Sandareka Wickramanayake

Email	sandarekaw@cse.mrt.ac.lk
LinkedIn	http://lk.linkedin.com/in/sandarekawickramanayake
Website	http://sandareka.github.io/
Twitter	https://twitter.com/wsanda89

EDUCATIONAL QUALIFICATIONS

Doctor of Philosophy — **2022**
School of Computing, National University of Singapore

Bachelor of the Science of Engineering (Hons) — **2014**
Department of Computer Science and Engineering
University of Moratuwa

PROFESSIONAL EXPERIENCE

Academic Positions

Senior Lecturer – University of Moratuwa	Feb 2022 – Present
Lecturer (Probationary) – University of Moratuwa	Feb 2016 – Feb 2022
Course Coordinator – Centre for Open and Distance Learning (CODL) - University of Moratuwa	Jan 2022 - Present
Graduate Teaching Assistant – National University of Singapore	Aug 2017 – Aug 2020
Junior Consultant – University of Moratuwa	July 2015 – Feb 2016
Student Instructor - University of Moratuwa	Jun 2013 – Oct 2013

Visiting Positions

Lecturer (Visiting) – Faculty of Business, University of Moratuwa	Sep 2022 – Dec 2022
Lecturer (Visiting) – University of Vocational Technology	Oct 2015 – Dec 2016

Industry Positions

Consultant – Digital Mobility Solutions (Pvt) Ltd	Oct 2022 – Sep 2023
Software Engineer - Mubasher Technologies (Pvt) Ltd	Mar 2014 – July 2015
Trainee Software Engineer - IronOne Technologies (Pvt) Ltd	May 2012 – Dec 2012

Awarded of Excellence for outstanding performance

CERTIFICATIONS

Certificate in Teaching in Higher Education (CTHE) — 2022
Staff Development Center, University of Sri Jayewardenepura

Responsible Conduct of Research — 2020
Collaborative Institutional Training Initiative

CURRENT RESEARCH INTERESTS

- Explainable Artificial Intelligence
- Deep Learning and Deep Learning Applications

Grants

UOM SRC Grant - SRC/ST/2024/41 Rs. 600,000/= Oct 2024 – Feb 2025
PI – Sandareka Wickramanayake
Explainable artificial intelligence for building trustworthy abstractive summarization models.

This University of Moratuwa Senate Research Committee (Short-term) grant supports developing a novel explainable AI (XAI) framework to explain the fact selection process of state-of-the-art abstractive summarization (AS) models. The framework will be integrated into a user-friendly web tool that helps users understand what information is included or omitted in a summary and why, with evaluations conducted in mission-critical domains such as healthcare.

UOM SRC Grant - SRC/LT/2024/10 Rs. 1,500,000/= Nov 2024 – Nov 2025
PI – Sandareka Wickramanayake
Rationalized Artificial Intelligent Decisions through Human-Understandable Explanations for Trustworthy Internet of Things

This University of Moratuwa Senate Research Committee (Long-term) grant supports enhancing user trust in AI-driven IoT applications by investigating human perceptions of AI and Explainable AI (XAI), designing a trust-aware IoT architecture, and developing techniques to generate and evaluate human-understandable linguistic explanations. A key focus is on creating an XAI method that provides natural language rationales for decisions made by a multi-modal human activity recognition system.

PUBLICATIONS

Book Chapters

- PH Panawenna, K G Heththihewa, **S. Wickramanayake,** D. Meedeniya, *"Explainable AI for Building Trustworthy Transformer-Based Abstractive Summarization Models"* in Explainable Artificial Intelligence for Trustworthy Decisions in Smart Applications, Springer Nature, 2025.

- **S. Wickramanayake,** S. Rasnayaka, M. Gamage, D. Meedeniya, I. Perera, *"Explainable Artificial Intelligence for Enhanced Living Environments: A Study on User Perspective"* in Internet of Things: Architectures for Enhanced Living Environments, Advances in Computers, 2024.

Journal Papers

- M Gunathilaka, **S Wickramanayake**, HD Bandara, *"DeFiTrust: A transformer-based framework for scam DeFi token detection using event logs and sentiment analysis"*. Expert Systems with Applications. 2024.

- KN Nguyen KN, S Rasnayaka, **S Wickramanayake**, D Meedeniya, S Saha, T Sim, *"Spatio-temporal dual-attention transformer for time-series behavioral biometrics"*. IEEE Transactions on Biometrics, Behavior, and Identity Science. 2024.

