



ADScAI

Applied Data Science & Artificial Intelligence Symposium

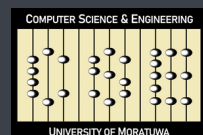
PROCEEDINGS OF

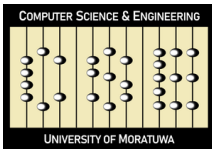
Applied Data Science & Artificial Intelligence Symposium 2025

ORGANIZED BY

THE DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING,
UNIVERSITY OF MORATUWA

COMMEMORATING THE 40TH ANNIVERSARY OF CSE





DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
UNIVERSITY OF MORATUWA



Proceedings of ADScAI Symposium 2025

1st Applied Data Science & Artificial Intelligence Symposium
8th April 2025

Applied Data Science & Artificial Intelligence Symposium (ADScAI)

www.adsc.ai.cse.uom.lk

ADScAI 2025, 8th April 2025

Conference mode: Onsite

Conference organized by: Department of Computer Science & Engineering,
Faculty of Engineering,
University of Moratuwa

ISSN 3121-3103



9 773121 310006

Copyright and reprint permissions:

Copyright@2025 Department of Computer Science & Engineering, Faculty of Engineering, University of Moratuwa, Sri Lanka. All rights reserved according to the Code of Intellectual Property Act of Sri Lanka, 2003. No part of this publication may be reproduced, stored, transmitted, or disseminated in any form or by any means without prior written permission from the ADScAI Symposium.

Disclaimer:

The materials in this publication have been supplied by authors, and the views expressed remain the responsibility of the named authors. The statements and opinions stated in this publication do not necessarily represent the views of the ADScAI Symposium.

Published by:

Department of Computer Science & Engineering,
Faculty of Engineering,
University of Moratuwa,
Katubedda, Moratuwa, 10400, Sri Lanka.

Message from the Dean, Faculty of Engineering

Prof. Jagath Manatunge

Dean

Faculty of Engineering

University of Moratuwa



It is with great pride and enthusiasm that I extend my warmest congratulations to the Department of Computer Science and Engineering as you celebrate your remarkable 40th anniversary by organizing yet another remarkable event: the Applied Data Science & Artificial Intelligence Symposium (ADScAI) 2025.

The rapid advancement of technology, particularly in the fields of data science and artificial intelligence, continues to redefine the boundaries of what is possible, opening new horizons in every sector of engineering and beyond. Our collective journey towards innovation and technological excellence is strongly influenced by the pioneering efforts and intellectual rigor exemplified by our colleagues in Computer Science and Engineering.

This symposium, focused on the cutting-edge disciplines of Applied Data Science and Artificial Intelligence, is not just a celebration of past achievements but a visionary step towards shaping the future. It provides a vital platform for researchers, industry experts, and students to collaborate, innovate, and explore solutions for real-world challenges, reinforcing the commitment of our university to leadership in technological advancement and societal development.

I commend the organizing committee for their dedication and meticulous preparation in curating a symposium that aligns perfectly with contemporary global trends and addresses pivotal challenges facing our societies today. I am confident that the proceedings documented from this event will serve as a rich resource, fostering knowledge exchange and inspiring further innovation in our academic community and beyond.

I wish the Applied Data Science & Artificial Intelligence Symposium 2025 a resounding success and congratulate once again the Department of Computer Science and Engineering and the organizing committee for their continued excellence and impactful contributions to the field.

Message from the General Chair

Dr. T. Uthayasanker

General Chair

Applied Data Science & Artificial
Intelligence Symposium (ADScAI 2025)



It is with great pleasure that I welcome you to the inaugural Applied Data Science & Artificial Intelligence Summit (ADScAI), organized by the Department of Computer Science and Engineering at the University of Moratuwa. This symposium serves as a vibrant forum for researchers, practitioners, and industry leaders to exchange ideas, present novel contributions, and discuss the latest advancements in data science and artificial intelligence.

Sri Lanka is at a pivotal moment in its digital transformation journey, with national initiatives emphasizing AI-driven innovation, data-driven decision-making, and the integration of intelligent systems into key sectors. As the country moves towards adopting AI and data science in governance, education, healthcare, and industry, ADScAI provides a timely opportunity to align academic research with these national priorities. The discussions and collaborations fostered through this symposium will contribute to shaping policies, developing ethical AI frameworks, and accelerating technological adoption in Sri Lanka.

