

2025 Moratuwa Engineering Research Conference (MERCon 2025)

**Moratuwa, Sri Lanka
14-15 August 2025**

Pages 1-437



**IEEE Catalog Number: CFP25B72-POD
ISBN: 979-8-3315-6725-5**

**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:	CFP25B72-POD
ISBN (Print-On-Demand):	979-8-3315-6725-5
ISBN (Online):	979-8-3315-6724-8
ISSN:	2831-5537

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

Relative Tsunami Vulnerability of Structural Materials Across Tsunami Events	1
<i>U. J. Ukwaththa, W. P. S. Dias</i>	
Optimization of Transport Networks: With Special Reference to Fluctuating Demand for Fisheries	7
<i>Banuka Kularatne, Hasitha Premasiri, Ravindi Jayasundara</i>	
Organizational Capabilities for Implementing Building Information Modeling (BIM) Technology.....	13
<i>Chamath Jayaweera, Amali Wijekoon</i>	
Comparative Effects of Ground Calcium Carbonate and Marble Dust on Morphological and Yield Responses of Corn (Zea Mays) in Acidic Soils	19
<i>Jane F. F. Falceso, Garry V. V. Blancia, Eddie G. Fetalvero, Merian P. Catajay-Mani, Jerome G. Gacu</i>	
Service Process Improvement Through VSM of Lean Six Sigma: A Case Study	25
<i>Vathsala Wickramasinghe, Prasanna Illankoon</i>	
A Machine Learning Approach for Early Detection of Thyroid Disorders in Sri Lankan Women.....	31
<i>W. M. Uresha Senani, S. Thirukumaran, Ranuki R. Arandara, Nagulan Ratnarajah</i>	
Multi-Objective Parameter Optimization of Fabric Adhesive Bonding	37
<i>Shiran Perera, Janaka R. Gamage</i>	
Data Sovereignty in Multi Regional Identity Systems	43
<i>Maduranga Siriwardena, Indika Perera</i>	
Stability Analysis of Expansive Soil Slopes Stabilized with Geogrids	49
<i>Nafar Nifal, Mohamed Nasvi, Chandana Kurukulasuriya</i>	
Can Machine Peeled Cinnamon Fulfil the Requirements of Ceylon Cinnamon Market?	55
<i>Hasith Gunasekara, Shantha Amarasinghe, Janaka Gamage</i>	
Orthogonal Activation with Implicit Group-Aware Bias Learning for Class Imbalance	60
<i>Sukumar Kishanthan, Asela Hevapathige</i>	
Modified Boundary Scan Cell for Faster Continuous Monitoring	66
<i>S. M. Akila Hemal, Subramaniam Thayaparan, Mukunthan Tharmakulasingham</i>	
Co-Pyrolysis of Textile Dyeing Sludge with Waste Cooking Oil: A Dual-Waste Management Approach for Producing Efficient Dye Adsorbent.....	72
<i>Hashini Nayanathara, Timeshi Herath, Chanaka Udayanga, Shakila Pathirana, Jagath Manathunga</i>	
Design of an Automated Visual Inspection Based Railway Track Fault Detection System	78
<i>Kavindu Talagune, Janitha Dambagalla, Hithesh Jayawardana, R. M. Maheshi Ruwanthika</i>	
Enhanced SCanNet with CBAM and Dice Loss for Semantic Change Detection	84
<i>R. M. A. M. B. Ratnayake, W. M. B. S. K. Wijenayake, D. M. U. P. Sumanasekara, G. M. R. I. Godaliyadda, H. M. V. R. Herath, M. P. B. Ekanayake</i>	
Automating the Lower Limb Gait Cycle for Transfemoral Amputee Prosthetics.....	90
<i>Bhanuka Bandara, Anjana Hapugaskumbura, Pasindu Karunaratne, Ravindu Jayasinghe, Surath Gajanayake, Prabath Dissanayake, Sachira Kuruppu</i>	

