# **2024 IEEE International** Conference on Signal Processing, Information, Communication and Systems (SPICSCON 2024)

Khulna, Bangladesh 1-2 November 2024



**IEEE Catalog Number: CFP24V53-POD** 

979-8-3315-1022-0

## 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:
 CFP24V53-POD

 ISBN (Print-On-Demand):
 979-8-3315-1022-0

 ISBN (Online):
 979-8-3315-1021-3

#### **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





#### 2024 IEEE International Conference on Signal Processing, Information, Communication and Systems (SPICSCON) 1-2 November 2024, Khulna University, Khulna, Bangladesh

### **Table of Contents**

Paper ID	Paper Title	Page #
1	TranSenA: A Transformer-based Framework for Sentiment Analysis of Restaurant Reviews	1
4	Optimizing EEG-based Microsleep Detection: A Comparative Analysis of Time and Frequency Domain Features Utilizing SVM	7
8	Design of A Dual Band Microstrip Patch Antenna for 5G mm-Wave Applications	12
11	Performance Evaluation of Hybrid AC/DC Microgrids with Integrated Renewable Energy	16
12	Enhancing Bangla Language Text Recognition in OCR using Levenshtein Distance and Character Grouping Strategy	22
14	The Information Bottleneck Method in Deep Learning: Principles, Applications, and Challenges	28
23	Automated Detection of Image-Based Abusive Bengali Memes Using Ensemble and Deep Learning Models	34
24	BDNEWS: Advance Bengali Sensitivity Corpus and Classifiers	39
25	Optimizing Round Robin Scheduling with DBSCAN Clustering and Machine Learning	45
27	Design and Analysis of a Miniaturized, Efficient Wideband THz Antenna for 6G Applications	51
28	Performance Analysis of FACsSnI3 Perovskite Solar Cells: Variations in Electron Affinity and Defect Density with Different ETLs	56
33	Optimizing k-means for the Deployment of UAV-Assisted Wireless Networks: A Parametric Analysis	61
35	SPEI Based Drought Prediction and Validation Using Machine Learning Algorithm in Bangladesh from 1981 to 2017.	66
36	Breaking Efficiency Barriers: Triple Absorber Layer Solar Cells with Over 36% Efficiency	71
38	Predicting Endotracheal Suctioning Activities Based On Skeletal Coordinates: A Novel Approach Combining Handcrafted Feature Engineering and Ensemble Learning	76
40	Machine Learning Techniques for Brain Stroke Analysis and Prediction	81
43	Efficient Implementation of Group Operations for Elliptic Curve Cryptography	87
45	Retrieving Top k% Relevant Patterns for Relation Extraction in Bangla using Distant Supervision	91
46	An Explainable Educational Data Mining System for Predicting Student Academic Performance	96
47	Shallow Feature Based Image-Text Retrieval Using Kernel Extreme Learning Machine	101
48	A Sustainable RF-Based Wireless Power Transfer System for Medical Applications	107
50	Cat-CNN: Human Eye Cataract Detection from Color Fundus Photograph with Deep	113

Organized by



Hosted by



#### 2024 IEEE International Conference on Signal Processing, Information, Communication and Systems (SPICSCON) 1-2 November 2024, Khulna University, Khulna, Bangladesh