Conference Papers

- M Chandirakumar, T Kanagarajah, N Kalanantharasan, **S. Wickramanayake,** D Meedeniya, *"Human Activity Recognition Using Spatio-Temporal Dual Attention with Cross-Sensor Attention"*. In 2021 International Joint Conference on Neural Networks (IJCNN), 2025.

- C Karunathilaka, **S Wickramanayake**. *"Empirical Evaluation of Deep Learning Models for Long-Term Solar Power Generation Forecasting"*. In Proceedings of 5th International Conference on Advanced Research in Computing (ICARC) 2025.

- PH Panawenna, **S Wickramanayake**. *"Understanding Omitted Facts in Transformer-based Abstractive Summarization"*. In Proceeding of the Moratuwa Engineering Research Conference (MERCon) 2024.

- KD Pramod, WT De Silva, WU Thabrew, R Shariffdeen, **S Wickramanayake**. *"BUGSPHP: A dataset for Automated Program Repair in PHP"*. In Proceedings of the Mining Software Repositories, 2024.

- K Charuka, **S Wickramanayake**, TD Ambegoda, P Madhushan, D Wijesooriya. *"Sign Language Recognition for Low Resource Languages Using Few Shot Learning"*, In Proceedings of the International Conference on Neural Information Processing, 2023.

- PN Deelaka, DY De Silva, **S. Wickramanayake**, D. Meedeniya, S. Rasnayaka *"TEZARNet: TEmporal Zero-Shot Activity Recognition Network"*, In Proceedings of the International Conference on Neural Information Processing, 2023.

- B Karunarathne, V Nanayakkara, E Ranasinghe, M Ranasinghe, S Ahangama, **S Wickramanayake**, C Hettiarachchi.*"Analysis of the factors affecting successful completion of asynchronous online learning programs"*. In the Proceedings of the European Conference on e-Learning, 2023.

- D. Senarath, S. Tharinda, M. Vishvajith, S. Rasnayaka, **S. Wickramanayake**, D. Meedeniya, *"BehaveFormer: A Framework with Spatio-Temporal Dual Attention Transformers for IMU enhanced Keystroke Dynamics"*, In Proceedings of the International Joint Conference on Biometrics, (IJCB) 2023.

- D. Senarath, S. Tharinda, M. Vishvajith, S. Rasnayaka, **S. Wickramanayake**, D. Meedeniya, *"Re-evaluating Keystroke Dynamics for Continuous Authentication"*, In Proceedings of the International Conference on Advanced Research in Computing (ICARC), 2023. **(Best Paper Award in Human-Computer Interaction and Computer Vision Track).**

- V. Nanayakkara, B. Karunarathne, M. Ranasinghe, S. Perera., G. Amarasinghe, **S. Wickramanayake**, S. Ahangama, K. Mahadewa, C. Hettiarachchi and H. Yaggahavita. *"open.uom.lk: A Free Online Knowledge Sharing Platform"*, In Proceedings of the 21st European Conference on e-Learning, (ECEL) 2022.

- **S. Wickramanayake,** W. Hsu and M.L. Lee, *"Explanation-based data augmentation for image classification"*, In Proceedings of the Advances in Neural Information Processing Systems, 2021.

- **S. Wickramanayake,** W. Hsu and M.L. Lee, *"Comprehensible convolutional neural networks via guided concept learning"*. In 2021 International Joint Conference on Neural Networks (IJCNN), 2021.

- **S. Wickramanayake,** W. Hsu. and M.L. Lee. *"Flex: Faithful linguistic explanations for neural net-based model decisions"*. In Proceedings of the AAAI Conference on Artificial Intelligence, 2019.

- **S. Wickramanayake** and H.D Bandara, *"Poster: Enhancing Fuel Economy of Fleet Vehicles Through Real-Time Driver Monitoring and Feedback"*. In Proceedings of the 14th Annual International Conference on Mobile Systems, Applications, and Services Companion, 2016.

- **S. Wickramanayake** and H.D. Bandara, "Fuel consumption prediction of fleet vehicles using machine learning: A comparative study". In Proceedings of 2016 Moratuwa Engineering Research Conference (MERCon), 2016.

- S. Darshana, D. Fernando, S. Jayawardena, **S. Wickramanayake**, C. De Silva**,** *"Efficient PERCLOS and Gaze Measurement Methodologies to Estimate Driver Attention in Real Time"*, In Proceedings of the 5th International Conference on Intelligent Systems, Modelling and Simulation, 2014.

- K.U.G.S. Darshana, M.D.Y. Fernando, S.S. Jayawardena, **S.K.K. Wickramanayake, "***Riyadisi - Intelligent Driver Monitoring System*", In Proceedings of International Conference on Advances in ICT for Emerging Regions (ICTer), 2013.