Optimal Integration of Distributed Generators in Medium-Voltage Radial Distribution Systems using Enhanced Particle Swarm Optimization Algorithm.....	96
<i>M. S. A. M. Saiful Islam, I. M. Ijas Pakeeh, A. I. S. Juhaniya, M. H. Fayas Ahamed</i>	
Design and Experimental Validation of a Non-Invasive Plasma Density Sensor for Plasma-Enhanced Process Reactors	102
<i>Indula Munasinghe, Shashini Kularatne, Iresha Jeewanthi, Subramaniam Thayaparan</i>	
Predicting School Students' Academic Performance using Ensemble Machine Learning Techniques.....	108
<i>A. G. R. Sandeepa, Alroy Mascenghe</i>	
Car Body Damage Detection and Cost Estimation Based on Generative AI.....	114
<i>Shiran Suriyapathiraja, Dinesh Asanka, R. A. C. P. Rajapakse</i>	
Seamless Transition Between Operating Modes in a Microgrid Cluster	120
<i>Sampath Ediriweera, Lidula W. Arachchige</i>	
Optimizing Energy Efficiency in Cloud Environments Through Hybrid Workload Prediction using CNN and LSTM	126
<i>T. A. Gamage, Indika Perera</i>	
Few-Shot Early Defect Detection in Industrial Manufacturing using Explainable Siamese Networks.....	132
<i>Ravindu Senarathna, Nethmi Wijesinghe</i>	
Classification of Sri Lankan Leafy Tea Grades using Deep Learning	138
<i>Tharushi P. Amarabandu, Sulochana Rupasinghe</i>	
Investigation of Drying Kinetics of Heat Pump Drying and Post-Drying Quality Parameters of Mango by using Gliding Arc Plasma Discharge (GAPD) Pre-Treatment.....	143
<i>Samodya Hettige, Amanda Kodippili, Gayathri De Silva, Sanja Gunawardena, Neville Amunugoda</i>	
Real-Time Cloud Detection, Tracking, and Trajectory Forecasting using Deep Learning and Sky Imagery.....	149
<i>W. S. Kaveesha, K. S. Samarakoon, W. C. Nirmal, D. S. Ramanayaka</i>	
Experimental Investigation and CFD Modelling for Enhancing Pipeline Performance for High Concentration Fly Ash Slurry	155
<i>Thusira Kalupathirana, Stuti Mishra, Deo R. Kaushal</i>	
Precise MRI Slice Extraction Along the Anterior Commissure-Posterior Commissure (AC-PC) Axis: A Standardized Approach.....	161
<i>Gihan Rangana, Tharindu Samaranayake, Nisala Jayathilaka, Uditha Wijewardhana, Senal Fernando, Umayal Balagalla</i>	
A Sector-Specific Supplier Selection Framework for Airport City Development	167
<i>Jayawardhana Pranama, Fernando Anuja</i>	
Room Temperature Chlorine Gas Sensor Based on Alpha-Titanium Phosphate Synthesized from Ilmenite Beach Sand.....	173
<i>Chandima Ruwanthilaka, Lalinda Palliyaguru, Pradeep Jayaweera</i>	
An AI-Driven Smart Mirror Application for Social Event-Based Fashion Recommendation and Facial Skin Health Analysis.....	179
<i>Navodya Rathnasekara, Nisala Damith, Dasuni Herath, Sanuri H. Liyanaarachchi, Ovini V. Seneviratne, Udaya Wijenayake</i>	

