

2025 Second International Conference on Computing, Semiconductor, Mechatronics, Intelligent Systems and Communications (COSMIC 2025)

**Mangalore, Karnataka, India
21-22 November 2025**



**IEEE Catalog Number: CFP25VQ7-POD
ISBN: 979-8-3315-7365-2**

**Copyright © 2025 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:	CFP25VQ7-POD
ISBN (Print-On-Demand):	979-8-3315-7365-2
ISBN (Online):	979-8-3315-7364-5

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

2025 IEEE COSMIC

Table of Contents

Sl. No.	Article Title	Page no.
	Communications	
1	A Study on Beamforming Capabilities of Yagi-Uda Versus Short Dipole Antennas <i>Mahima Sk and Priyadarshini K Desai</i>	1
2	A Relationship-Xgboost Model for User Behavior Pattern Recognition in Social Internet of Things <i>Praveen Murthy K S, S.P.Shiva Prakash and Kirill Krinkin</i>	7
3	An Energy-Aware Routing Framework for Siot Using Relationship-Based K-Means Clustering <i>Anusha R.S, S P Shiva Prakash and Kirill Krinkin</i>	13
4	Temporal Fusion Transformer-Based Framework for Predicting Network Traffic in Femto Cell Infrastructure <i>Sheela G V, S P Shiva Praksh and Kirill Krinkin</i>	19
	Computing	
5	Efficient Parallel Processing of Structured Big Data Using Scala and Apache Spark <i>Sampath Kini K and Sreekantha Desai Karanam</i>	25
6	ZKPass: Making Authentication Invisible: A Zero-Knowledge Proof Approach <i>Srinivas P M, Sudeepa K B, Ananth Prabhu, Ravi Babu and Roshan Fernandes</i>	30
7	MindSync: An Intelligent Journaling Tool for Mental Well-being and Productivity Analysis <i>Srinivas P M, Prashantha , Aditya Bhagwat, Dhanush Naik and Kumar Marathe</i>	36
8	Heartguard: A Hard Voting Ensemble Framework for Reliable Cardiovascular Disease Prediction <i>Shruti Patil and Vijetha U</i>	42
9	Adaptive Urban Traffic Control Using Camera Vision and Emergency Vehicle Mobile Interface <i>Shilpa B L, Mayank M, V and Md Fakruddin S</i>	48
10	Cross-Border Remittance System with Smart Contract Automation <i>Shreya Shenoy, Grishma, Vaishnavi, Arya and Srividya S</i>	54
11	A Deep Learning Framework for Automated Ecg Image Analysis and Valvular Heart Disease Detection <i>Ayesha Saba, Tabassum Ara, Juhi Sudarshan, Karnika R and Shreyansu Panda</i>	60
12	A Blockchain-Based Framework for Secure Management of Government and Law Enforcement Records <i>Himanshu S Shetty, Pratheek G Shetty , M Imaad Iqbal, Shifali Florine Lobo and Mustafa Basthikodi</i>	67

