

2025 10th International Conference on Information Technology Research (ICITR 2025)

**Colombo, Sri Lanka
8-11 December 2025**

IEEE Catalog Number:
ISBN:

CFP25BAE-POD
979-8-3315-5093-6



Copyright © 2025, IEEE

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:	CFP25BAE-POD
ISBN (Print-On-Demand):	979-8-3315-5093-6
ISBN (Online):	979-8-3315-5092-9
ISSN:	2831-3380

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

TABLE OF CONTENTS

A Multi-Language Cognitive And Structural Complexity Analysis And Optimization Framework	1
<i>P Vishaliny</i>	
Knapsack based Delay Tolerant Resource Allocations in Trusted Fog Edge Cloud Systems	7
<i>U S Premarathne, S. Rajasingham</i>	
Parallel Recursive Decomposition for Maximal Clique Enumeration on Multicore Systems	13
<i>Sangeetha Mahendran, Thuvaajini Ariyamuththu, Nagulan Ratnarajah</i>	
GSM-SR: Generalized Structure-Informed Multi-Scale GAN for Efficient Image Super-Resolution	19
<i>H. K. G. V. L. Wickramarathna, M. A. R. Prabashwara, K. O. S. Perera, U. Thayasivam</i>	
A Kinetic Theory-Based Approach To Modeling Dengue Transmission	25
<i>Sandali Hansika, Hasitha Erandi, Chaditha Attanayake, Sanjeewa Perera</i>	
Classification of Alzheimer's Disease using Multilayer Graph Attention Neural Networks and Multimodal Neuroimaging	31
<i>Hariharan Ilakkanakumaran, Pavithira Sivasothy, Logiraj Kumaralingam, Subaramya Srivishagan Nagulan Ratnarajah</i>	
A Fuzzy-AHP Decision Model for Flood Hazard Prioritization in Sri Lanka	37
<i>L.K.D. Madhushani, I.T.S. Piyatilake</i>	
Parameter Efficient Fine-Tuning of LLMs Enhanced with RAG to Assist Students with Lectures	43
<i>Ilma Jiyadh, S. Thirukumaran, Nagulan Ratnarajah</i>	
Paddy Land Segmentation and Estimation Using U-Net and SAM with Satellite Imagery: A Sri Lankan Study	49
<i>Tharsika Jegatheeswaran, Ayodhya Herath, Logiraj Kumaralingam, Keerthanaram Thanabalasingam Jeyamugan Thirunavukkarasu, Nagulan Ratnarajah</i>	
Sri Lankan Seagrass Families Identification using Underwater Images through Image Enhancement and Deep Learning Techniques	55
<i>Diluxshan Jogasinkam, Athiththan Vasanthan, Tuvensha Jegatheeswaran, Keerthanaram Thanabalasingam Jeyamugan Thirunavukkarasu, Nagulan Ratnarajah</i>	
Computer-Integrated Design of a Prosthetic Hand for Activities of Daily Living	61
<i>R.A.G.M. Gunawardhana, R.A.R.C. Gopura, R.K.P.S. Ranaweera</i>	
Multimodal Diagnostic Approach for Domestic Animal Health: Integrating Blood Analysis, Urine Analysis, and Cardiac Parameter Monitoring in Cats and Dogs	67
<i>R.M. Udavith Reshanjana, P.P.G. Dinesh Asanka, A.D. Rajapaksha</i>	
GPT-5 Enabled Real-Time Contour Mapping for Interactive Terrain Monitoring under Sea-Level-Rise Scenarios	73
<i>T. D. P. Liyanage, M. K. S. Kaushalya, H. M. K. K. M. B. Herath, S. L. P. Yasakethu</i>	
AI-Generated Image Detection Using Hybrid Feature Extraction	79
<i>Aysha Ramzy, Mohamed Fazil Mohamed Firdhous</i>	
AI Generated Audio Detection Using Acoustic Audio Features	84
<i>Mohamed Fayik Fathima Nuska, Mohamed Fazil Mohamed Firdhous</i>	