Workshop Papers

- J Senevirathna, A Vininda, P Sandaruwan, R Shariffdeen, **S Wickramanayake,** ND Silva. "*FusionRepair: Iterative Multi-Line APR via Fusion*" In 6th International Workshop on Automated Program Repair, 2025.

- N Lamahewage, N Cooray, R Shariffdeen, **S Wickramanayake,** ND Silva. "*SCHOLIA-An XAI Framework for APR*" In 6th International Workshop on Automated Program Repair, 2025.

- **S. Wickramanayake,** W. Hsu, M. L. Lee. "*Towards Fully Interpretable Deep Neural Networks: Are We There Yet?*" In Explainable Artificial Intelligence Workshop - International Conference on Machine Learning, 2021.

Preprints

- L Akmeemana, C Attanayake, H Faiz., & S Wickramanayake, "*GAL-MAD: Towards Explainable Anomaly Detection in Microservice Applications Using Graph Attention Networks*". *arXiv preprint arXiv:2504.00058,* 2025.

- S. **Wickramanayake,** H.M. Bandara, N.A. Samarasekara, "Real-Time Monitoring and Driver Feedback to Promote Fuel Efficient Driving", arXiv preprint arXiv:2007.02728. 2020.

TALKS

- *"Human Understandable Explanations for Deep Learning Models Handling Sequential Data"* at the 2024 Meta Research Workshop, London.
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- *"Explainable Artificial Intelligence for Smart Cities"* at the 2022 Intelligent Sensing Winter School organized by the Center for Intelligent Sensing, Queen Mary University of London.

- *"Explainable Artificial Intelligence for Smart Cities"* at MERCon 2022 workshop on Trustworthy Machine Learning.

- *"Troubleshooting Deep Neural Networks Using Explanations"* at the 2022 International Conference on Linking Software Engineering, Artificial Intelligence, and Security.

- "*Research and Higher Education*" at Tech Talk Session, Sri Lanka Institute of Information Technology.

RESEARCH PROJECT SUPERVISION

MSc Thesis Advisor (On Going)

- Madushika Gamage
  Thesis Title: Explainable Artificial Intelligence for Multivariate Time Series in Smart Cities.
  Co-Supervisors: Prof. Dulani Meedeniya and Dr. Sanka Rasnayaka (NUS, Singapore)

- Shamodya Hashantha
  Thesis Title: A Défense Method Against Label-only Model Inversion Attack in Machine Learning.
  Co-Supervisor: Dr. Sunimal Rathnayaka

- Kasun Perera
  Thesis Title: Causal Attention-based Graph Neural Networks for Node Classification.

- Shamila Dasanayaka
  Thesis Title: Improved Surrogate-based Explainer for Product Recommendation.

- Pasadie Panawenna
  Thesis Title: Analysing Skipped Text in Abstractive Summarization Using Model Explanations.

- Chathushka Karunathilaka
  Thesis Title: Transformer-Based Approach for Solar Energy Forecasting

- Priyanka Perera
  Thesis Title: Transformers-based Virtual Flow Meter for Oil Well Production Optimization.

- Ruklan Kularatne
  Thesis Title: Large Language Models Assisted Learning for Effective Secondary Education.

MBA Thesis Advisor (Current)

- Geethani Subhashani
  Thesis Title: A Study to Investigate Privacy by Design in the Context of Software Development in Sri Lanka.
  Co-Supervisor: Dr. Thusitha Abeysekara (USJ)

- Shehan Chathuranga
  Thesis Title: How IT Companies Can Survive the Economic Crisis and Thrive.

- Hasitha Swarnasinghe
  Thesis Title: Achieving Sales Targets Through Digital Sales and Marketing During an Economic Downturn.

BSc Thesis Advisor (On Going)

- Nethum Lamahewage, Nimantha Cooray
  Thesis Title: Explainable Automated Repair.
  Co-Supervisor: Dr Nisansa De Silva, Dr Ridwan Shariffdeen (NUS, Singapore)

- DCJ Senevirathne, DLA Vindula, THPD Sandaruwan
  Thesis Title: An Automated Program Repair Tool to Generate Single-line and Multi-line Patches in a Single Line.
  Co-Supervisor: Dr Nisansa De Silva, Dr Ridwan Shariffdeen (NUS, Singapore)

- Nimsara Fernando, Chamod Madushanka, Sandun Induwara
  Thesis Title: PonziShield: A Real-time, Multimodal Framework for Ponzi DApps Detection.
  Co-Supervisor: Dr Dilum Bandara (Data61, Australia)