13	Visionary Code: An AI-Driven Platform for Blind and Visually Impaired Programmers <i>Permanki Guthu Rithesh Pakkala, Akhila Thejaswi R, Bellipady Shamantha Rai, Sudheer Shetty, Vasudeva Rao P V and Shrinidhi Upadhyaya</i>	73
14	Echospeech: Enhancing Speech for Children with Autism and Language Disorder Using Deep Learning <i>Akhila Thejaswi R, Permanki Guthu Rithesh Pakkala, Bellipady Shamantha Rai, Sudheer Shetty, Vasudeva Rao P V and Navya Kulal</i>	80
15	Smart Wearable Device for Enhanced Mobility and Safety of the Visually Impaired Person <i>Akhila Thejaswi R, Permanki Guthu Rithesh Pakkala, Bellipady Shamantha Rai, Sudheer Shetty, Shetty Roshith Raghurama and Nagaraj Prakash Shetty</i>	86
16	A Novel Deep Learning-Based Framework for Early Diagnosis of Neurodegenerative Diseases <i>Vidyarani Uttam Achar and Nethravathi P S</i>	92
17	IoT-Based Traditional Organic Implementation of Jeevamrutha Using Image Processing <i>Shilpa B L, Padmaja K, Manjunath Ramanna Lamani and Keerthana M M</i>	97
18	Scalable Parallelization of Machine Learning Models Using Hybrid Data–Model Partitioning <i>Chaitra K M, Mustafa Basthikodi and Poornima B V</i>	103
19	MotiVate: Machine Learning Based Emotion Prediction and Recommendation Application for Managing Stress and Pressure <i>Basappa B Kodada, Thanvi, Ujwal, Shravan S Poojary and Vikesh</i>	109
	Intelligent Systems	
20	Energy-Efficient 3D Drone Navigation Using A* Algorithm <i>Aadya Jha, Mugdha Deshpande, Krishnaraj Chadaga , Jimcymol James and Rajesh Mahadeva</i>	117
21	Efficient Dna Sequence Compression: A Comparative Study of Huffman and Arithmetic Coding with Data Structures <i>Manas Kulkarni, Atharva Deshpande, Samiksha Nalawade, Revati Aute, Rajlakshmi Desai and Minal Deshmukh</i>	123
22	Unveiling Sentiments in Movie Reviews: A Comparative Study of Computational Approaches for Sentiment Analysis <i>Kotha Rupesh Sai Ram, Raghu Ram Sai Lingutla, Sarin Kumar Sathunuri, Mohana Gopala Krishna Reddy Nalamalapu and M.Srinivas</i>	129
23	Wavelet-Based Deep Neural Network with Attention for Interpretable Epileptic Seizure Prediction Using EEG Spectrograms <i>Abhishek S. Rao, Ramaprasad Poojary, Shravya A Prabhu, Shravya S Shetty, Diya M Shetty and H. Nagesh Shenoy</i>	136
24	Optimizing Rice Quality Through Image Processing and Machine Learning Techniques <i>Chandra Singh, K.V.S.S.S.S.Sairam and Akhilesh K S</i>	142

25	Transforming Upper Limb Rehabilitation: Real-Time, Holistic Feedback Using Python and Sensor Fusion <i>Vasantha Kini T, Haimanti Basu, Aneesha Acharya K and S Meenatchisundaram,</i>	147
26	AI-Driven Dried Coconut Classification Using Computer Vision <i>Rajesh Nayak, Anurag R. Rao, Harsharaj, Nayak Akshay Ravindra and Rahul Mendon</i>	154
27	A Fusion-Based Ensemble Approach for Early Diagnosis of Infectious Pulmonary Diseases Using Chest X-Rays <i>Chaithrashree M and Mustafa Basthikodi</i>	160
28	Hybrid Yolo-CoAtNet Model for Intelligent Detection of Critical Fetal Parameters <i>Suhas A Bhyrate, Shreelakshmi Pai, Anish Dileep Gunagi, Aneesh M, Shubham Kumar Azad and Mustafa Basthikodi</i>	166
29	Explainable Fairness-Attentive ML and DL (Fair-ExplainHR): Ethical and Transparent Attrition Prediction with Engagement, Economic, and Behavioral Signals <i>S.V.N. Sreenivasu, Meesala Sivaiah, Manikanta Mallela, Ikkurthi Dhanush, Karanam Madhavi and Dodda Venkata Reddy</i>	172
30	Attention-Guided Multi-Scale Feature Fusion for HER2 Scoring in HE-Images Based on Histopathology Images Trained Model <i>Pateel G P, Kedarnath Senapati, Gurusiddayya Hiremat and Roopashree Nayak.</i>	179
31	Transcending Image Generation Paradigms: Fusion of Transformer-Based Latent Diffusion and Semantic Clip Embeddings <i>Sasi Vardhan Reddy Mandapati and Venkata Mani Nikhil Reddy Mandapati</i>	186
32	AI-Powered Blockchain-Backed System for Cross-Media Deepfake and Forgery Detection <i>Swathi N Pai, Sharanya S Parol, Riya R, Bavith L Suvarna and Mustafa Basthikodi</i>	192
33	Temporal Evolution of Phishing URL Patterns Using Heuristic Features and ML Analysis <i>S Shyam Kumar</i>	199
34	Structured Representation of Free Text and Audio in Medical Records Using Deep Learning <i>Amrutha, Raghavendra S, Pankaj Kumar and Dinesha L</i>	204
35	Analysis Of Kannada Tweets for Depression Using Machine Learning Models <i>Praveen V D, Soorya Krishna K, Smeely Mary Picardo, Aishwarya and Prashanth Kannadaguli</i>	210
36	Billiards Optimized Depthwise Separable Convolutional Neural Network for Fake User Identification Using MERN Stack <i>V Chandra Prakash, S M Hari Jaswanth, M Gokulnath, G Senthilkumar, L Jabasheela and S Balaji</i>	216
37	Adversarial Prompting and Jailbreak Attacks in Large Language Models: Detection and Mitigation Strategies <i>Abdul Muqet Armar, Nubila Jaleel and Mohammed Sinan M</i>	222
38	Semantic Emoji Prediction for social media: A BiLSTM+Attention Approach to Categorizing Emojis in Tweets <i>Kavana B R, Anushree Raj, Pallavi M O, and Khadersab Adamsab</i>	228