Detection of Multiple Structural Damage Through Modal Analysis: An Experimental and FE Approach	185
<i>C. M. Rathnayake, H. D. Hidallana-Gamage, C. S. Lewangamage</i>	
A Hybrid VLC/RF Indoor Localization with Supervised Learning	191
<i>M. W. P. Maduranga, Poompat Saengudomlert, Vindula L. Jayaweera, Nishan Dharmaweera</i>	
Optimisation of Washing Cycles to Enhance Pre-Processing of Coal Fly Ash as a Precursor for Wastewater Treatment using Response Surface Methodology	197
<i>Ransika Y. Galappaththi, Pasindu Arunapriya, Dulmini Hissalle, Sandaru Chamith, Chulantha Jayawardena, Ashane Fernando, Maheshwari G. Wickrama</i>	
Segment-Driven Corporate Report Summarization using Positional-Aware Clustering and Hybrid Summarization	203
<i>C. D. R. M. Weerasinghe, M. R. A. A. K. Gunasinghe, H. B. K. S. Siriwardana, Indika Perera</i>	
Reconfigurable Hardware Design of NTT-Based Polynomial Multiplication Accelerator for Post Quantum Cryptography	209
<i>Chathura Gunasekara, Chandana Gamage</i>	
A Unified Deep Learning Approach for the Segmentation of Breast Masses and Calcifications	215
<i>Tirush Wickramasingha, Janindu Athukorala, Didulangani Deepashika, Senal Fernando, Uditha Wijewardhana, Umayal Balagalla</i>	
Graphene Oxide Incorporated Silica Nanocomposite: Facile Low-Cost Synthesis for Application in Concrete and Cement Mortar Mixtures	221
<i>A. R. M. A. M. Rathnayake, V. G. C. Samanmali, Nishan Dharmaweera, Thilaksiri Bandara, Rangika De Silva, H. C. S. Perera, M. M. M. G. P. G. Mantilaka</i>	
A Comparative Analysis of OpenStack Autoscaling Engines: Evaluating Performance, Scalability, and Usability of Heat and Senlin Under Real-World Workload Patterns	227
<i>Adeesha Wijayasiri, Dinith Liyanage</i>	
AI Chatbots for Humanized Service Touch and Customer Satisfaction Towards Promoting AI-Enabled Banking Interactions	233
<i>A. H. T. J. Sisirika Wikeshani, R. P. A. Indeewari Jayamanna, W. D. H. B. Udayakumara Wanasinghe, H. A. D. Maduranga Arachchi, G. D. Samarasinghe, H. Tharushki Sisara</i>	
Predictive Analytics for Tea Leaf Aging and Quality Degradation	239
<i>Ravindu J. Bandara, Anushka Kuruppu</i>	
ARGO-SLSA: Software Supply Chain Security in Argo Workflows	245
<i>Thariq Mohamed, Indrajith Ekanayake</i>	
Exploring the Application of Modular Product Development in Achieving Multiple Styling Options in Women's Pants	251
<i>Githmi Samarasekara, Niromi Seram, Rivini Mataraarachchi</i>	
Brachiation Robot Inspired by Gibbon Dynamics: Insights for Control Across Irregular Bar Spacing and Heights	257
<i>K. D. S. H. M. Perera, Y. W. R. Amarasinghe, W. A. D. M. Jayathilaka, Eranga De Silva</i>	
Learning-Based Optimal ADC Bit Allocation in Quantized MIMO Systems	263
<i>Chanula Luckshan, Thilanka Gnanasena, Samiru Gayan, Hazer Inaltekin</i>	

Fabrication of Microcapsules with n-Octadecane Core and Melamine-Formaldehyde Shell for Enhanced Thermoregulation in Textiles	269
<i>Kulith T. Ranasinghe, Tharindu V. Gunarathna, Dilshan K. Shashimal, Gayani K. Nandasiri, Indrajith D. Nissanka</i>	
Unified Deep Convolutional Network for Robust and Highly Generalized Speaker Clustering.....	275
<i>Ketharan Suntharam, Sarangan Janakan, Uthayasanker Thayasivam</i>	
Assessing Compound Hydrometeorological Extremes and Their Transformative Impacts on Streamflow in a Changing Climate	280
<i>Dasunmi N. Kumarasiri, Luminda Gunawardhana</i>	
A Data-Driven Queueing Approach for Capacity Planning of a Burn Center	286
<i>Nisal Warnakulasooriya, Chanaka Senanayake, Aravindy T. Weerasekera, Bryan Norman</i>	
Influences on Undergraduate Enrollment and Career Perceptions: Study of Sri Lanka's Maritime Logistics Sector	292
<i>Dulaksha Pethawadu, Indika Sigera</i>	
Machine Learning-Driven Discovery of Photocatalysts for Solar Hydrogen Production: Overcoming Bandgap Prediction Challenges with Transfer Learning	298
<i>Sithira Liyanage, Anuradha Irugalbandara, Dilantha Thushara, Hiran Chathuranga, Indika Perera, Susiri Costa</i>	
Enhancing Video Generation Based on Text-to-Image Diffusion Models using a Multimodal Approach	304
<i>K. D. Sanjula Appuhamy, Udaya S. K. P. M. Thanthrige</i>	
An Integrated Sound-Based Traffic Control System (Green Light) for Ambulance Prioritization at Urban Intersections.....	310
<i>Pipuni Wijesiri, Sanath Jayasena</i>	
Exploring the Potential of Textile Industry Combustion Residues as Sustainable Adsorbents: A Study on Thermal Treatment -Induced Stabilization and Methylene Blue Removal Efficiency	316
<i>Timeshi Herath, Hashini Nayanathara, Chanaka Udayanga, Shakila Pathirana, Jagath Manathunga</i>	
Redesigning Supply Chains for Industry 5.0 in Developing Economies: A Research Agenda.....	322
<i>Amila Bandara, Amila Thibbotuwawa, H. Niles Perera</i>	
Engagement in Professional Tasks with Generative AI Versus Cognitive Skills: A Case of IT Industry in Sri Lanka	328
<i>Sandani Ranatunga, Ravindi Jayasundara, Bimali Jayasinghe</i>	
A Smart Load Shedding System for Appliances to Improve Power System Stability in Smaller Isolated Grids	334
<i>Sahan Gunathilaka, Yasith Rajapaksha, Navindu Akalpa, Thushara Damayanthi, Tilak Siyambalapitiya</i>	
Enhancing Subgrade Strength of Rural Roads Constructed on Soft Soils using Varied Grades of Coir Fiber	340
<i>Upeksha U. Dona, Chamod Hettiarachchi</i>	
Study on Methods of Testing Tensile Strength of Concrete	346
<i>Z. R. Dole, K. Baskaran</i>	

