

2024 9th International Conference on Information Technology Research (ICITR 2024)

**Colombo, Sri Lanka
5-6 December 2024**



**IEEE Catalog Number: CFP24BAE-POD
ISBN: 979-8-3315-1143-2**

**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:	CFP24BAE-POD
ISBN (Print-On-Demand):	979-8-3315-1143-2
ISBN (Online):	979-8-3315-1142-5
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

CURRAN ASSOCIATES INC.
proceedings
.com

TABLE OF CONTENTS

Explainable AI-Driven Framework for Gemstone Quality Assessment	1
<i>H D H Malintha Perera, B M Adithya Heshan, K. L. Pabasara Kavindi, P Ravindu Dilusha, Dharshana Kasthurirathna, H. M. Samadhi Chathuranga Rathnayake</i>	
Early Prevention of Cardiovascular Disease: A Review of Technology, Risk Scoring, and Non-Invasive Methods	7
<i>Nilantha Premakumara, Hao-Ting Cheng, Kuo-Wei Chen, Hao-Neng Fu, Xian-Yi Chen, Chan-Yun Yang</i>	
Email Armour: A Multi-Layered Email Defense Solution	13
<i>K. T. A. U Lakmal, L. M. C Perera, S. P. K Padmika, S. P. A De Silva, Dinithi Pandithage, Deemantha Siriwardana</i>	
Examining Information Diffusion Patterns in YouTube Comment Networks, a Social Network Analysis Approach	19
<i>Amila Chethana Nanayakkara, Banage T. G. S. Kumara, R. M. Kapila Tharanga Rathnayaka</i>	
Advanced Plant Growth Recognition Model with Deep Learning for the Coconut Tissue Culture	25
<i>N. Sathisrajan, H. M. A. Chandeepp, S. C Rathnayake, Samitha Vidhanaarachchi, V. R. M. Vidhanaarachchi</i>	
Enhanced Detection of Evil Twin Attacks in Public Wi-Fi Networks Using Machine Learning Algorithms.....	31
<i>J. D. A. S. K. Nanayakkara, M. M. P. R. M. Bandara, M. S. Mawjood, R. A. P. M. Perera, Kavinga Yapa, Deemantha Siriwardana</i>	
TripTractix: Optimizing Outing Planning with Advanced Computational Techniques	37
<i>Faizan Muthaliff, T. G. D. K. Sumanathilaka</i>	
Enhancement of Image Based Human Action Recognition Using Transfer Learning with Pre-Trained CNN Architectures	43
<i>K. A. N. C. Kanangama, S. Thirukumaran</i>	
Adaptive Particle Swarm Optimization for Enhanced Convolutional Neural Network Model Training	49
<i>A. W. C. K. Atugoda, Subha Fernando</i>	
Fake News Detection on Twitter	53
<i>B. C. Uyanage, G. U. Ganegoda</i>	
Electromagnetic Insights Acquisition Through a Forensics-As-A-Service Platform	59
<i>Senal Punsara, Dinil Ratnayake, Janitha Devin Ratnayake, Asanka Sayakkara, Akila Wickramasekara</i>	
Layout Aware Research Paper Parsing and Draft Research Paper Layout-Error Detection Using NLP and Rule-based Techniques	65
<i>Naveen Hedalla Arachchi, Ranul Navojith Dayarathne, Nipuna Dilshan Aluthdeniya, Wanuja Ranasinghe, Gamage Upeksha Ganegoda</i>	
A Machine Learning Framework for Accurate Skin Tone, Type, and Disease Detection with Web Scraping and NLP for Dermatological Insights.....	71
<i>Lakshana Kugaraj, D. M. G. T. Dassanayake, Karthiga Rajendran</i>	

