

2024 IEEE International Conference on Signal Processing, Informatics, Communication and Energy Systems (SPICES 2024)

**Kottayam, India
20-22 September 2024**



**IEEE Catalog Number: CFP24A74-POD
ISBN: 979-8-3503-7614-2**

**Copyright © 2024 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:	CFP24A74-POD
ISBN (Print-On-Demand):	979-8-3503-7614-2
ISBN (Online):	979-8-3503-7613-5

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
Web: www.proceedings.com

CURRAN ASSOCIATES INC.
proceedings
.com

TABLE OF CONTENTS

Conference Chair’s Message	xii
Director’s Message	xiii
Registrar’s Message	xv
Conference General Chairs’ Message	xvii
Keynote Address	1
1. Harnessing Signals, Transforming Data: AI’s Impact on Cultural Heritage, Education and Healthcare <i>Dr. Ganesh Neelakanta Iyer, National University of Singapore</i>	1
2. Responsible & Safe AI <i>Prof. Ponnurangam Kumaraguru, IIIT Hyderabad</i>	3
3. Insights from Deploying and Measuring LoRa Technology in Smart Campus Environments <i>Dr. Hari Prabhat Gupta, IIT (BHU) Varanasi</i>	5
4. Intelligent IoT Sensing for Aging Well: Research Activities and Future Directions <i>Prof. Michael Sheng, Macquarie University Australia</i>	6
5. Modern Radar Techniques for Automotive Applications <i>Dr. Marlene Harter, Offenburg University of Applied Sciences, Germany</i>	8
6. Advancing Airspace Safety and Security using UAV Risk analysis and Acoustic Counter-UAS <i>Dr. Sreejith Vidhyadharan Nair, Univerisity of North Dakota, USA</i>	10
7. Novel Integrated Computing Architectures as Alternatives to the Von Neumann Paradigm <i>Dr. Arun Ashok, Co-Founder, Silizium Circuits Private Limited</i>	11

Publications

Sl.no.	Paper ID	Title & Authors	Page no.
1.	01	A Multistage Cascaded Neural Network Model to Identify the Severity of Epileptic Attack <i>Martha Simon, and Lidiya Lilly Thampi</i>	13
2.	114	A Low Complexity Landslide Susceptibility Mapping Model of Chikmagalur, Karnataka, India <i>Aditya Goutam Shah, Tarun Kasa, Tarun Murugan, Siddhant Sharma, ShwetaVincent, and Om Prakash Kumar</i>	19
3.	115	Design and Analysis of Circularly Polarized Miniaturized 2T2R MIMO Proximity Coupled Patch Antenna for 6G Wireless Communication <i>Souradeep Dey, and Milind Thomas Themalil</i>	24
4.	116	Machine Learning for Flood Susceptibility Mapping of the Chennai Floods of 2023 <i>Aditya Goutam Shah, Mohammed Sahil Nakhuda, Spandan Kumar, Vaibhav VipinM, Shweta Vincent, and Om Prakash Kumar</i>	30
5.	120	Performance Comparison of Skin Cancer Detection and Classification using CNN <i>Safana Rafeeqe, and Abini M.A</i>	36
6.	137	Economic Design of Variables Modified Double Sampling Plan under Double Specification Limits <i>S. Sridevi, M. Amirthavalli, S. Pandi Selvi, and S. Balamurali</i>	42
7.	147	Assessing Current Scenario of Insider Threat in the Perspective of Recent Pandemic <i>Sandra G, Salaja Silas, and Elijah Blessing Rajsingh</i>	48
8.	149	Secure Ration Provision: Ethereum Blockchain Powered Supply Chain Management for India's Public Distribution System <i>Sujatha Rajkumar, Kishorkumar Balaji, Zubin Palit, and Sabyasachi Mohanty</i>	55
9.	15	Leveraging ResNet for Efficient ECG Heartbeat Classification <i>Lovely Yeswanth Panchumarthi, Sriya Padmanabhuni, and Sumalatha Saleti</i>	61
10.	155	Challenges in training Deep Q Network <i>Sachin John Thomas, Prithvi J, Syed Muhammed Fahd, and Imthias Ahamed T P</i>	67