MEMS-Based Capacitive Strain Sensor for Cervical Spinal Fusion Monitoring- Design and Optimization Approach	352
<i>M. A. Y. Perera, Y. W. R. Amarasinghe, W. A. D. M. Jayathilaka</i>	
Developing a Framework for Certification of ISO 9001 for the Electrical Equipment Manufacturing Industry in Sri Lanka	358
<i>K. H. R. Sajeewani, J. R. Gamage</i>	
Extraction and Characterization of Sri Lankan Water Hyacinth Fibers	364
<i>U. K. O. I. Rathnapriya, E. A. T. Silva, U. S. W. Gunasekara</i>	
Modeling Elephant Migration and Deforestation Hotspots in Sri Lanka's Dry Forests using Hybrid CNN-LSTM Architectures and Cellular Automata	370
<i>Thanabalasingam Keerthanaram, Sangeetha Mahendran</i>	
Kinetic Analysis of Dairy Sludge Pyrolysis using the Coats-Redfern Method	375
<i>Shakya Abeysinghe, Dasith Wijesekara, Prasad Amarasinghe, Kitae Baek, Mahinsasa Narayana</i>	
Dynamic Modeling and Simulation of the Effect of Multiple Inhibition in Anaerobic Digestion of Fish Waste	380
<i>J. Suvethiga, R. Ramprasath, P. G. Rathnasiri</i>	
A Demand-Responsive Tariff Algorithm for Islanded Microgrid Electricity Markets in Sri Lanka.....	386
<i>D. M. B. S. Dissanayake, S. A. V. Rahal, K. G. D. S. Samaraweera, P. G. S. N. Kapilarathne, W. H. Eranga, K. T. M. U. Hemapala</i>	
Effect of Coir Husk Fiber on Rice Husk Ash and Cement Based Peat Stabilization.....	392
<i>Yasanthi Jayapathma, Sampath Hewage</i>	
Enhancing Combustion Performance in KNSU Solid Rocket Propellants: Experimental Study of Coconut Shell Charcoal as a Sustainable Additive.....	398
<i>S. A. Mawathage, U. W. M. D. Dissayanake, Y. Ketheeswaran, J. G. A. S. Jayasekara</i>	
Do Older Vehicles Pollute More? Insights from Emissions Testing Data in Sri Lanka.....	404
<i>Nimali M. S. Dewage, Manoj Ranaweera, Thusitha Sugathapala, Ravindi Jayasundara</i>	
A Binary Classification Model for Autofocus Determination in Microscopic Blood Smear Images	408
<i>D. C. Hewavitharana, V. P. C. Dassanayake, W. A. D. M. Jayathilaka, Y. W. R. Amarasinghe</i>	
Sheath-Free E-Yarns Through Yarn Covering for Enhanced Knittability.....	414
<i>Ashmika S. Gamage, Nipun S. Viduranga, Sharika S. Gunawardhana, Mohammad Aslam, Chamika Madhurangi, Sanath Jayawardena</i>	
Design of Glass Fiber Reinforced Composite Blades for a 1 kW Small-Scale Wind Turbine	420
<i>A. W. G. T. N. Thilakarathna, I. D. D. P. Rashmina, H. S. S. M. Hewawasam, K. K. M. N. P. Samaraweera, P. B. Henadeera, M. Hordagoda</i>	
Context Aware Trilingual Conversational Service Robot for Restaurant	426
<i>Ketharani Pirabakaran, Athyraian Ragunathan, Lingeswaran Sathiyalokeswaran, A. G. B. P. Jayasekara, Jayathas Vadivelthasan</i>	
Strategic Decision Framework for Sustainable Retrofitting: Decarbonizing Small and Medium-Sized Hotels in Tropical Monsoon Climates	432
<i>Upeksha V. Karunathilake, Hirushie Karunathilake, Indrajith D. Nissanka</i>	