Saliency-Based Token Swap - a Language-Agnostic Data Augmentation Method for Text Classification	77
<i>Hiroshan Ilangeshwaran, Lakmini Abeywardhana, Samadhi Rathnayake</i>	
Tacit Knowledge-Based Expert Model for Decision Support in Injection Mould Design	82
<i>K. H. J. Mangala, R. K. P. S. Ranaweera, H. K. G. Punchihewa</i>	
Determining the Risk of Natural Disasters in Sri Lanka Using Fuzzy-AHP	88
<i>L. K. D. Madhushani, I. T. S. Piyatilake</i>	
Real Time Crime Data Analysis with Hadoop and MapReduce: A Case Study from Sri Lanka	94
<i>Dhanuka Dayawansa, Hamza Nauzad, Sithara Kumarasingha, Uthpala Isuranga, Prasanna S. Haddela, Samadhi Rathnayake</i>	
Voicense: AI-Powered Lecture Note Generation Tool.....	100
<i>A. W. R. P. Karunarathna, T. U. M. N. Premarathna, R. G. S. Dilshan, W. A. K. H. R. Wanniarachchi, Y. M. C. N. Bimsara, I. T. S. Piyatilake</i>	
AI Assisted Diagnosis of Dengue Amid Arboviral Diseases, Severity Prediction, and Post Effects.....	106
<i>Nivasheni B, Fernando V. G. S. O., Srihari M, Sarah M. I. L., Vishan Jayasinghearachchi, Samadhi Chathuranga Rathnayake</i>	
Analyzing the Influence of Automated Water Distribution Systems on Precision Irrigation for Orchids: A Case Study Using Dendrobium Phalaenopsis Orchid Group	112
<i>R. P. G. S. Maleesha, P. D. Suranjini Silva</i>	
Identification of Sales Order Number Using Long Short-Term Memory	118
<i>W. A. D. U. Wijesinghe, L. D. C. S. Subhashini, H. A. D. U. Perera</i>	
Enhanced Analysis of Media Interactions During Sociopolitical Unrest: Cross-Correlation Case Study of South African Unrest 2021	124
<i>Amila Chethana Nanayakkara, Banage T. G. S. Kumara, R. M. Kapila Tharanga Rathnayaka</i>	
Software Quality Assurance Practices Towards Waterfall and Agile Information Systems Projects of BOI Registered Software Companies in Sri Lanka	130
<i>A. L. C. D. Pathiraja</i>	
Optimizing YouTube Video Discoverability Through Trend Analysis and Hashtag Generation.....	134
<i>Chamodhya Manawathilake, Gamage Upeksha Ganegoda</i>	
Cognitive-Integrated Complexity Analysis: A Comprehensive Software Visualization Tool.....	140
<i>Kasun R. Sampath, Dilshan I. De Silva</i>	
Enhancing Text Segmentation with Positional Encoding and Sentence Embeddings: An Unsupervised Clustering Approach	146
<i>C. D. R. M. Weerasinghe, M. R. A. A. K. Gunasinghe, H. B. K. S. Siriwardana, Indika Perera</i>	
Few-Shot Melanoma Stage Classification with Siamese Networks and ResNet Encoders: A Focus on Data Leakage Prevention.....	152
<i>Menaka Mohanakumar, C. R. J. Amalraj, P. G. S. Upeksha</i>	
Tactile Device for Braille-Based Communication in Inclusive Education	158
<i>H. L. A. I. Udana, B. M. N. U. Mendis, H. M. K. K. M. B. Herath, S. L. P. Yasakethu, Udes S. Oruthota</i>	
Metaverse to Enhance Experimental Learning in Higher Education.....	164
<i>M. H. M. Wickramasinghe, S. R. Liyanage</i>	

