

Dilshara Herath

Research Assistant - Multidisciplinary AI Research Centre, University of Peradeniya

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 Personal Website |  Google Scholar

RESEARCH INTERESTS

My research interests are in **deep learning, signal and image processing, computer vision** and their **applications**.

EDUCATION

Bachelor of the Science of Engineering Honours (B. Sc. Engineering) May 2020 – March 2025

Specialized in Electrical and Information Engineering

University of Ruhuna

- **GPA: 3.79/4.00 (First-Class Honours) | Rank: 3/75 (Dept.) | [Transcript](#)**
- The complete degree program was conducted and assessed in **English medium** and accredited by the **Washington Accord | [Accreditation](#)**

Trinity College Kandy, Grade 1-13

Jan 2005 – Aug 2018

- G.C.E. Advanced Level Examination: Combined Mathematics, Chemistry, Physics (AAB)

CURRENT APPOINTMENT

Research Assistant and Project Coordinator

March 2025 – Present

Multidisciplinary AI Research Centre ([MARC](#)), University of Peradeniya

TEST SCORES

IELTS (03rd November, 2025) | **Overall Band Score: 7.5 | [Test Report](#)**

PUBLICATIONS

J=Journal, C=Conference

- [J 1] ELF Radio Sensing and AI-Perception of Micro-UAS Without Radar Emissions
IEEE Sensors Journal (IF - 4.5) | [DOI](#)
[Dilshara Herath](#), Supun Ganegoda, Sudeepa Ranasinghe, Chatura Seneviratne, Soumyajit Mandal, Hiruni Silva and Arjuna Madanayake
Contribution: Conceptualization, Methodology, Formal analysis, Software, Hardware, Validation, Writing-Original Draft, Review & Editing.
- [C 1] GAN-Driven Signal Denoising and Enhancement for Robust Drone Motor Detection
IEEE IECON 2025, Madrid, Spain | [DOI](#) | [Presentation](#)
[Dilshara Herath](#), Chinthaka Abeyrathne, Supun Ganegoda, Chatura Seneviratne, Harindra S. Mavikumbure
Contribution: Conceptualization, Methodology, Formal analysis, Software, Validation, Writing-Original Draft, Review & Editing.
- [C 2] Unveiling Misalignment Fault Severities: A Novel SCD-CNN Framework for Rotating Machinery
MERCon 2025, 11th international conference, University of Moratuwa | [DOI](#) | [Presentation](#)
[Dilshara Herath](#), Chinthaka Abeyrathne, Chamindu Adithya, Chatura Seneviratne
Contribution: Conceptualization, Methodology, Formal analysis, Software, Validation, Writing-Original Draft, Review & Editing.
- [C 3] AI-Enabled RF-Sensing for Radar Detection of Body-Worn IEDs

IEEE SoutheastCon 2024, Atlanta, Georgia, USA | [DOI](#) | [Presentation](#)

Kumudu Senarathne, Ashan Hatharasinghe, Wathsala Seram, [Dilshara Herath](#), Chatura Seneviratne, and Arjuna Madanayake

Contribution: Validation, Writing–Original Draft, Review & Editing.

- [C 4] FlowSegModel: Advancing Perception in Autonomous Driving Through Weather-Resilient Segmentation | [DOI](#) | [Presentation](#)

ICIIS 2025, International Conference on Industrial and Information Systems

[Dilshara Herath](#), Oshada Rathnayake, Thiwanka Alahakoon, Sanjula Senadeera, Roshan Godaliyadda, and Parakrama Ekanayake

Contribution: Conceptualization, Methodology, Formal analysis, Software, Validation, Writing–Original Draft, Review & Editing.

- [C 5] AI-Native Detection and Localization of UAS via Multi-Antenna ELF Passive Sensing

IEEE RFID 2026, USA (Accepted - to be Published)

Ravisha Hapuarachchi, Anuththa Rathnayaka, Thamindu Virajith, Duleen Wickramasriya, [Dilshara Herath](#), Chatura Seneviratne, Arjuna Madanayake

Review & Editing.

Detection of Body-Worn Improvised Explosive Devices | [Poster](#)

USF Artificial Intelligence + X Symposium organized by University of South Florida.