Delphi-Driven Insights into Artificial Intelligence Implementation in Sustainable Supply Chains: Navigating Barriers and Strategic Enablers.....	438
<i>Amshana Sathiyaseelan, Biman D. Hettiarachchi</i>	
Performance Evaluation of Aspha-Min Modified Warm Mix Asphalt	444
<i>Sandali Dilsara, Chamod Hettiarachchi</i>	
Preparation of High-Capacitance Nitrogen-Doped Graphene Oxide from Graphene Derived from Sri Lankan Vein Graphite	450
<i>Lasini Abeywickrama, Manul T. Karunasiri, H. S. Sithanamaluwa</i>	
A Clinically Interpretable Rule-Based Algorithm for Detection of Premature Ventricular Contractions.....	456
<i>Pahansith Tharuka</i>	
Barriers Influencing Application of Supply Chain Research in Practice: A Practitioners' Viewpoint Through a Fuzzy Delphi-AHP Approach	462
<i>Ruwanga N. Dayawansa, Jayani I. Sudusinghe, Nimantha T. Thalagala</i>	
Deep Learning-Based Coral Reef Segmentation: A Satellite Imagery Study of the Trincomalee District.....	468
<i>Nirupa Ariyaratthinam, Logiraj Kumaralingam, Bramya Sinthathurai, Keerthanaram Thanabalasingam, Jeyamugan Thirunavukkarasu, Nagulan Ratnarajah</i>	
Blockchain for Information Sharing in Supply Chains: A Delphi Study	474
<i>Kamal Hettige, Biman D. Hettiarachchi</i>	
Performance of Multi-Stage Triaxial Tests on Rock Deformation	480
<i>Anjula Dassanayake, Yoshiaki Fujii, Amasha Silva</i>	
Investigate the Effect of Crosslinking Agents and Binders on the Binding Ability of Sandalwood Essential Oil with β -Cyclodextrin for the Retention of Fragrance on Cotton Fabric	486
<i>Manushika K. Deneththi, Dinithi P. Liyanage, Isuri T. Jayaweera, Ujithe Gunasekera, Tharindu Senapathi, Gayani K. Nandasiri</i>	
Design and Manufacturing Optimization of a Highspeed PCV Centrifuge Machine	491
<i>M. A. Y. Perera, K. D. C. S. Kalubowila, K. A. K. Gayan, Y. W. R. Amarasinghe, L. A. D. M. Jayathilaka</i>	
Investigation on Nano-Structural Color for Fabric Printing using Silica Nanoparticles	497
<i>Sapni T. Chandrasekara, Dakshika Jayamindi, Dasuni K. Maddumage, Irushika M. Lakshani, Chathuranga Senarathna, Gayani K. Nandasiri</i>	
Comparative Study of Theoretical and Numerical Analysis to Evaluate the Aerodynamic Performance of a Helical Vertical Axis Wind Turbine.....	503
<i>H. R. S. Udani, A. W. L. D. Abeyweera, H. M. S. G. Herath, Indrajith D. Nissanka, Nalaka Samaraweera</i>	
A Machine Learning Approach for Generating the Crotch Curve in Customised Trouser Patterns	509
<i>N. G. Chathumi K. Gamage, K. M. G. C. Abewardhana, R. A. Kavindu Lakdilina, R. K. J. De Silva</i>	
Monolithic TPU Flexure Joints for Confined-Space Tendon-Driven Robotic Arms	515
<i>Asitha L. Kulasekera, Rancimal B. Arumathanthri, Nirosh D. Jayaweera, Thisara Diddeniya, Tharusha Devin, Sachin Abeysinghe</i>	