Early Diagnosis of Alzheimer's Disease from MRI Images Using Machine Learning Approach	170
<i>W. M. R. M Wijesuriya</i>	
UAV-Based Building Crack Detection Using Convolution Neural Networks	176
<i>D. M. K. I. Dissanayake, R. S. M. P. W. Rathnayake, N. T. A. Sathsara, Chathurika S. Silva</i>	
Autonomous Detection and Removal of Paddy Weeds Using Computer Vision and Deep Learning	182
<i>T. H. Warnakulasooriya, E. M. U. S. Bandara, N. D. P. Wanigasuriya, Chathurika S. Silva</i>	
SingRAG: A Translation-Augmented Framework for Code-Mixed Singlish Processing	188
<i>S. M. M. Rukshan J. Senanayaka, A. W. A. D. Nethmin Dulsara Abeysekara, M. G. Nipuni Nikeskala Premadasa</i>	
Classification of Sri Lankan Skin Diseases Using Ensemble Deep Learning Models	194
<i>Kayalvizhy Thapalingasivam, Veerapathirapillai Vinoharan, Pirabakaran Sivanesan</i>	
A Deep Learning Based Freestyle Swimming Stroke Posture Analysis and Feedback System	200
<i>Amandi Jayawardene, Pradeep Kalansooriya</i>	
Enhanced Change and Anomaly Detection for Intelligent Video Surveillance Systems*	206
<i>Siyumi Pathirana, Shafa Bishirhafi, Paboda Ratnayake, Kavinda Sandaruwan, Lakmini Abeywardhana, Dharshana Kasthurirathna</i>	
Trajectory-Based Anomaly Detection in Highway Traffic Surveillance Videos Using Unsupervised Learning Techniques	212
<i>G. W. P. R. R. Wijesinghe, W. S. T. Sandaruwan, N. T. M. Sajith, M. N. M. Aashiq</i>	
Enhancing Software Security Visualization Through Adaptive Level of Detail (LoD) Mechanisms: A City Metaphor-Based Approach	218
<i>Ishara Devendra, Chaman Wijesiriwardana, Prasad Wimalaratne</i>	
CataLight: A Novel Lightweight Approach for Cataract Severity Detection Using Digital Imaging on Edge Devices	224
<i>Kavindhya De Silva, Uthpala Sooriya-Arachchi, Rasanjalee Rathnayake</i>	
Classification of Defects of Cotton Yarns Using Convolutional Neural Networks	230
<i>S. H. A. Arachchi, P. H. K. Vidushka, S. N. Niles, R. P. Abeysooriya</i>	
Developing a Dysgraphia Handwriting Dataset for Early Detection of Dysgraphia in Sinhala-Speaking Children	236
<i>Sandushi Weraduwa, Dinesh Asanka, Thilini Mahanama, Swarna Wijeatunge</i>	
IDeploySmart: A Machine Learning-Based Approach for Predicting the Deployment Type of Identity Servers	242
<i>Mamoru D. L. S., Amjadh Ifthikar</i>	
Image-Based Cryptocurrency Trend Prediction with Explainable Deep Learning	248
<i>Shavin Fernando, Nethmi Wijesinghe</i>	
Hybrid Predictive Model for Efficiency Forecasting in Garment Production: Integrating Ensemble and Time-Series Approaches	254
<i>Zamith Ahamed, Ppg Dinesh Asanka, Chathura Rajapakse</i>	
AI-Based Early Intervention for Enhancing Facial Emotion Recognition in Children with Autism Spectrum Disorder in Sri Lanka	260
<i>H. K. C. D. Kavikeshawa</i>	

IOT Based Smart Plant Growing and Caring Platform for Urban Environments.....	266
<i>La. S. Ilangaweera, S. E. M. H. Naramada, N. T. M. Sajith, M. N. M. Aashiq, M. N. A. Hinas</i>	
Real-Time Motion Detection for Language Translation and Literacy Enhancement in Hearing-Impaired Children.....	272
<i>Navodya K. T., H. M. O. C. B. Herath, K. D. S. Sandeepanee, R. G. P. T. Rajapaksha, Wishalya Tissera, Samitha Vidhanaarachchi, Hansi De Silva</i>	
An Integrated Framework for Self-Adjusting Temperature, Humidity, and Airflow Direction in Smart Air Conditioning Systems	278
<i>Hiruni Saparamadu, Nuwani Dilara, Thamasha Bandara, Anialika Meriyan, Jenny Krishara, Samadhi Rathnayake</i>	
Distributed Deep Neural Networks Training in a Multi-Worker Environment	284
<i>Gowsikan Nakuleswaran, Jathurshan Sownthararasa, Jananie Jarachanthan</i>	
Kills Or Turrets: An Exploratory Data Analysis and Win Prediction of League of Legends Based on Early-Game Data.....	290
<i>Minandi Wilathgamuwa</i>	
Improving Class Imbalance in the Classification of Multi-Dimensional Data: Interpretable Model Design and Evaluation.....	296
<i>Gayathri Sivakumar, Chambavy Balasundaram, Vithursan Thevendran, Priyanga Dilini Talagala</i>	
K8s Pro Sentinel: Extend Secret Security in Kubernetes Cluster.....	302
<i>Kavindu Gunathilake, Indrajith Ekanayake</i>	
Enhancing Human Safety Through Early Detection of Floods and Landslides in Sri Lanka.....	307
<i>Karunawardhana K. P. I, Munasinghe S. P, Samiru J. G. S, E. M. H. K. B. Ekanayake, Nelum Chathuranga Amarasena</i>	
An Analysis of Readability of Sri Lankan Short Stories Generated by Large Language Models	313
<i>Sandaruwani Pathirage, Thilina Thanthriwatta</i>	
Galaxy Clustering and Classification Using Machine Learning Algorithms and XAI.....	319
<i>Amasha Elvitigala, U Dani Navaratne, Samadhi Rathnayake, Kapila Dissanayaka</i>	
Enhancing Demand Forecasting in Food Manufacturing: Hierarchical Analysis of Aggregated and Individual Models.....	325
<i>Achala Hasini Perera, Priyanga Dilini Talagala, H. Niles Perera, Amila Thibbotuwawa</i>	
Fishing Location and Availability Prediction for Yellowfin Tuna in Sri Lanka.....	331
<i>Tharmalingam N., Arulanathan I., Sharmini R., A. L. A. R. R. Thanuja</i>	
Generalized Meta Framework for Forecasting	337
<i>Theepana Govintharajah, Pavadarana Pathmaranjan, Gowsigan Kanagalingam, Priyanga Dilini Talagala</i>	
Optimal Allocation of Vaccines in a Meta-Population to Control COVID-19 in Sri Lanka.....	343
<i>A. U. S. Adikari, H. C. Y. Jayathunga</i>	
Impact on Celebrity Endorsement Essentials on Brand Awareness and Purchase Intention in Men's Wear Industry in Sri Lanka.....	349
<i>Thisari Kavisha Hettiarachchi, Rivini Mataraarachchi, Ranga Abeysooriya</i>	