The overwhelming response to the first edition of ADScAI has been truly remarkable, with over 150 article submissions from researchers across diverse domains. With a rigorous review process and a 48% acceptance rate, we have ensured that only high-quality and impactful research is presented, reflecting the depth and breadth of innovation in AI and data science.

By bringing together thought leaders and experts, ADScAI aims to bridge the gap between theoretical advancements and real-world applications. The insights shared here will not only advance AI research but also support Sri Lanka's efforts in building a robust digital economy and a future-ready workforce.

I extend my sincere gratitude to the organizing committee, reviewers, authors, and sponsors who have contributed to making this event possible. Your efforts have helped establish ADScAI as a cornerstone for meaningful discussions and impactful research in AI and data science.

I invite all participants to engage actively, exchange ideas, and explore collaborations that will drive the future of AI in Sri Lanka and beyond. Let us work together to shape an AI-powered future that is ethical, inclusive, and beneficial for all.

Message from the Program Chair

Dr. Thanuja Ambegoda
Program Chair
Applied Data Science & Artificial
Intelligence Symposium (ADScAI 2025)



It is my pleasure to welcome you to the inaugural Applied Data Science & AI Symposium 2025 (ADScAI 2025). This symposium marks the beginning of an exciting journey where researchers, practitioners, and industry leaders come together to explore the transformative impact of data science and artificial intelligence across domains.

In recent years, AI and data-driven technologies have reshaped industries, accelerated scientific discoveries, and influenced decision-making at an unprecedented scale. As we navigate this rapidly evolving field, ADScAI 2025 serves as a platform to share knowledge, present innovative solutions, and foster collaborations that drive real-world impact.

This year's program features a diverse range of research contributions, and thought-provoking discussions. The accepted papers reflect both theoretical advancements and practical applications, highlighting the growing synergy between academia and industry in solving pressing challenges.

I extend my deepest gratitude to the authors, reviewers, and the Organizing Committee for their dedication in making this symposium a success. A special thanks to our reviewers, organizers, volunteers, and sponsors for their invaluable contributions. Your collective efforts have shaped a rich and engaging program.

I invite you to immerse yourself in the discussions, connect with fellow researchers, and take full advantage of the opportunities ADScAI 2025 offers. Let this symposium be the start of meaningful collaborations and groundbreaking innovations in applied data science and AI.

Message from the Publications Chair

Dr. Buddhika Karunaratne
Publications Chair
Applied Data Science & Artificial
Intelligence Symposium (ADScAI 2025)



On behalf of the publications committee, we are delighted to present this collection of extended abstracts from the Applied Data Science and Artificial Intelligence (ADScAI) Symposium by the Department of Computer Science & Engineering (CSE), University of Moratuwa.

The symposium is part of many events in the line up for the 40th Anniversary celebrations of the Dept. of CSE. This proceedings encapsulates the innovative research, insightful analyses, and practical applications shared by the esteemed contributors.

We extend our sincere gratitude to all authors, reviewers, and attendees for their dedication and participation, which have collectively enriched this endeavour. We hope this volume serves as a valuable resource for researchers, practitioners, and enthusiasts alike, fostering further exploration and collaboration in the ever-evolving landscape of Data Science and AI.

ADScAI Organising Committee

Conference Chairs

General Chair

Dr. T. Uthayasanker

Program Chair

Dr. Thanuja Ambegoda

Publications Chair

Dr. Buddhika Karunaratne

Student Co-Chairs

T. J. Sathiyendra

N. Y. D. De Silva

C. Meenambika

C. D. R. M. Weerasinghe

Sub-Committees

Program and Event

T. J. Sathiyendra (Lead)
N. Y. D. De Silva (Lead)
R. Abaiyan
I. A. Ampavila
D. H. Aththanayake
K. G. C. Bandara
D. M. A. K. Dissanayake
E. K. K. D. R. Edirisinghe
H. A. A. S. Gunathilake
G. Janushikha
R. T. U. Jayasena
J. P. T. S. Jayasinghe
J. D. H. Jeewardara
L. A. G. H. Lihinikaduarachchi
C. Meenambika
P. Neelayadhakshi
S. K. S. Syvendra
B. Thilakshan