Exploring the Suitability of Fly Ash and Rice Husk Ash in One-Part Geopolymer: A Case Study for Sustainable, Low-Carbon Construction.....	521
<i>Isuru Batuwita, K. H. S. M. Sampath, A. S. Ranathunga</i>	
Transfer Learning-Based Approach for Improving Cinnamon Diseases and Pests Management	527
<i>M. M. V. Senanayake</i>	
A Fuzzy-Adaptive Sliding Mode Control Strategy for Optimizing Control of Underwater Drone.....	533
<i>K. D. S. H. M. Perera, M. D. A. Thushan, H. D. Ekanayake, Y. W. R. Amarasinghe, W. A. D. M. Jayathilaka</i>	
Analysis of Bending Stiffness Reduction in Thin Woven Composites Under Large Curvatures	539
<i>Pamith M. Ranatunga, Lasantha Weerasekara, Tharuka Gayashan, Chinthaka Mallikarachchi</i>	
Design and Simulation of a Monolithic MEMS Platform for Single-Cell Injection with Integrated Gripping and Force Feedback.....	545
<i>D. M. S. D. Dasanayaka, Y. W. R. Amarasinghe, W. A. D. M. Jayathilaka</i>	
Machine Learning & IoT Based Water Distribution System for Reservoirs in Sri Lanka.....	551
<i>Geeth Karunarathne, Udaya S. K. P. M. Thantrige</i>	
EdgeCare: Privacy-Preserving Medical Advising System on Mobile Devices	557
<i>Thejan Weerasekara, Chinthani Chandeepe, Oshan Amarasooriya, Chathuranga Hettiarachchi</i>	
PoseView3D: Dynamic Multi-View Angular Encoding for Skeleton-Based Action Recognition.....	563
<i>Avishka Ranasinghe, Akila Karunanayake, Uthpala Ratnayake, Viraj Ariyawangsha, Roshan Godaliyadda, Parakrama Ekanayake, Vijitha Herath</i>	
Weighted Multi-Model Ensemble Approach for Robust Monsoon River Flow Projections	569
<i>Wenusha Senarathna, Luminda Gunawardhana</i>	
Evaluating Corrosion Propagation in Steel with Damaged Protective Coating.....	575
<i>G. N. C. Leelarathna, H. M. S. T. Herath, K. Baskaran</i>	
Development of Marine Grade Acrylonitrile – Butadiene – Styrene (ABS) Based Hull of an Underwater Drone	581
<i>Himasha Ekanayake, Athishka Thushan, Madusanka Perera, Ranjith Amarasinghe, Dumith Jayathilaka</i>	
Lifelike Virtual Reality Experiences using Shape Adaptive Haptic Gloves with Digital Twin	587
<i>S. D. Dayaratne, A. S. Hettiarachchi, C. N. Perera, H. M. K. K. M. B. Herath, S. L. P. Yasakethu, B. G. D. A. Madhusanka</i>	
Evaluating the Quality of Traditionally Peeled vs. Machine Peeled Cinnamon.....	593
<i>Ayodhya D. Alahakoonge, Hasith Gunasekara, Shantha Amarasinghe, Janaka Gamage</i>	
Classification of Same Limb Motor Imagery EEG using Temporal Attention Based Hierarchical Transformer	599
<i>Minindu Liyanage, Pasan Gunasekara, Ramith Laksara, Ruwan Ranaweera, Janaka Wijayakulasooriya, Nalin Harischandra, Tharaka Dassanayake</i>	
Sinhala Language Specific Vocal Biomarker Extraction for Parkinson's Diagnosis using Machine Learning	605
<i>P. S. Rathnayake, L. C. D. Lokuhennadige, S. M. U. S. Samarakoon, H. M. K. K. M. B. Herath, B. G. D. A. Madhusanka, S. L. P. Yasakethu</i>	

GO-PES Membrane for Industrial Dye Effluent Water Purification	611
<i>Sandaruwan Athapaththu, Nuwanga Gamage, Hansinee Sitinamaluwa</i>	
SinLlama - A Large Language Model for Sinhala	617
<i>H. W. K. Aravinda, Rashad Sirajudeen, Samith Karunathilake, Nisansa De Silva, Rishemjit Kaur, Surangika Ranathunga</i>	
Vision-Driven Diagnostic Intelligence Through Deep Learning for Retinal Health Analytics	623
<i>H. M. K. Mihijaya, A. S. D. Karunaratna, S. M. U. S. Samarakoon, M. G. S. N. Sankalana, H. M. K. K. M. B. Herath, S. L. P. Yasakethu</i>	
Unveiling Misalignment Fault Severities: A Novel SCD-CNN Framework for Rotating Machinery	629
<i>Dilshara Herath, Chinthaka Abeyrathne, Chamindu Adithya, Chathura Seneviratne</i>	
Implementing an Automatic Temperature Controller Based on Real-Time Fabric Classification for a Smart Ironing Appliance.....	635
<i>T. I. Hettiarachchi, R. M. Maheshi Ruwanthika, K. L. M. Perera</i>	
Utilizing Multilingual Encoders to Improve Large Language Models for Low-Resource Languages.....	641
<i>Imalsha Puranagedara, Themira Chathumina, Nisal Ranathunga, Nisansa De Silva, Surangika Ranathunga, Moganarangan Thayaparan</i>	
Optimizing Delivery Logistics: A Comparative Study of Clustering Algorithms for Zoning Restaurant Orders	647
<i>Upeksha Senanayake, Amila Thibbotuwawa</i>	
Development of an Optical Particle Counter.....	653
<i>A. Akimsan, D. A. S. Amarasinghe, D. Attygalle, V. S. C. Weragoda, A. M. P. B. Samarasekara</i>	
Advancing Retrieval-Augmented Generation for Financial Question Answering.....	658
<i>Akmal A. Jasmin, Indika Perera, Muaadh Mohamed, Mohamed Mushraf</i>	
Assessing the Impact of Tree Canopy on Interception Loss in a Small Catchment.....	664
<i>Nuwan Tharanga, Nilupul Gunasekara, Nimal Wijayarathna</i>	
Enhancing Traffic Signal Systems in Sri Lanka using Artificial Intelligence.....	669
<i>Harshana Wijesekara, Chaminda Pushpakumara</i>	
Design and Simulation of a Paraffin-Based Solar Thermal Energy Storage System for Enhanced Indoor Thermal Comfort	675
<i>J. R. W. Dahanayake, L. K. K. Weerasinghe, D. Attygalle, D. A. S. Amarasinghe, A. M. P. B. Samarasekara, V. S. C. Weeragoda</i>	
Monolithic 3D-Printed Three-Chamber Pneumatic Soft Gripper for Delicate Bra Cup Manipulation	681
<i>Hewage M. D. L. Dabare, Asitha L. Kulasekera, J. R. Gamage</i>	
Design and Development of a Regenerative Suspension System for Electric Vehicles	687
<i>Kalhara Bandaranayake, Kaveen Ranwatta, Udara Senadhipathi, Dilshan S. P. A. Baragamage, Lihil U. Subasinghe</i>	
Development of Sustainable Cement-Based Material for Additive Manufacturing	693
<i>V. K. K. Pathirage, P. G. T. Perera, G. I. P. De Silva, P. W. R. M. Dilhara</i>	
A Comparative Analysis of Similarity-Based Retrieval for SVG Logos.....	699
<i>Hirushi Premarathna, Ravini Kuruppu, Maneesha Thotagammana, Gihan Dias</i>	