- Dinusha Anurudda, Udith Kaushalya, Harshana Eranda
  Thesis Title: Incremental Few-shot Learning for Low Resource Sign Language Recognition.
  Co-Supervisor: Dr Thanuja Ambegoda

BSc Thesis Advisor (Completed)

- Nipun Deelaka, Devin De Silva
  Thesis Title: Interpretable Zero-Shot Learning for Sensor-Based Human Activity Recognition.
  Co-Supervisors: Prof. Dulani Meedeniya, Dr. Sanka Rasnayaka (NUS, Singapore)

- Dilshan Senarath, Sanuja Tharinda, Maduka Vishvajith
  Thesis Title: Enhancing Behavioural Biometrics Using IMU Data.
  Co-Supervisors: Prof. Dulani Meedeniya, Dr. Sanka Rasnayaka (NUS, Singapore)

- Lahiru Akmeemana, Chamodya Attanayake, Husni Faiz
  Thesis Title: Explainable Anomaly Detection in Microservice Applications.
  Co-Supervisor: Dr Malith Perera (WSO2, Sri Lanka)

- Thushan Nirasha, Dushan Pramod, Udith Kavinda
  Thesis Title: Automated Repair for PHP Program Bugs Using Deep Learning.
  Co-Supervisor: Dr Ridwan Shariffdeen (NUS, Singapore)

- Maneesha Gunathilaka
  Thesis Title: DEFITRUST: Deep Learning-based Trust Estimation of DeFi Tokens Using Event Logs and Sentiment Analysis.
  Co-Supervisor: Dr Dilum Bandara (Data61, Australia)

- Dineth Wijesooriya, Pasan Madhushan, Kaveesh Madumal
  Thesis Title: Sign Language Recognition for Low Resource Languages Using Few Shots Learning.
  Co-Supervisor: Dr Thanuja Ambegoda

PAPER REVIEW FOR JOURNALS AND CONFERENCES

- Knowledge-Based Systems: 2025

- Engineering Applications of Artificial Intelligence: 2024, 2025

- IEEE Transactions on Emerging Topics in Computational Intelligence: 2023

- Expert Systems with Applications: 2021, 2022, 2023, 2025

- Transactions on Pattern Analysis and Machine Intelligence (TPAMI): 2021

- Tsinghua Science and Technology: 2021

- Transactions on Systems, Man and Cybernetics: 2021

- International Joint Conference on Neural Networks: 2023

- International Conference on Learning Representations (Tiny Papers Track) - 2023

- Workshop on eXplainable AI approaches for debugging and diagnosis at Conference on Neural Information Processing Systems: 2021 (Recognized as one of top five outstanding reviewers.)

- International Conference on Computer-Aided Design: 2021

- Women in Machine Learning Workshop at Conference on Neural Information Processing Systems: 2019, 2020

- Moratuwa Engineering Research Conference - 2017, 2018, 2019, 2022

ACHIEVEMENTS

- **Awardee** of Research Achievement Award, School of Computing, National University of Singapore, 2020

- **Scholarship winner** to attend the 14th ACM International Conference on Mobile Systems, Applications, and Services Singapore, 2016

- **Scholarship winner** to present a poster based on the final year project, Riyadisi, at Grace Hopper Celebration in Women in Computing Conference, India 2014, Organized by Anita Borg Institute for Women and Technology

- **Scholarship winner** to attend Grace Hopper Celebration in Women in Computing Conference, India 2013, Organized by Anita Borg Institute for Women and Technology

- **MIND Scholarship Holder**
  The MIND scholarship is awarded to final-year undergraduates based on their academic performance and extracurricular activities.

- **Semifinalist** – Inter-University Speech Contest 2011 organized by the Gavel Club, University of Kelaniya

- **Semifinalist** - Intra University Speech Contest 2011 and 2010 organized by Gavel Club, University of Moratuwa

TEACHING

University of Moratuwa, Sri Lanka

Postgraduate

- Co-Lecturer - CS5901: Research Seminar, MSc program (In22-S1, In22-S2, In23-S1)
- Co-Lecturer – CS5804: Advanced Deep Learning, MSc program (In23-S3)
- Co-Lecturer – CS5805: Information Visualization MSc program (In23-S3)