### **Table of Contents**

Paper ID	Paper Title	Page #
	CNN with Optimized Cascaded Network	
51	Performance Analysis of a Compact Wideband Metamaterial Absorber for Radar and Satellite Communications at Ku and K Bands	119
52	A Numerical Analysis for Optimization of MoTe2/Sb2S3 Heterojunction Structure for High-Efficiency Solar Cell	125
53	Development of a System to Prioritize Sustainable Energy Solutions Utilizing Double-Stage Optimization Techniques: A Case Study of Rajshahi, Bangladesh	131
55	Prediction of Rainfall in Sylhet Using Machine Learning Approach	137
56	Enhancing Urban Traffic Management with Real-Time Computer Vision and AI: A Smart Traffic Signal System	142
57	Design of a Quadruple Band Metamaterial Absorber for Sensing in the Terahertz Region	148
62	Detection of Voice Disorder Using Spectral and Statistical Audio Features and SVM-RBF	153
63	A New Approach for Detecting Sleep Arousal from Single-Channel EMG Signal	157
64	An Efficient Algorithm for Detecting Total Sleep Time from Electroencephalography Signal	161
67	MODELING THE SHARING AND DIFFUSION OF FAKE NEWS IN SOCIAL MEDIA	166
68	Study of Single Crystalline Silicon Growth on Graphene Using Density Functional Theory	171
70	A CMOS Instrumentation Amplifier for Photoacoustic Signal Measurement	175
72	Enhanced SDN Defense: Analysis of DDoS Attack Detection Techniques using Machine Learning	180
74	Enhanced YOLOv9-Based Endangered Tiger Detection Framework for Wildlife Surveillance	185
76	Design and Simulation of a PCF-SPR Biosensor for Enhanced Blood Cancer Detection	190
79	Comparative Analysis of MVDR Beamformer with Conventional Beamformer for the Efficient Interference Reduction by Null-Forming for Radar Applications	194
81	EmoTech: A Multi-modal Speech Emotion Recognition Using Multi-source Low-level Information with Hybrid Recurrent Network	199
83	A Comparative Study on Plant Disease Detection Using Deep Learning Techniques	204
85	Design and Analysis of CMOS-based Common Source and Cascode Amplifiers Using 90 nm Technology	208
90	Hardware Implementation of Area-Time Efficient Modular Multiplication over NIST Prime Fields	214
91	Recognition of Bengali Vowels from Auditory Evoked Potentials Using CNN	219

Organized by



Hosted by





#### 2024 IEEE International Conference on Signal Processing, Information, Communication and Systems (SPICSCON) 1-2 November 2024, Khulna University, Khulna, Bangladesh

### **Table of Contents**

Paper ID	Paper Title	Page #
92	Multi-Class Brain Tumour Classification with CNN on MRI Scans	225
95	SwiftCNN: A Deep Learning Model for B-ALL Diagnosis and Subtype Classification from Blood Smear Images	231
98	LVQE: Laparoscopic Video Quality Enhancement Using GAN-Based Smoke Elimination Guided by an Embedded Dark Channel	236
102	Enhancing Cybersecurity through Genetic Algorithm-Based Phishing Website Detection	242
104	Precision Navigation: Dual Band GPS Receiver with Phased Array Technology and Directional Antenna	248
105	Enhancing Anomaly Detection in Chipless RFID Systems: A GAN-based Approach	253
108	Achieving 40.34% Efficiency in KGeCl3 Solar Cells with Ag2S ETL and Cu2O HTL via SCAPS 1D Simulation Optimisation	258
110	An IoT-Based Calculator for Body Mass Index Determination	263
112	Detection of Carbonated Beverages using a PCF SPR Sensor	267
118	PCA-Enhanced Deep Learning Method for Network Intrusion Detection: A Multi-Label Classification Approach	273
127	CyHy: A Centrality-aware Hybrid Caching Strategy in Information-centric Networking	278
136	Estimating Response of Fractional Order Systems and Control: An Orthogonal HF-Based Approach	284
138	Enhancing Healthcare Precision: Utilizing Machine Learning for Accurate Patient Age Group Prediction	290
139	Transfer Learning Technique for Brain Tumor Classification from MRI Images	296
140	Modified InceptionV3 Model for Brain Tumor Classification with Grad-CAM Explainability	302
143	COVID-19 Detection from Cough Sound Signal using Random Forest Learning of Deep Spectral Features	307
149	A Regularized LSTM Method for Detecting Fake News Articles	311
153	A Novel CNN Architecture for Alzheimer's Disease Classification Using MRI Images: Comparison with Traditional Machine Learning Models	317
154	Detection of DDoS Attack: A Comparative Evaluation of Machine Learning Techniques	323
157	Design and Implementation of IoT-Based Manhole Management System	329
160	Advancing Wearable Electronics via Shoe-Integrated Piezoelectric Energy Harvesting	335

Organized by