Sl.no.	Paper ID	Title & Authors	Page no.
11.	164	EIROB : An Emotionally Intelligent ROBot for Empathetic Support Safad Ismail, and Harsha Vasudev	73
12.	165	Generation of Bloom's taxonomy-based complex-level questions using knowledge graph <i>Blessy Paul P, and Cini Kurian</i>	79
13.	176	Deep Learning Based Fire Detection System <i>Alaika Saji, Antony Hamlin Beveira, Deeptha Shaji, Hrudy Nair, and JacobThomas</i>	85
14.	180	Exploring Missing Value Handling Techniques for Optimized KNN Heart Disease Prediction <i>Jeena Joseph, and K Kartheeban</i>	91
15.	198	Legal Assistance Redefined: Transforming Legal Access with AI-Powered LegalLink <i>Susan Jacob, Prisly Mary Jacob, Jo Cheriyan, and Safad Ismail</i>	99
16.	199	When Artificial Intelligence meets Navarasas - Facial Expression Classification in Kathakali Using DSFD and CNN <i>Ganesh Neelakanta Iyer, Nattapong Saengarunvong, and Minh Hien Le</i>	105
17.	205	Redefining Work in the Age of AI: Challenges and Pathways to Opportunities <i>Pratiksha Tadas, and Sudhir Agarmore</i>	111
18.	207	A Study of Digital Modulation Schemes over Multi-Cluster Fluctuating Two-Ray Fading Channels for Terahertz Wireless Communication <i>Laishram Mona Devi, Maibam Sanju Meetei, Aheibam Dinamani Singh, and LaishramPrince Singh</i>	116
19.	220	Apnea Aware: An Intelligent Sleep Monitoring and Intervention System for Obstructive Sleep Apnea <i>Archana Aniyana, Liya Sam, Sereen Sabu, and Soorya S Pai</i>	121
20.	23	Efficient Layouts of Complete t-Partite and Complete Networks into 3-Ary n-Cubes for Optimized Parallel Processing in Multiprocessing Systems <i>S Rajeshwari, M Rajesh, and C Sowmiya</i>	127
21.	230	Multimodal Deepfake Detection using Deep-Convolutional Neural Networks and Mel-Frequency Cepstral Coefficients <i>Noel Martin, Sharun Raj Nambayil, Devikrishna U, Joel Jismon P, and Fasila K.A.</i>	132

Sl.no.	Paper ID	Title & Authors	Page no.
22.	238	Analysis on the consensus algorithms with reputation-based incentives in the healthcare blockchain networks <i>Sajna S, and Manu J Pillai</i>	138
23.	243	Smart Heart Monitor using Machine Learning <i>Shanmuga Sanjeevi P S, Suganthi Evangeline, Sabhareeswaran S, Rupasri D, andSantha Lakshmi S</i>	146
24.	244	Harnessing Image Analysis for Early Leukemia Detection in Bone Marrow Samples <i>R.Rajalakshmi, P.Sivakumar, Ms.Krishnakumari, and G.Subhashini</i>	151
25.	254	Modelling and Stability Analysis of Dynamic Droop Controlled Microgrid based on Dynamic phasor <i>Binu Krishnan U, Hemachandra Reddy K, Balagopal Reddy G, RamkishorekumarReddy P, Puspha Raj H, and Suresh</i>	158
26.	257	Credit Endorsement Forecast Utilizing Troupe Learning and XGBoost <i>Narendra Babu Pamula, Shaik Suhana Begum, Upendra Kanakapudi, Vamsi Krishna Koparaju, and Rajesh Repudi</i>	164
27.	260	Sahayak: Affordable AI enabled Assistive Technology for Intellectually Disabled <i>Tejas Girhe, Esha Pandya, Sheejamol P T, and Anu Mary Chacko</i>	170
28.	263	Field Size-based Packet Header Anomaly Detection with Rule-Based Normal Profile Updating for Intrusion Detection <i>Vishnu Prasad S, Malarkodi. B, and Michael Kutty KG</i>	175
29.	267	Enhancement of Voltage Stability by Optimal Integration of Wind Source with GRU Based SVC Compensator <i>Abhilash Krishnan T. K. , Devaraj. D, and Ranjeesh R Chandran</i>	181
30.	269	Bipartite Photonic Analysis: Terahertz Stripline Dipole Antenna <i>Arjun J M, Titto Anujan, and Himesh A H</i>	187
31.	271	Context-based Marwari text clustering <i>Pranav Malani, and Prafulla Bafna</i>	192
32.	279	Identification of Paddy Leaf Disease using Machine Learning Methods <i>Neelukumari. K.S, Santhosh. P, and Rithika. R</i>	197