39	A Hybrid AI Approach for Predicting and Preventing Wild Animal Movements in Rural and Farmland Ecosystems <i>Aastha Londhe, Navaneeth Bhaskar, Ruchitha Prabhu, Ankitha Das and Ambika Jayashanthi</i>	234
40	AI-Powered Detection of Potato Leaf Diseases Using Deep Neural Network <i>Alapan Ghosh, N. D. Adesh, Raghavendra S and Devidas Bhat</i>	240
41	Explainable Multi-Task Deep Learning and Vis-NIR Spectroscopy for Non-Destructive Mango Quality Assessment <i>Shana Santhosh and Dheeraj Hebri</i>	246
42	Memory Dropout GRU Architecture for Efficient and Generalizable Sequence Learning <i>Shravan Kumar, Jeevith B T, Asthik K L, Rathishchandra Ramachandra Gatti and Sri Haripriya Rai N</i>	252
43	Dashboard For Swachhta Using YOLOv11 <i>Denzil Serrao, M Sooraj Shenoy, Karthik Baliga, Yatheesha K V and Ganesh Pai</i>	257
44	Clearflow: Deep Learning-Based Fluency Enhancer for Stuttered Speech <i>Suketha, Vrinda U N, Thejaswini K, Brundha Hegde and Khushi Rai</i>	263
45	Harnessing Technology for Precise Detection and Classification of Cervical Cancer <i>Ashwini B, Manjula Gururaj Rao, Venugopala P S, Ankitha Nayak and Shriraksha Adiga</i>	269
46	Domain-Adaptive GAN for Underwater Image Enhancement <i>Poornima B V, Charith Rai K, Srujan M Naik, K C Shodan and Hemanth A Naik</i>	275
47	Smart IoT-ML Ecosystem for Dynamic Pest Surveillance in Food Storage Environments <i>Vidya V V, Prapulla G, Suhas A Bhyratae and Poornima B V</i>	281
48	Multi-Model Ensemble Framework for Accurate Diagnosis of Colon Histopathological Images <i>Sowmya S and Anand Tapadiya</i>	289
49	An AI-Driven Ensemble Framework for Personalized Career Coaching for Job Readiness <i>Chandra Naik, Tangevva Rudrappa Gadad, Varshitha R, Yoghana B K and Srushti N B</i>	295
50	Machine Learning-Based Non-Invasive Anemia Detection Through Conjunctival Analysis <i>Benaka, Srividya Bhat, Shashwatha B K, Manvith and Yatin Bhovi</i>	301
51	Non-Invasive Childhood Malnutrition Detection Using Salivary Biomarkers and Machine Learning on a Synthetic Dataset <i>Suchetha G, Sumukh S, Tanish Radhakrishna, Shrijith and Prateek Deshbhandari</i>	307
52	AI Enhanced IELTS Preparation Using Custom Neural Networks <i>Vasudeva Rao P V, Permanki Guthu Rithesh Pakkala, Akhila Thejaswi R, Bellipady Shamantha Rai, Sudheer Shetty and Madhukar Bhaktha</i>	313
53	Impact of Real-Time Posture Yoga on Brain Regions and EEG-Based Classification Using Machine Learning <i>Rashmi C R and Shantala C P</i>	319

54	Regional Crop Yield Forecasting Using a Stacked Hybrid Model with Temporal -Spatial Feature Fusion <i>Bhavana Gowda D M, K.S Arvind and Nachappa M N</i>	325
	Mechatronics	
55	Design and Analysis of SRAM Circuits at 45nm Technology Using Sleeper Cells <i>Niveditha, Shashank G K , Sumanth R R, Priyadarshini K Desai and Hemanth Prasad N</i>	330
56	Design, Analysis and Testing of a Monolithic Flexure-Driven Mechanism for a Piezoelectric Inchworm Drive <i>Vincent Linish Dsouza and Muralidhara</i>	337
57	Design And Analysis of Low-Power 10 Transistor Full Adders Using Novel XOR XNOR Gates <i>Akshath M, Kiran Kumar and Prashanth Kumar Shetty</i>	343