Contribution: Research Poster

ACHIEVEMENTS

IEEE IES Generative AI Challenge 2025 | [View](#)

July 2025

- **Global Winners** from 305 projects from 28 countries.
- Travel **grant worth USD 3000** to attend the conference in person in Madrid, Spain.

National Winners: IEEE Innovations Sri Lanka Competition | [View](#)

Dec 2024

- Final year project "Micro-UAS Detection Using ELF and Machine Learning", emerged as the Top in the Island among 30 teams from all the provinces.

Provincial Winners: IEEE Innovations Sri Lanka Competition | [View](#)

Oct 2024

- Presented the final year project on Drone detection, emerged top in the Southern Province and selected to the all island competition.

2nd Runner-up: Undergraduate Thesis Project Competition | [View](#)

Oct 2024

- Presented the final year project on drone detection as a poster presentation for the competition organized by the IEEE Signal Processing Society Chapter Sri Lanka, in collaboration with the Center for Telecommunication Research (CTR), SLTC Research University.

Best Paper Award Nominee - MERCon 2025

Aug 2025

- Track - Image Processing and Computer Vision

SELECTED PROJECTS

Computer Vision based Solar Irradiance Forecasting | [Project](#)

Aug 2025 - Present

- Developed a hybrid deep learning pipeline for 20-minute ahead solar irradiance forecasts, integrating Vision Transformers for sky images and Time Series Transformers for meteorological data.
- Implemented fish-eye image undistortion and advanced cloud segmentation (UcloudNet, red-to-blue thresholding). Led dataset preparation, regression fusion, and comparative analysis for short-term forecasting under variable conditions.

- **Contribution:** Developing the complete DL pipeline, image undistortion, training and validation.

Agent Based Modeling for Human-Animal Behavior | [Project](#)

March 2025 - Present

- Built Python agent-based models for analyzing elephant and Baboon telemetry; designed and compared CRW and Lévy walk using GPS data.
- Conducted ecological fit evaluation with visualizations of actual vs. simulated trajectories and movement patterns.
- **Contribution:** Developing motion models-CRW and Levy walk, comparing model performance

Optical-Flow Driven Semantic Segmentation for Autonomous Driving | [Paper](#)

March - Aug, 2025

- Fine-tuned optical flow (RAFT/SEA-RAFT), conducted ablation studies, and validated multi-metric performance across seven semantic classes.
- Created a DeepLabV3-based semantic segmentation architecture fusing RGB and optical flow for robust perception under adverse weather.
- **Contribution:** Developing the FlowSegModel, training and validation.

Extremely Low Frequency (ELF) based Sensing and AI/ML-based Identification of Micro-UAS - Final Year Project | [Poster](#) | [Youtube](#)

Jan – Oct, 2024

- Designed custom antennas and PCBs to capture extremely low frequency electromagnetic signatures from drone motors.
- Engineered DSP pipeline with MATLAB, implementing SCD feature extraction and advanced CNN architectures for real-time drone detection.
- Integrated system outperformed conventional passive detection under noisy, covert conditions.
- **Contribution:** PCB design using Altium, signal processing implementation using python and MATLAB, DL pipeline.

GAN-Driven Signal Denoising and Enhancement | [Slides](#)

March - June, 2025

- Developed and integrated a GAN-based denoising framework to enhance ELF drone motor signals and detection accuracy in noisy settings.
- Elevated classification accuracy by 24% over baseline when deployed in ML pipeline.
- **Contribution:** Implementing GAN-based framework, integrating GAN model into the DL pipeline, training and validation.

Leveraging Spectral Correlation Density Imaging with Deep Learning for Intelligent Fault Detection in Rotating Machinery | [Slides](#)

Jan - April, 2025

- Created SCD-CNN pipeline to classify shaft misalignment faults using vibration data.
- Benchmarked multiple CNN architectures; preparing for power plant-scale validation and model re-training on industrial data.
- Future work: Collaboration with Lakdhanavi Power Plant, Sri Lanka to train and validate industrial vibration data from operational rotating machinery.
- **Contribution:** Implementing SCD-CNN pipeline, training and validation.

AI-Enabled RF-Sensing for Radar Detection of Body-Worn IEDs | [Poster](#)

Jan - Nov, 2023

- Developed an RF-sensing radar system for standoff detection of body-worn improvised explosive devices (IEDs), integrating full-wave electromagnetic simulations with deep learning classification.

