah Khalefah Imbayah

Quantum Cost Optimization of Reversible Adder/Subtractor Using a Novel Reversible Gate .......................... 111
B.P. Bhuvana and V.S. Kanchana Bhaaskaran

A Dual-Rail Delay-Insensitive IEEE-754 Single-Precision Null Convention Floating Point Multiplier for Low-Power Applications ........ 119
J. Sudhakar, Y. Alekhya and K.S. Syamala

Part II Signal and Image Processing

Retinal Diagnosis Exploitation Image Process Algorithms ............................ 127
B. Srilatha and V. Malleswara Rao

Epoch Extraction Using Hilbert–Huang Transform for Identification of Closed Glottis Interval ............................. 139
Dhanalakshmi Samiappan, A. Jaba Deva Krupa and R. Monika

Hilbert–Huang Transform and Its Variants in Engineering

Data Analytics: State of the Art and Research Challenges ......................... 151
Mariselvam Ammasi Krishnan and Dhanalakshmi Samiappan

Smoothing and Noise Reduction in Images Using Variable Mode Decomposition ........................................ 167
Ajmeera Ravi, P.V. Naganjaneyulu and M.N. Giriprasad

A Hybrid Approach for Image Denoising in Ultrasound Carotid Artery Images .................................................. 175
Latha Subbiah and Dhanalakshmi Samiappan

Data-Dependent Subband Coder for Image Compression .......................... 185
Jaba Deva Krupa Abel, Dhanalakshmi Samiappan and Niraimathi Ponnusamy

Detection of Atrial Arrhythmias Using Autoregressive Modeling .......... 193
Ankita Mishra, Chandan Pandey and Sitanshu Sekhar Sahu

Interpretation of IRS-1C LISS Imagery for Vegetation Extraction:
A Spectral Perspective .......................................................... 201
Rubina Parveen, Subhash Kukarni and V.D. Mytri
ECG Analysis and Peak Detection Using Zero-Aliasing Correlation Filter ......................................................... 211
Neenu Jose and Nandakumar Paramparambath

An Extensive Study of Visual Search Models on Medical Databases ......................................................... 219
Padmaja Grandhe, Sreenivasa Reddy Edara and Vasumathi Devara

Firefly Algorithm-Assisted Segmentation of Brain Regions Using Tsallis Entropy and Markov Random Field .................. 229
N. Sri Madhava Raja, P.R. Visali Lakshmi and Kaavya Pranavi Gunasekaran

Endoscopic Image Enhancement Using Blind Denoising ............ 239
Amarsinh Deshmukh, Kapil Mundada and Pramod Kanjalkar

Silhouette Object Recognition Using Edge-Based Method ............ 251
Praveen Yadav and Manoj S. Nagmode

On the Extraction of Retinal Area from SLO Images Using RBFN Classifier and Its Comparison to the Optimally Trained ANN Classifier ................................................................. 261
Nimisha and Rana Gill

Compression of Hyperspectral Image Using PCA–DCT Technology ......................................................... 269
Ramhark J. Yadav and M.S. Nagmode

Effective Approach of Finding Missing Children Using Face Age Progressed Prediction Method .................. 279
Anagha Yogesh Nehete and Krishna K. Warhade

Edge Detection Algorithm Using Dynamic Fuzzy Interface System ......................................................... 287
Vasagiri Venkata Guruteja and Mantosh Biswas

Inderjeet Kaur and Rana Gill

Curvelet Transform Based Statistical Pattern Recognition System for Condition Monitoring of Power Distribution Line Insulators ..... 311
P. Surya Prasad and B. Prabhakara Rao