Delegates & Participant Handling

C. Meenambika (Lead)
A. H. Gallage
T. P. Kannangara
T. K. M. C. Karunaratne
H. A. Kavyanga
S. Y. A. C. Navodi
E. N. K. Wijeratne
M. S. T. Wijesekara
J. M. I. Wijesooriya

Publications and Editorial

C. Meenambika (Lead)
C. D. R. M. Weerasinghe (Lead)
S. N. Gunawardena (Proceedings Editor)
J. Kavienan
R. Birunthaban
V. Vimosh
S. A. Talagala
P. Varun

Logistics

T. J. Sathiyendra (Lead)
R. M. I. B. Rathnayake
R. D. S. S. Jayathunga
R. Abaiyan
K. N. B. Abeysundara
K. G. C. Bandara
A. J. R. J. Charindith
D. M. S. H. Dissanayake
K. A. E. M. Fernando
W.A.I. Garavi
M. I. M. Ifaz
R. T. U. Jayasena
J. A. N. S. Jayasooriya
K. M. N. S. Kariyapperuma
H. A. Kavyanga
H. A. Kuruppu
L. A. G. H. Lihinikaduarachchi
N. Maathavan
H. S. Mallawarachchi
S. Y. A. C. Navodi
D. L. K. Pankaja
O. V. Samaratunge
W. A. A. U. Wickramaarachchi
M. S. T. Wijesekara

Sub-Committees

Marketing

R. M. P. G. C. K. Ratnayake (Lead)
N. Y. D. De Silva
C. D. R. M. Weerasinghe
W. M. I. D. Jayawickrama
J. D. H. Jeewandara
B. Kajaani
N. D. Kasige
K. M. N. S. B. Kulatunga
R. W. S. Lakruwan
M. R. S. Perera
R. S. A. Samarakoon
N. S. Seneviratne
E. N. K. Wijeratne

Finance

T. J. Sathiyendra (Lead)
J. P. T. S. Jayasinghe
H. M. P. M. Keerthichandra

Outreach & Company Coordination

N. Y. D. De Silva (Lead)
E. K. K. D. R. Edirisinghe
D. M. S. H. Dissanayake
D. H. Aththanayake
U. I. Jayasekara
H. S. Mallawarachchi
P. I. Ranasinghe
A. C. H. Rupasinghe

Web

E. I. W. Subasinghe (Lead)
C. D. R. M. Weerasinghe
I. M. D. P. Illangasinghe
K. Liyanage
U. M. Wijesinghe

ADScAI Review Panel

Ms. A. Fernando, Massey University, New Zealand

Dr. B. Karunaratne, University of Moratuwa, Sri Lanka

Dr. I. Hewapathirana, University of Kelaniya, Sri Lanka

Mr. K. Wijegunaratna, Massey University, New Zealand

Dr. N. de Silva, University of Moratuwa, Sri Lanka

Dr. R. Liyanaarachchi, University of Moratuwa, Sri Lanka

Ms. R. Puvanendran, University of Vavuniya, Sri Lanka

Dr. S. Suthaharan, University of Vavuniya, Sri Lanka

Dr. T. Ambegoda, University of Moratuwa, Sri Lanka

Dr. T. Thanthriwatta, University of Moratuwa, Sri Lanka

Table of Contents

Model Shifting Unlearning: A Scalable Approach to Data Removal	15
Storm Track and Intensity Forecasting Using a Hybrid Machine Learning Approach	17
The Impact of AI Technologies On Salary and Industry Demand for Software Engineering Roles in Sri Lanka	19
A Systematic Review on Evaluating Bias and Equity in Large Language Model (LLM) Applications for Patient Communication in Healthcare	21
Internal Risk Rating Model for Finance Institutes Based on Customer Payment Behaviour	23
An Intelligent Browser Extension for Phishing Website Detection Using Machine Learning Models	25
MSFE-GAN: Multi-Scale Feature Extraction Gan for Perceptually Enhanced Low-Light Images	27
Automated Censoring of Cigarettes and Liquor Drinking in Videos Using Deep Learning Techniques	29
A Deep Learning Approach for Detecting and Mitigating Mental Health Conditions Through a User-Centered Interactive Interface	31
The Impact of Data Cleaning and Model Selection for Depression Prediction: A Comparative Study	33
Enhancing Undergraduate Engagement and Motivation Towards Internship Using Machine Learning and Gamification Techniques	35
Data-Driven Depression Prediction: Insights from a Machine Learning Challenge	37
Comparative Analysis of Machine Learning Models for Depression Risk Prediction	39
Explainable Deep Learning for Chronic Kidney Disease Prediction	41