Hybrid Deepfake Detection Using Vision Transformer and ConvNeXt Fusion	90
<i>Vishaal Shanmugarajah, Yasas Jayaweera</i>	
Real-Time Control and Monitoring of Decentralized Solar Energy Systems Using IoT and GPS Integration	96
<i>D.M.K.I. Dissanayake, H.G.S. Priyankara, D. L. Ruberu, L.V. W. Muniweera, V. O. Mahendra Malith Erandaka</i>	
Multi-Criteria Decision Making Framework for Ranking Machine Learning Models	102
<i>E.A.T. Madhuwanthi, N.G.S.S. Nanayakkara, W.T Dinuprabha, I.T.S. Piyatilake</i>	
Digital Transformation of Blood Bank Operations: Design and Implementation of a National Blood Bank Management System	108
<i>Onaliy Vinukiy Jayawardana, Mohamed Sapraz</i>	
Dynamic Cluster Specific Ensembles with Explainable AI for Flood Hazard Prediction	114
<i>M.H.D. Bumuth Gajakum, Priyanga Dilini Talagala, Dilumika Chandrasiri</i>	
Fuzzy Logic-Based Landslide Susceptibility Mapping in the Kalu Ganga Basin, Sri Lanka	120
<i>Kaveesha Gimhani, Sanjeewa Perera, Prabhath Liyanage, Hasitha Erandi, Mihira Lakruwan</i>	
Microscopy Image-Based Machine Learning Framework for Natural and Synthetic Sapphire Classification	126
<i>S.Thadsha, L.Mathumila, S.Mahizhnan, R.G.C Jaliya, D.P.Jayathunga, M.Janotheepan Murugaiya Ramashini</i>	
Early Prediction of Severe Dengue Using Machine Learning	132
<i>JV Halwala, SD Perera, Uvini Ranaweera, Shehan Silva</i>	
AI-Aided Financial Analytics Dashboard for High-Frequency Traders	138
<i>Udari de Silva, Sanjeewa Perera, Uditha Prabhath Liyanage, Hasitha Erandi</i>	
Hybrid Feature-Hash Module for Image Duplicate Detection	144
<i>W.P.C.P. Pathirana, Priyanga Dilini Talagala</i>	
An Intelligent Hybrid Food Recommendation System for Chronic Kidney Disease Management: Integrating Clinical Guidelines, Personal Preferences, and Explainable AI	150
<i>Nethmi Kavindya, Malithi Abayadeera, Shamly Shanawaz, G. Upeksha Ganegoda, Thanuja C. Sandanayake</i>	
Explainable Predictive Analysis for Parkinson's Disease (PD)	155
<i>Lsga Pathirathna, Bnnt Batagoda, Nipuni Chandimali</i>	
Modified Red Piranha Optimization (RPO) with Adaptive Search Space	160
<i>Lakshana Wickramasinghe, Kushani De Silva</i>	
AI-enabled Vision Attentive System for Detection of Emotional Anxiety and Digital Fatigue among University Students	166
<i>A. G. M. S. Gunawardhana, G. G. K. N. Madhubhashini, H. M. K. K. M. B. Herath, S. L. P. Yasakethu</i>	
Complexity-Aware Food Volume Estimation: An Adaptive Algorithmic Approach for Mobile Dietary Assessment	172
<i>M. Shamly Shanawaz, Malithi R. Abayadeera, K.D. Nethmi Kavindya, G. Upeksha Ganegoda Thanuja C. Sandanayake</i>	