Key Situation Awareness Requirements for Aspirants in the it Sector in Sri Lanka: An Expert Interview Approach	355
<i>B. L. M. Dananjaya, M. B. Mufitha, T. C. Sandanayake, P. G. S. Upeksha</i>	
Artista - a Digital Art Marketplace	361
<i>Buddhi Bandara, Gihan Jayathissa, Dhanushka Karunarathna, Janani Siriwardane, Kaumi Nethma, K. A. Dilini T. Kulawansa, Randima Lahiru</i>	
Blockchain in Healthcare: Introducing Novel Proof of Accountability Voting (PoAV) Consensus Algorithm and Custom Blockchain Network	367
<i>G. L. Kodithuwakku, Ksd Fernando</i>	
Popularity Prediction of Sinhala YouTube Videos.....	373
<i>C. L. Gunawardana, K. D. Thamarasee</i>	
Smartwatch-Based Gait Authentication Using Siamese LSTM Networks	378
<i>Rumeth Rombage, Nuwan Jayawardene</i>	
A Comprehensive Location-Based Travel Forum and Service Network for Promoting Responsible Tourism and Enhancing Safety in Sri Lanka	383
<i>Sandunika Subasinghe, Imasha Gamage, Harendra Samarawickrama, Pathum Weerasooriya, Kapila Dissanayaka, Junius Anjana</i>	
CodeSafari: A Customized Mobile Solution for Introducing Programming Concepts to Children.....	388
<i>Fahmi M. F. A., Sanjeevan M. C. M. A., Samanthi E. R. Siriwardana, Mihiri Samaraweera</i>	
Adaptive Learning System for Enhancing Mathematical Aptitude in the Sri Lankan O-Level Education System	394
<i>N. J. T. A. G. R. A Jayasuriya, T. C. Hettihamu, N. H. Manimendra</i>	
Intelligent CCTV-Based Motorbike Theft Detection System in Bike Parks with 3D Slot Identification and Posture Monitoring.....	399
<i>W. A. P. N. Weerasinghe, N. H. Kalupahana, Shifak M. R. M, W. M. D. P Gunathilake, Harinda Fernando, Samanthi E. R Siriwardana</i>	
Early Disease Outbreak Detection in Spatio-Temporal Data Using Predictive Modeling and Extreme Value Theory	405
<i>E. G. M. A. Senevirathne, Priyanga D. Talagala</i>	
Tamil Alphabet Sign Language Recognition Using Mediapipe and Machine Learning.....	411
<i>Vidura Perera, Vijayakanthan Ganesalingam, Vaishali Ravi, Jeyamugan Thirunavukkarasu</i>	
Advanced Machine Learning Methods for the Study of Globular Clusters in Virgo and Fornax Galaxies	416
<i>Udani Navaratne, Amasha Elvitigala, Samadhi Rathnayake, Kapila Dissanayaka</i>	
Large Language Model-Based Student Intent Classification for Intelligent Tutoring Systems.....	422
<i>Malshan Keerthichandra, Tharoosha Vihidun, Shanuka Lakshan, Indika Perera</i>	
MyRecommender: Personalized Activity Recommendation Based on Negative Emotions Classification	428
<i>Zaidh Shafraz, Hiroshan Ilangeshwaran, M. R. M Shifan, Chanul Vithanage, Lakmini Abeywardana, Samadhi Rathnayake, Rizka Ismath</i>	

Author Index