Sl.no.	Paper ID	Title & Authors	Page no.
33.	281	EchoLink : A Voice Based Email Assistance For Blind <i>Naveen Philip Abraham, Joppen George, Jonathan Chandy, Kevin Sajan, and BiniM. Issac</i>	203
34.	286	A Novel Generator Coupled Dual Battery Energy Management System for Electric Vehicles <i>M. Raja Nayak, K. Uday Raju, Prem Kumar Guntoti, Arisetty Siva Raghavendra, Johnsaida Gullapalli, Koyi Sai Kiran, and A. Srinivasarao</i>	210
35.	287	A Novel Circular Flux Dual Rotor Generator <i>M. Raja Nayak, Nagarjuna Guduri, Sai Ganesh Ullam, Revathi Eega, SrikanthAkula, Sapavathu deepika bai, and T. Nagaraju</i>	215
36.	288	Enhanced Mobile Robot Obstacle Avoidance: A Reinforcement Learning Approach with State-Dependent Action Set <i>Sachin John Thomas, Imthias Ahamed T.P, Syed Muhammed Fahd, and Pritvi J</i>	221
37.	291	Short Term Load Forecasting And Anomaly Detection in Residential Power Consumption <i>Anil Francis, and Bijoy A. Jose</i>	227
38.	297	Refined Intrusion Detection Model for Internet of Things Networks <i>Renya Nath N, and Hiran V Nath</i>	234
39.	298	Agile Time Quantum Round Robin Algorithm <i>Sulalah Qais Mirkar, Amiksha Bobal, and Sanjana Gattani</i>	240
40.	299	Enhanced Heart Disease Classification: An Ensemble-Based Deep Learning Approach <i>Nivaashini M, Sathish Kumar G, Uma Maheshwari G, Soundariya R S, ArunKumar B, and Vijaya G</i>	247
41.	300	A Comprehensive Evaluation of Packet Compression Techniques for NoC <i>Femy John, and Simi Zerine Sleeba</i>	253
42.	306	Multimodal Emotion Analysis Using Integrating NLP, AI, and Facial Expression Recognition for Enhanced Emotion Detection <i>Alby Babu, Dharshini T, Gayathry Krishnan V.S, Ummu Haiman V.P, AnnieJulie Joseph, and Rajesh K.R</i>	258
43.	310	Brain Tumor Detection and Classification Using Deep Neural Network and Interpretation Using XAI Techniques <i>A. Anitha, Anjana Nair, and Balakrishnan Kamaraj</i>	264

Sl.no.	Paper ID	Title & Authors	Page no.
44.	322	Enhancing LLM Performance on Legal Textual Entailment with Few-Shot CoT-based RAG <i>Sneha Ann Reji, Reshma Sheik, Sharon A, Avisha Rai M, and S. Jaya Nirmala</i>	270
45.	328	Revolutionizing Disaster Healthcare <i>Aaggi Rose Thomas, Albert Johnson, Baasil Samaan A A., Dana Johnson, and Sabna N.</i>	276
46.	336	Revolutionizing Neurological Diagnosis: Innovations in ErrP for Enhanced Detection <i>Praseeda B Nair, Godwinraj D, Little Therese Mathew, N Sreedu Krishna, and Sheryl Varghese</i>	283
47.	376	Advancements in VLSI implementation of lossless ECG signal compression schemes <i>Dhanusha A, and Vipula Singh</i>	290
48.	377	AI-Powered Traffic Surveillance: License Plate Recognition with Non-Helmet Detection Using YOLOv8 <i>S. Berlin Shaheema, Benila. N.S., P. Jose, I. Edwin Albert, A. Anorelin, and Elnfance Tony</i>	296
49.	390	Integrated Testing Framework for μDMA Peripherals <i>Akza Baby, Thejus P Aditya, and Adersh V R</i>	302
50.	401	Speaker Verification Using Embedding Parameters in Noisy Environments (Transport Vehicles) <i>Sameer V V, Aljinu Khadar K V, and R K Sunil Kumar</i>	307
51.	405	Grid-integrated Photovoltaic System with Reactive and Active Power Capability <i>Aneetta Benny, Angel Mariya K.S, Ashna Pious, Cinta Ann Philip, Tomson Thomas, and Anoopraj M. R.</i>	314
52.	409	Implementation of Microbial Fuel Cell for Electricity Generation <i>Ann Maria George, Aravind M Nair, Harichand M Ramesh, Kiran Jayarajan, GinuAnn George, and Tomson Thomas</i>	320
53.	416	Optimizing Recommendation Systems: Analyzing the Impact of Imputation Techniques on Individual and Group Recommendation Systems <i>Sri Phani Bhushan Mada, Rahul Tata, Sneha Teja Sree Reddy Thondapu, and Sumalatha Saleti</i>	326
54.	427	AI-based Diabetic Retinopathy Grading Using Raspberry Pi <i>Aparna S, Madhurema V J, Nandana Nair, Parvathi Mohan, and Rajeev Rajan</i>	332