Explainable Predictive Analysis for Coronary Artery Disease (CAD)	178
<i>Gva Isuri Weerathne, Bnnt Batagoda, Nipuni Chandimali</i>	
Pre-Trained Multilingual Models for Low-Resource Sinhala Automatic Speech Recognition Enhancement	184
<i>Inuri Harischandra, Sasangi Nayanathara, Thamira Weerakoon, Randil Pushpananda, Ruvan Weerasinghe</i>	
Document Analysis Software for Construction Domain: DoCon AI	190
<i>Sehara Arunodya Fernando, Lahiruni Meegama, Ashini Dananjana, Laavanjan, K A Dilini T Kulawansa Shashika Janith, Lesly Ekanayake, N.M.M. Nihaaj</i>	
Connecting the Dots: Graph Diffusion based Framework for Person Re-Identification	196
<i>Dulith Chinthaka, Subha Fernando</i>	
Real-Time People Counting and Occupancy Monitoring using Integrated CCTV Systems	202
<i>D.M.K.I. Dissanayake, V. O. Mahendra, R.S.M.P.W. Rathnayake</i>	
Hybrid CNN-HOG Feature Fusion with Attention Mechanisms and SVM for Accurate Brain Tumor Diagnosis	208
<i>Hamdha Mager, C.R.J. Amalraj, G.Kaushalya</i>	
Forecasting Urban Air Pollution in Sri Lanka Using GARCH Model for Effective Air Quality Management	214
<i>Maduwanthi DMSK, Piyatilake ITS, Jayathunga HCY</i>	
Classification of Insomnia and Healthy Adults Based on EEG Spectral Characteristics Across NREM and REM Sleep	220
<i>Nilantha Premakumara, Chan-Yun Yang, Kuo-Wei Chen, Hao-Neng Fu, Tzu-Hsuan Tsai, Ping-Tse Lee Ting-Wei Huang</i>	
Design of a Hardware Based Security Framework for Generic IOT Device Authentication Using PUF	225
<i>N.R. Anne Princess, U.S. Premarathne</i>	
Towards a Unified Framework for Digital Platforms and Knowledge Sharing in Agile IT Environments	230
<i>Vimeshi Silva, Thanuja Sandanayake, Dinesh Samarasinghe, Chathura Ranaweera</i>	
Exploring Prompting Techniques in Large Language Models for Sinhala Online Misinformation Detection	236
<i>Nipuni Premadasa, Thilina Thanthriwatta</i>	
Integrating AI and IoT for Smart Home Energy Management	242
<i>Siriwardhana S.M.D.S., Pivithuru N.H.A.S., Welikalage R.Y.W., Balasuriya B.L.I.S., Dinithi Pandithage Ashvinda Iddamalgoda, Sanika Wijayasekara</i>	
EnFauna: An Integrated AI-Powered Computer Vision Platform for Crowdsourced Species Identification, Awareness, Reporting, and Fundraising in Endangered Wildlife Conservation in Sri Lanka	248
<i>Abeynayake K G, Dilpriya T A H</i>	
An Explainable AI-Based Ensemble Deep Learning Method for Precise Diagnosis of Kidney Disease from CT Images	254
<i>Heshan Chandeepea Pathmakumara, Gayan Perera</i>	