Evaluating Pedestrian Behaviors and Safety Risks at Unsignalized Mid-Block Crossings in Colombo	705
<i>Thanoja Yokarasa, Thillaiamapalam Sivakumar</i>	
Diabetes Mellitus Early Detection using Deep Learning on Fingernail Images.....	711
<i>S. M. V. M. Senanayake, K. G. Samarawickrama</i>	
Electrospun PVA Nanofibers Reinforced with Cotton-Derived Cellulose Nanocrystals: A Sustainable Route to High-Performance Nanocomposites	717
<i>J. P. N. Dedunu, P. W. G. S. U. Wijerathna, A. M. P. B. Samarasekara, D. A. S. Amarasinghe, V. S. C. Weragoda, D. Attygalle</i>	
Artificial Intelligence Techniques in Basin Hydrology and Material Flow Analysis and Their Applicability to Sri Lankan River Basins	722
<i>K. H. Thushan Chamika, R. L. H. L. Rajapakse</i>	
Investigation of Activated Carbon-Modified Bitumen using Coconut Charcoal	728
<i>Jayani Wickramasinghe, Chamod Hettiarachchi, Wasantha Mampearachchi</i>	
Parametric Optimisation of Two-Way Slabs on Beams for Early-Stage Low-Carbon Design	734
<i>Nithuran Jeyamahendran, Amila Jayasinghe, Pasindu Weerasinghe</i>	
Distillation-Boosted Spiking Neural Network for Gesture Recognition	740
<i>G. M. M. K. Aponso, J. Thusyanthan, W. I. U. D. Wellahewa, C. Hettiarachchi</i>	
Conversation Prediction for Vishing Attack Detection: A Comparative Analysis of Pre-Trained Transformer Models	746
<i>Sanuja Edirisinghe, Ashan Subodha, Chandana Gamage</i>	
Modelling and Parameter Tuning of the Governor System at Lakvijaya Power Station for Turbine Load Control Mode of Operation for Enhanced Stability	752
<i>Mohamed Shakir, Udith Harshajith, Sathya Punchibandara, Mandini Nilhara, Supun Fernando, Anuruddha Madawala, J. P. Karunadasa</i>	
Siamese Networks for Multilingual Classified Ad Matching	758
<i>Pamudu Chathunka, Damika Alwis, Rasindu Rawishanka, Indika Perera</i>	
Strategic Significance of Establishing a Sri Lankan Ocean Test Centre for Advancing Marine Energy Innovations.....	764
<i>H. D. A. Dilrukshi, R. L. K. Lokuliyana, K. A. C. Udayakumar</i>	
Hot Spot Temperature Modeling in Power Transformers using Variation in Load and Ambient Temperature.....	770
<i>Thilini L. Gamage, Ravindu Kariyawasam, Saanron Ravichchanthiran, Prathap Wijesuriya, Rasara Samarasinghe</i>	
Optimizing Flood Risk Management Through Nature-Based Solutions (NBS): A Case Study in the Attanagalu Oya Basin, Sri Lanka	776
<i>Oshara Sandamini, Lalith Rajapakse</i>	
Development of a Dexterous Manipulator for Underwater Cleaning	782
<i>G. H. V. D. Chinthaka, V. O. Kodagoda, P. H. A. S. De Silva, R. K. P. S. Ranaweera, V. P. C. Dassanayake</i>	