Sl.no.	Paper ID	Title & Authors	Page no.
55.	435	Quantum Anti-Spyware Protocols for Fault Injection Detection <i>Nakshathra Nazer Karakkadan</i>	337
56.	447	ROS2 - Powered Autonomous Navigation for TurtleBot3: Integrating Nav2 Stack in Gazebo, RViz and Real-World Environments <i>Athul Krishna M J, Ajai V Babu, Suraj Damodaran, Rekha K James, Muhammed Murshid, and Tripti S Warriar</i>	342
57.	449	A Non-isolated Bidirectional Buck-Boost DC-DC Converter with Minimum Component Count <i>Sunil Mandal, and Prajof P</i>	348
58.	450	Automated Detection of Poultry Diseases using Implicit Pattern Mining over Explicit Image Analysis <i>Khushi Donthi, Kuval Kiran, and Gowri Srinivasa</i>	354
59.	452	A Comparative Study of Wiener, Richardson-Lucy, and Total Variation Techniques for Astronomical Images <i>Vishnu Vasudev, and M.V Rajesh</i>	359
60.	453	Optimizing Loss Functions in Conditional GANs for Astronomical Image Deconvolution: A Comparative Study at Varied Epochs <i>Vishnu Vasudev, and M.V Rajesh</i>	363
61.	456	Intelligent Water Quality Assessment System for Industrial Regions: Integrating Sensors, IoT and Random Forest Classification <i>Mayookha S Lekshmi, Gouri N S, Namitha Karnan, Nandana M, and Lintu Rajan</i>	369
62.	460	FPGA Implementation of Health Monitoring System for High-Risk Cardiac Patients <i>G.L. Madhumati</i>	375
63.	464	Enhancing Mobile Robot Navigation in TurtleBot3 Burger: A ROS-Enabled Approach Focusing on Obstacle Avoidance in Real-World Scenario <i>Ajai V Babu, Athul Krishna M J, Suraj Damodaran, Rekha K James, Arjun VKumar, and Tripti S Warriar</i>	380
64.	465	Advancing Early Autism Detection in Children through Machine Learning-Assisted Spectrogram Analysis <i>Lekshmylal P L, Vinod B R, Ashalatha Radhakrishnan, and Shiny G</i>	386

Sl.no.	Paper ID	Title & Authors	Page no.
65.	466	Direction Finding in Time Modulated Linear Arrays Using Supervised Machine Learning <i>Magnel Rose Mathew, Aswathi P, Deepti Das Krishna, and P Murali Krishna</i>	391
66.	467	Reconfigurable Intelligent Surface Enabled Cognitive Radio Networks <i>Vishwas Srivastava, and Binod Prasad</i>	396
67.	469	EmoClass: Subject-Independent Emotion Classification for BCI Systems Using EEG Signals <i>Ambati Rami Reddy, Kannadasan K, Haresh M V, V. Sridevi, B. and ShameedhaBegum</i>	401
68.	470	Planar Complementary Spiral Sensor for Permittivity Characterization of Oil Samples <i>Sheeja Vincent, Mridula S, and Anju Pradeep</i>	407
69.	472	A nasal-thermistor based study for continuous monitoring of breathing rate and apnea detection <i>Thomaskutty Mathew, and Anoop C. S.</i>	413
70.	473	Progressively Stacked Serial Encoder Decoder For MRI Super Resolution <i>Jinaga Tulasiram, Shoumik Dutta, Balaji Banothu, and Nickolas S</i>	418
71.	474	Addressing Low Frequency Circulating Current Challenges in Solar Grid-Connected Systems with Parallel Inverters <i>Jinuraj K G, Lekshmi K R, Athira B P, and Aby Joseph</i>	423
72.	475	STGTP: Enhancing Stance Detection with Graph and Text Embedding through the Post-Graph Model <i>Samineni Bhavani, and Hima Bindu Kommanti</i>	429
73.	477	Optimizing Diabetic Retinopathy Detection with Advanced SMOTE-based Data Augmentation <i>Minnu C Tomy, and C Malathy</i>	436
74.	478	Computationally Efficient CNN Based Smart Dehaze Net for Haze Removal of Biomedical Images <i>Padmadarsan, Biju K.S, and Sravan M.S</i>	442
75.	481	Classification of Indian Medicinal Plant Species Using Attention Module With Transfer Learning <i>Sivappriya.K, and Mithun Kumar Kar</i>	449