Table of Contents

Developing A Conversational AI-Driven Physics Tutor with Multimodal Capabilities to Foster Critical Thinking Among G.C.E. Advanced Level Students in Sri Lanka	43
"Sawan" Speech to Sign Conversion Avatar for Deaf People	45
Bias Lens: Systemic Bias Detection with Explainable Analysis	47
Data-Driven Analysis and Machine Learning-Based Forecasting for Big Onion Production in Sri Lanka	49
Sri Lankan Leafy Tea Quality Grades Classification Using Deep Learning	51
Smart Mirror Application for Social Event Based Outfit Recommendation and Skin Health Analysis	53
Developing A Question Answering System for the Sri Lankan School Education System	55
Generative AI For Cybersecurity: Crafting Network Intrusion Datasets	57
Real-Time Bus Arrival Time Updating Using Speed Variations	59
Analysis Of Performance, Integration, And Scalability Limitations of Data Virtualization Layers for Big Data Processing in Emerging Use Cases	61
Self-Optimizing RAG System for AI-Powered Learning	63
Identifying Factors Affecting User Satisfaction in Sri Lankan E-Commerce Websites	65
Integrative Multi-Omics and Clinical Data with Explainable AI: A Deep Learning Framework for Enhanced Early Detection of Polycystic Ovary Syndrome(PCOS)	67
2Dstat: A Machine Learning-Based System for Predicting Consumer Sentiment and Behaviour in Supermarkets	69
CatBoost And Random Forest Algorithms in Binary Classification Tasks	71

Table of Contents

Explainable AI for Speech Emotion Recognition	73
Deep Ensemble and Uncertainty Estimation for More Accurate Protein Localization in DeepLoc2.0	75
VUEBLOX: A Semi-Supervised Hybrid Deep Learning Framework for Occlusion-Aware and Interpretable Crowd Anomaly Detection	77
Autonomous Collision-Free Navigation of UAV in Unknown Tunnel-Like Environments	79
Enhancing Bus Arrival Time Predictions in Transit Networks Through Spatio-temporal Forecasting	81
Cross-Domain Bimodal SER for Customer Service and Tv Show Domains	83
Intelligent Tourism Itinerary Generation Through Natural Language Processing and Hybrid Recommendation Systems	85
SVM-Based Signal Detection for Low-Resolution Quantized Systems	87
Multimodal Search Exploration for E-Commerce	89
Curriculum Model for Artificial Intelligence in Early Childhood Education in Sri Lankan Preschools	91
The Impact of Beamforming In ISAC: A Deep Learning Approach	93
Enhancing Thirukkural Couplet Section Classification: A Meta-Model Learning Approach	95
Predicting Depression Using Traditional Machine Learning Models	97
Commonsense-Driven Symbolic ReAct-NLI Prompting (CSR-NLI) for Causal Analysis of Mental Health Issues in Workspace Communication; Advancements in the CAMS Dataset	99

Table of Contents

A Deep Learning Approach for Host Depletion in Metagenomic Samples	101
Crowdsourcing In Federated Learning: A Scalable Approach to Collaborative Model Training	103
Online Book Recommendation System	105
ATradGPT : Leveraging Agentic AI to Enhance Stock Trading Education and Accessibility in Capital Markets	107
Analyzing Final Grade Anomalies in Academic Performance Data	109
BERT Unleashed: A Robust Bidirectional Shield Against Proliferating Fake News	111
Fetal Health Prediction Using Machine Learning	113
A Data-Driven Spatiotemporal Framework for Retail Analytics	115
NeuroFit: Enhancing Fashion Recommendations Through Multi-Modal Graph Neural Networks with Cold-Start User Handling	117
Context-Aware Code Review: Integrating Generative AI for Automated Pull Request Analysis	119
GymPro: A Pose-Based Gym Workout Analysis and Feedback System	121
End-To-End Smart Agriculture Sensor Network & Analytics Platform	123
Quantum Deep Learning for Encrypted Malicious Traffic Detection A Hybrid Approach for Secure Network Analysis	125
Adapter-Based Fine-Tuning for PRIMERA	127