A Hybrid XAI-LLM Approach for Generating Explainable Feedback in an Intelligent Technical Interview Simulator	260
<i>W.M.S Wijethunga, W.M.R.M Wijesuriya</i>	
JS/TS-Smell: A Metric-Enriched Dataset for Code Smells and Anti-Patterns in JavaScript and TypeScript	266
<i>Y.V.A.Amarasinghe, P.P.G.Dinesh Asanka, Dilani Wickramaarachchi</i>	
Machine Learning for Effective Pest Detection in <i>Mangifera indica</i> (Mango) Crop Protection	272
<i>Sankeetha Vamadevan, Agalya Vinoharan, Veerapathirapillai Vinoharan</i>	
Automated Speed Limit Violation Detection System Using Computer Vision and Deep Learning	278
<i>A.K.B. Nanayakkara, G.U. Ganegoda</i>	
AI-Assisted Criminal Investigations: Enhancing Testimony Analysis and Case Correlation	284
<i>K.A.D. Karunarathna, E.R.L.C. Ediriweera, N.D.R.N. Fernando, B.A.I.S. Abeywardana Lakmini Abeywardhana</i>	
AC-TRP: Architecture-Compatible, Causal-Informed Temporal Relevance Propagation Framework for Robust Time Series Analysis	290
<i>Mohammed Hashim Kalam, Guhanathan Poravi</i>	
Detecting Body-Shaming Content in Sinhala and Romanized Sinhala on Social Media	296
<i>Githmi Parana Hewage, Thilina Thanthriwatta</i>	
Archelon AI: Programming Assistant for Legacy Codebases	302
<i>T. T. L. Denuri, S. Ragukanthan, W. A. D. N. Wijesekara, M. D. Prageeth, A.T. P. Silva, L. Attanayaka</i>	
Enhancing Security and User Experience in Web-Based Applications Through a Multi-Mechanism Authentication	308
<i>Ishara K.G.R.U, Kanishka Yapa</i>	
A Statistical Analysis of Factors Influencing Kidney Transplant Outcomes	314
<i>W. P. Anjalee Shalika Wijesekara, A. L. A. R. R. Thanuja</i>	
Dynamic Node Addition for SDN-Enabled Cloud-Based Wireless Sensor Networks	320
<i>W.A.G. Nilnuwani</i>	
Integrated Deep Learning, Machine Learning and Environmental Analytics for Sugarcane Variety Classification, Maturity Assessment, and Sugar Production Prediction: A Case Study at Lanka Sugar Factory, Pelwatte	326
<i>Sewmini Rathnayaka, Sasith Jayaweera, Lakruwan Jayathissa, Kavindu Fernando, Nisal Nandasena Kasun Rathnayaka</i>	
Enhancing the Arithmetic Optimization Algorithm for Robot Path Planning in Dynamic Environments	332
<i>G.H.C. Madushani, I.T.S. Piyatilake</i>	
DQN-Based Framework for EEG based Stress Detection	338
<i>S.M.R.B. Saluwadana, Thushari Silva</i>	
Voice and Face-Based Mood Recognition for Personalized Recommendations	344
<i>A.M.N.P Jayasekara, H.W.C. Ganishka, A.A.I. Udani, H.M.I. Udayangani, S. Upeksha, I. Karunaratne</i>	

AI Driven Smart Tourism Platform for Personalized Safe and Sustainable Travel Planning	350
<i>Shobithaa Srikanthan, Chanidu Senevirathne, Thuwakaran Rasarathnam, Thilini Jayalath</i>	
<i>Karthiga Rajendran</i>	
AI-Driven Automata Transformations	356
<i>D.M.C.P Dissanayaka, A.K.I Madushan, P.S. Jayasinghe, S.S. Galappaththi, I.T.S. Piyatilake</i>	
<i>C.P. Wijesiriwardana</i>	
Grade 6 Coding Education through Interactive Learning in Sri Lanka	362
<i>Santhushie Nallaperuma, Avishka Perera, Naduka Nanayakkara, Dihan Hansaja, Jenny Krishara</i>	
<i>Dinuka Wijendra</i>	
AirSense: AI-Powered Air Mouse Using TinyML	368
<i>H.W.T.P. Pasandul, B.H. Sudantha</i>	
Assessing Export Performance in Sri Lankan Agriculture: A Stochastic Frontier Approach to the Gravity Model	373
<i>Hashan S. Wimalasiri, Tiloka De Silva, Indra Mahakalanda</i>	
DEMT: Diffusion-Enhanced Multi-Modal Transformer for Bone Fracture Detection	379
<i>Janarthan V, Vasavan M, Luxshi K</i>	
Modeling the Influence of Mobile Connectivity on Digital Learning Behaviors among Urban Generation Z in Sri Lanka	385
<i>G. H. B. A. De Silva, T. C. Sandanayake, M. F. M. Firdhous</i>	