Sl.no.	Paper ID	Title & Authors	Page no.
76.	496	Forensic Automatic Speaker Recognition: Coping with Impersonated Speech <i>Laxmi Priya Harshitha T, Lekshmi M Nair, and Leena Mary</i>	457
77.	497	Advancements in Crime Detection: Bridging Domain Gaps with Dual Variational Generation <i>Devipriya Sozharajan, Riya Mittal, Yash Singhvi, Evany Anne M, and M. Brindha</i>	463
78.	502	Real Time Vulnerability Analysis & Risk Prioritization using Zensar's Risk Assessment Framework <i>Vishwas Pitre, Ashish Joshi, and Suman Das</i>	469
79.	503	Frequency Response Assessment of Electricity Grid by Regression Analysis <i>Beenu Mary Panicker, and R. M. Shereef</i>	475
80.	507	StressDetect: A Deep Learning Approach for Mental Stress Detection Using Time-Frequency Representation of EEG Signals <i>Kannadasan K, Lilly Pushparani M P, Jerina Stanis J, Haresh M V, Ambati RamiReddy, and B.Shameedha Begum</i>	480
81.	513	Crafting Synthetic Dental Radiographs with Generative Adversarial Networks <i>Shweta Shirsat, and Siby Abraham</i>	486
82.	527	Design and Investigation of Two Port Circularly Polarized Microstrip Array Antenna with High Gain and Pattern Diversity Features <i>Mamta Sood, and Avinash Rai</i>	492
83.	528	Efficient Optimization of Dual Port Circularly Polarized 1*2 Array based Microstrip Antenna using Machine Learning Algorithms <i>Mamta Sood, and Avinash Rai</i>	496
84.	535	Quantum Enhanced Prediction for Breast Cancer Electronic Health Records <i>Rajesh G, Madhumitha R, Arunagiri S S, and Vishal M</i>	501
85.	536	Leveraging Light GBM, MLP, and Extra Tree Classifiers for Early Detection and Prediction of Autism Spectrum Disorder <i>Bama S, Aadhya A, Bhargav B S, C Disha, and B R Yashwanth</i>	507
86.	540	CNN Based Plant Leaf Disease Detection Using Raw Leaf Images for Efficient Plant Health Monitoring in Agricultural IoT <i>Pooja Shibu, and Gangireddy Narendra Kumar Reddy</i>	513

Sl.no.	Paper ID	Title & Authors	Page no.
87.	542	Machine Learning Based Lung Sound Analysis Using MFCC Features <i>Fathima Bareeda E P, and Gangireddy Narendra Kumar Reddy</i>	519
88.	543	Enhanced Conditional Random Field Models for Cause and Effect Detection in Financial Documents <i>Satyam Agrawal, Ashitosh Phadatare, and Anand Kumar Madasamy</i>	525
89.	545	Spectral Efficiency Analysis for mmWave Full Duplex Multihop IAB Networks <i>Sharmila M, and Praveen Pawar</i>	531
90.	56	Harnessing Generative AI for IoT Enhanced Education <i>K. M. Priya, P. Soundarya, E. Kungumaraj, P. Bhagyarathi Salome, P. Subathra, and Susmi Mariam Varghese</i>	537
91.	80	A Wideband Miniaturized Microstrip Antenna for Sub-8 GHz New Radio for 6G Connectivity <i>Karthika Madhu, P Vamsi Krishna, Aadirath Singh, and Milind Thomas Themalil</i>	543