- **Contribution:** Improving the CNN architecture, Preparing the manuscript.

TECHNICAL STRENGTHS

- **Programming Languages:** Python (Proficient), C++ , MATLAB
- **Libraries & frameworks:** TensorFlow, PyTorch, Scikit-Learn, Keras, cv2, Scipy, MVTec Halcon
- **PCB Design :** Proteus, Altium
- **Other:** Git, Linux, Jupyter Notebook, AutoCAD, Draw.io
- **Soft Skills:** Communication, Teamwork and Collaboration

TEACHING EXPERIENCE

- Teaching Assistant**, Laboratory Practicals Jan 2024 – Oct 2024
- EE4301 - Communication Systems 1
 - EE2201 - Fundamentals of Electronics
- Co-Supervisor**, Undergraduate Research Projects Aug 2025 – Present
- EEG-based Smart Biomedical System for Chronic Diseases Monitoring
 - Clinical Decision Support Systems: Brain Tumor Segmentation

INDUSTRIAL EXPERIENCE

- Machine Learning Engineer, Intern**, Ansell Lanka Nov 2024 – Feb 2025
- Designed a Halcon- and Python-based machine vision system for HGBU glove manufacturing lines to automate visual inspection.
 - Implemented and optimized image-processing pipelines to integrate machine vision into existing production lines, improving defect detection accuracy.
- Telecommunications Engineer, Intern**, Sri Lanka Telecom Mobitel Oct 2023 – Jan 2024
- Supported IP Network Operations with traffic monitoring, congestion control, penetration testing, and SOC-based security monitoring.

VOLUNTEERING EXPERIENCE

- Multidisciplinary AI Research Centre (MARC)**, University of Peradeniya Mar 2025 – Present
- Conducting workshops on AI for learning and research for high school students and undergraduate students at Ampara and Vavuniya districts.
 - Handling the media team of MARC.
- Volunteer of the IEEE Student branch** 2022-2023
- Organized university events organized by IEEE student branch of University of Ruhuna.

EXTRACURRICULAR ACTIVITIES

- Captain of the Engineering Faculty Soccer team** 2023-2024
- Played for the University Soccer team
 - Held the Vice-Captain for the year 2022 and won the Inter-Faculty Football championship.
- Soccer Team - Trinity College** 2011-2016
- Played for under 13, 15, 17, and 18 age categories for the school soccer team
 - Central province soccer tournament-2nd Runner-up, Participation to National Soccer Championship

2015.

President-Telecommunication and Networking Circle 2024

- Organized Cloud platform workshops, Career Fair.

Organizing Committee Vice President for Partnership Development for the national project NATCON 2022 for AIESEC Sri Lanka 2022

- Raised the biggest partnership with Rs.350,000 for the conference with Stax LLC, a global strategy consulting firm.

Leadership positions in AIESEC in Sri Lanka | [Service Letter](#) 2021-2022

- Team Leader for the Information Management team under the division Product Marketing and IM.
- Team leader for International Relations under the section Outgoing global Talent/Teaching.
- Organizing Committee Vice president for External Relations for the project Youth Space organized by AIESEC in University of Ruhuna. Was able to raise the biggest partnership with AOD Colombo (Academy Of Design).

Gaveshakayo Hiking club of University of Ruhuna 2021-2024

- Editor of the Gaveshakayo hiking club of university of Ruhuna.

REFERENCES

Dr. Chatura Seneviratne

Senior Lecturer,
Department of Electrical and Information Engineering,
University of Ruhuna, Sri Lanka.

Email: chatura@eie.ruh.ac.lk

Relationship: Project Supervisor, Academic Advisor

Prof. Roshan Godaliyadda

Professor,
Department of Electrical and Electronic Engineering,
University of Peradeniya, Sri Lanka.

Email: roshang@eng.pdn.ac.lk

Relationship: Project Supervisor

Prof. Parakrama Ekanayake

Professor,
Department of Electrical and Electronic Engineering,
University of Peradeniya, Sri Lanka.

Email: mpb.ekanayake@ee.pdn.ac.lk

Relationship: Project Supervisor