MRI Image Registration: Data-Driven Approach ......................... 319
C. Hemasundara Rao, P.V. Naganjaneyulu and K. Satyaprasad
<table>
<thead>
<tr>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analysis of Video Content Through Object Search Using SVM Classifier</td>
<td>325</td>
</tr>
<tr>
<td>Azra Nasreen, H. Vinutha and G. Shobha</td>
<td></td>
</tr>
<tr>
<td>Noise Destruction and Improvement of Speech Signal Quality Using Group Search Optimization (GSO) Algorithm</td>
<td>335</td>
</tr>
<tr>
<td>V. Anoop and P.V. Rao</td>
<td></td>
</tr>
<tr>
<td><strong>Part III  Communication</strong></td>
<td></td>
</tr>
<tr>
<td>SDA Algorithm for Network Path Identification</td>
<td>345</td>
</tr>
<tr>
<td>K. Arun and R. Rejimoan</td>
<td></td>
</tr>
<tr>
<td>Selective Encryption Algorithm Based on Natural Language Processing for Text Data in Mobile Ad hoc Network</td>
<td>355</td>
</tr>
<tr>
<td>Ajay Kushwaha, Hari Ram Sharma and Asha Ambhaikar</td>
<td></td>
</tr>
<tr>
<td>All Optical Health Monitoring System: An Experimental Study on Visible Light Communication in Biomedical Signal Transmission</td>
<td>361</td>
</tr>
<tr>
<td>C.R. Uma Kumari and S. Dhanalakshmi</td>
<td></td>
</tr>
<tr>
<td>Optimum Error Control Code for Underwater Acoustic Communication</td>
<td>371</td>
</tr>
<tr>
<td>Y. Venkata Ratnam, V. Malleswara Rao and B. Prabhakar Rao</td>
<td></td>
</tr>
<tr>
<td>N.A. Sangeetha and G.S. Binu</td>
<td></td>
</tr>
<tr>
<td>Simulink-Based Estimation of Spectrum Sensing in Cognitive Radio</td>
<td>387</td>
</tr>
<tr>
<td>Kavita Bani and Vaishali Kulkarni</td>
<td></td>
</tr>
<tr>
<td>Efficient Pre-distortion Power Amplifiers for OFDM Transmitters</td>
<td>399</td>
</tr>
<tr>
<td>P.R. Bipin and P.V. Rao</td>
<td></td>
</tr>
<tr>
<td>Link Statistical Pattern of Undersea Communication Networks</td>
<td>407</td>
</tr>
<tr>
<td>Sudhir K. Routtay, Anita Mahto, Divya R. Kumar, Karishma Guneseagar and Rumela Choudhury</td>
<td></td>
</tr>
<tr>
<td>Cooperative Spectrum Sensing in CR-VANET with Small-Sized Data Sets</td>
<td>413</td>
</tr>
<tr>
<td>S. Lakshmi Nandan and T. Sudha</td>
<td></td>
</tr>
<tr>
<td>Performance Enhancement of Eight-Channel WDM-RoF-PON System at 80 Gbps Data Rate Using Raman Amplifier</td>
<td>427</td>
</tr>
<tr>
<td>Jayesh C. Prajapati and K.G. Maradia</td>
<td></td>
</tr>
</tbody>
</table>
Analysis of Statistical Pattern in Multi-hop Cellular Networks ............................. 437
Alibha Sahu, Henna Kapur, Prathiba Anand and Sudhir K. Routray

Implementation of Dual 16 QAM Modulators Combined with $2 \times 2$ STBC Block .......................................................... 445
B.K.V. Prasad, D. Mazumdar, G. Narendra, G. Chaitanya and T.V. Mani Kanta

A Meandered Transmission Line-based Microstrip Filter for Multiband OFDM Applications ............................................. 455
Samiappan Vinothkumar, Shanmugasundaram Piramasubramanian and Muthu Ganesh Madhan

Vulnerable Network Analysis Using War Driving and Security Intelligence ................................................................. 465
Stuti Gupta, Bharat S. Chaudhari and Boudhayan Chakrabarty

Optimal Channel Estimation Using DFT-Based Interpolation with Comb-Type Pilots for OFDM Systems .............................. 473
Sireesha Biyyam and Anuradha Bhuma

Part IV Microwave, Electromagnetics & Antennas

Investigation of Rectangular Dielectric Resonator Antenna with Varying Probe Length ...................................................... 487
Bidisha Biswas, Durjoy Roy and Manotosh Biswas

Design, Simulation and Performance Comparison of 1, 2, 4 and 8 Elements Quarter-Wave Transformer-Fed Circular Patch Antenna Array at L Band for Airborne Applications ......................................................... 495
U. Srinivasa Rao and P. Siddaiah

Effect of Loading Dielectric Made of Silicone Rubber on Microstrip Antenna ................................................................. 517
Ishmeet Singh Riar, Suman Wadkar and Avinash Vaidya

Part V Miscellaneous

3D Smart Map ........................................................................................................ 527
Yash Jagtap, Hitesh Shewale, Dinesh Bhadane and M.V. Rao

Software-Defined Network-Based Intrusion Detection System .......... 535
Yogita Hande, Akkalashmi Muddana and Santosh Darade

CFIM: Toward Building New Cloud Forensics
Investigation Model ......................................................................................... 545
Ezz El-Din Hemdan and D.H. Manjaiah
TS Fuzzy Controller of Maglev System Based on Relaxed Stabilization Conditions .......................... 555
Munna Khan and Amged Sayed Abdelmageed Mahmoud

Firefighting Robot ............................................ 565
Udayagiri R. Pranava, Vishal Guruprasad, Preetham S. Nag and S. Suraj

A Nearest Centroid Classifier-Based Clustering Algorithm for Solving Vehicle Routing Problem ...................... 575
V. Praveen, V. Hemalatha and P. Gomathi

Design and Evaluation of Turbine Spirometer: A New Approach ............................. 587
Manisha Mhetre, Yogesh Patil and H.K. Abhyankar

Author Index ................................................ 595