Undergraduate

- Co-Lecturer - CS3120: Introduction to Data Science (In19-S4, In20-S4)
- Co-Lecturer - CS3962: Research and Report Writing (In18-S6, In19-S6)
- Co-Lecturer - CS3202: Software Engineering Project (In19-S5)
- Co-Lecturer - CS3500: Data Science and Engineering Project (In19-S5)
- Co-Lecturer - CS3630: Deep Neural Networks (In19-S5)
- Co-Lecturer - CS3750: Data Visualization (In19-S6)
- Co-Lecturer - CS1040: Program Construction (In20-S2, In21-S2)
- Co-Lecturer - CS3613: Introduction to Artificial Intelligence (In20-S3)
- Lecturer – CS2842: Computer Systems (In14-S2)
- Lecturer - ITE 1412: Information Management Module (In21-S1, In21-S2, In22-S1)
- Co-Lecturer - DA134: Data Structures and Algorithms (In21-S2)

Short Courses

- Lecturer - Information visualization for data-driven decision-making. 2023

National University of Singapore, Singapore (As a Teaching Assistant)

Postgraduate

- 2019/2020 Sem 2 - CS5260 - Neural Networks and Deep Learning II by Prof. Hwee Kuan Lee
- 2018/2019 Sem 2 - CS5228 - Knowledge Discovery and Data Mining by Prof. Wynne Hsu and Prof. Ng See Kiong
- 2018/2019 Sem 1 - CS5242 - Neural Networks and Deep Learning by Prof. Hwee Kuan Lee

Undergraduate

- 2019/2020 Sem 1 - CS2309 - CS Research Methodology by Prof. Wynne Hsu
- 2017/2018 Sem 2 - CS2102 Database Systems by Prof. Stephane Bressan and Prof. Chee Yong Chan
- 2017/2018 Sem 1 - CS2102 Database Systems by Prof. Mong Li Lee and Prof. Stephane Bressan

University of Vocational Technology, Sri Lanka (As a Visiting Lecturer)

- Lecturer - IT60405: Information System Management (2015, 2016)

UNIVERSITY SERVICES

- Coordinator – CSE Mentoring Program 2023
- Academic Coordinator – Semester 2 (2022, 2023)
- Member, Timetable Committee (2023)

LEADERSHIP ROLES

University Level (As a Lecturer):

- **Main Organizer** – CSE Welcome for Batch 2021 – (27th February 2023)

- **Main Organizer** – Workshop on Trustworthy Machine Learning, MERCon 2022 – (29th July 2022)

- **Organizing committee member –** International Symposium on Applied Analytics for a Smart Society – Colombo, Sri Lanka **– (**31st August 2016 – 1st September 2016)
  This was organized by the Faculty of Graduate Studies, the University of Moratuwa in partnership with the School of Information Systems, Singapore Management University.

- **Organizing committee member** – Business Analytics Techniques Workshop organized by University of Moratuwa – (6th September 2016 – 7th September 2016)

- **Secretary** (2016 - Present) –Toastmasters Club, University of Moratuwa

University Level (As an Undergraduate):

- **Secretary** (2012 – 2013)**, Assistance Secretary** (2011 –2012), **Project Co-chair** (Orientation Program 2011) – **Gavel Club**, University of Moratuwa
Gavel Club is an affiliate of Toastmasters International in whose main expectation is to enhance the communication skills and leadership skills of the members.

- **Batch Representative** (2011– 2012) - 2009 Batch, Department of Computer Science and Engineering, University of Moratuwa

- **Organizing committee member** – IPV6 Day – Sri Lanka (April 2011– June 2011)
An event organized by the Department of Computer Science and Engineering, the University of Moratuwa, in collaboration with IESL (Institute of Engineers Sri Lanka) and TechCERT, parallel to the World IPv6 Day Organized by Internet Society with the intention of assessing the IPv6 readiness in Sri Lanka.

VOLUNTARY WORK

- **Area Chair -** Women in Machine Learning Workshop at Conference on Neural Information Processing Systems   2022

- **Super-Volunteer -** Women in Machine Learning UN-Workshop at International Conference on Machine Learning   2022

- **Super-Volunteer -** Women in Machine Learning Workshop at Conference on Neural Information Processing Systems   2021

- **Poster Mentor -** Women in Machine Learning Workshop at Conference on Neural Information Processing Systems   2020

- **Mentor** in Google Code In 2014 for FOSSASIA   Nov 2014 – Jan 2015
- **Article Writer** - MoraSpirit   Jan 2013 – Nov 2013
- **Co-editor -** CSE News Magazine   March 2013 – Dec 2013

PROFESSIONAL MEMBERSHIP

- **Associate Member (AM-18141)** – Institute of Engineers Sri Lanka
- **Member (5005388)** – Toastmasters International