Tailoring ZnO Nanostructure for Enhanced Capacitive UV Response.....	788
<i>Y. De Zoysa, Dinura Saminda, Chamod Thalayarathna, Chethana Senevirathna, Janith Mahanthe, Imalka Munaweera, Shantha Amarasinghe, Dinesh Attygalle, V. S. C. Weragoda, A. M. P. B. Samarasekara, Laleen Karunanayake</i>	
A Theoretical Model for Thrombin Generation Kinetics in the Initial Phase of the Extrinsic Pathway of Human Blood Coagulation	794
<i>Isurika U. Weerasinghe, S. Amarasinghe, Dinesh Attygalle, Bandu Samarasekara, Sampath C. Weragoda</i>	
Design-Aware Optimization of 2D Skeletal Structures using Conditional Generative Adversarial Networks (cGANs).....	800
<i>Chamod Fernando, Sumudu Herath</i>	
Eco-Friendly Approach to Cellulose Recovery: Extraction and Characterization from <i>Salvinia Molesta</i>	806
<i>Ashani Abeyweera, Bandu Samarasekara, Sampath Weragoda, S. Amarasinghe, Dinesh Attygalle</i>	
Intent Classification for Automated Software Deployment Plan Generation: A Transformer-Based Approach	812
<i>S. P. Wijesinghe, K. R. Gimhan, M. A. T. Sahassaka, Indika Perera</i>	
Advancing UAV Implementation for Medical Supply Distribution: A Systematic Review of Current Practices and Future Directions	818
<i>Dhanusha S. Hewage, W. Madushan Fernando, Amila Thibbotuwawa</i>	
Assessing the Performance of HEC-HMS Model vs. Machine Learning Algorithms in Predicting River Discharge	824
<i>Umal Manjitha, Chamal Perera</i>	
Investigating Land Cover Effects on Tsunami Overland Flow Dynamics using HEC-RAS Model.....	830
<i>Harith Jayasooriya, Chamal Perera</i>	
Tribological Behavior of Natural Rubber: A Multivariate Analysis using Friction and Mechanical Properties.....	836
<i>B. M. K. A. Gunasekara, V. S. C. Weragoda, A. M. P. B. Samarasekara, D. A. S. Amarasinghe, D. Attygalle</i>	
A Numerical Investigation of the Sensitivity of the Oil Weathering Process to Ambient Conditions in Accidental Ocean Oil Spills.....	840
<i>Lalani Kaluarachchi, Ajith De Alwis, Indrajith D. Nissanka</i>	
Leveraging Vehicular Test Databases to Develop a National Emissions Prediction Model: A Case Study for Sri Lanka	846
<i>Sankha Jayawardhana, Saman Bandara, Varuna Adikariwattage, Thusitha Sugathapala</i>	
IYAL: Input Text Normalizer for Tamil Language	852
<i>Sanujen Premkumar, Nisanthan Sivarasa, Sathveegan Yogendrarajah, Gihan Dias, Kengatharaiyer Sarveswaran</i>	
Electrochemically Exfoliated Nanostructured-Graphite Nanofluids for Heat Transfer Applications.....	858
<i>Charuka Abeysinghe, Nadun Thathsara, Hansinee Sitinamaluwa</i>	
Modelling and Simulation of a Vertically Integrated Piezoelectric Nanogenerator Designed with Nanowire Arrays in Vibration Mode	864
<i>Chamodya L. Rathnayaka, Thilanka B. Dissanayake, Sudarman U. Adikary</i>	

Robustness-Based Optimization Model for Post-Flood Road Network Recovery	870
<i>Methmini Kulathunga, H. R. Pasindu</i>	

NOx Emission Estimation and Prediction for Newly Registered Motor Cars using Type Approval Data and Machine Learning Techniques	876
<i>Malimage K. D. Aponsu, Varuna Adikariwattage, Saman Bandara, Thusitha Sugathapala</i>	

Author Index