Dilshara Herath

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Introduction

A driven and innovative researcher with a deep passion for advancing in Machine Learning and Bio-Medical Engineering. With hands-on experience in developing cutting-edge AI solutions, presenting at international conferences, and publishing impactful research, I thrive on solving complex problems that bridge theory and real-world applications. Eager to contribute to transformative projects that expand the boundaries of AI and create meaningful, scalable impact in areas such as healthcare, security, and beyond.

Education

University of Ruhuna, BSc in Electrical and Information Engineering — May 2020 – Oct 2024

- **GPA: 3.78/4.00 (First Class Honours)**

Trinity College Kandy, Grade 1-13 — Jan 2005 – Aug 2018

- G.C.E. Advanced Level Examination: Combined Mathematics, Chemistry, Physics (AAB)
- G.C.E. Ordinary Level Examination: 9As

Publications

AI-Enabled RF-Sensing for Radar Detection of Body-Worn IEDs — Jan 2024

Published a paper at the IEEE International Conference SoutheastCon 2024. Presented the paper virtually by joining the conference held in Atlanta, Georgia, USA.

10.1109/SoutheastCon52093.2024.10500269.

ELF Radio Sensing and AI-Perception of Micro-UAS Without Radar Emissions — Dec 2024 - Present
(In Preparation - Journal Article)

Journal article to be published in **IEEE Transactions on Aerospace and Electronic Systems.**

AI Enabled Detection of Body-Worn Improvised Explosive Devices — Dec 2023

Abstract submission at USF Artificial Intelligence + X Symposium organized by University of South Florida. Creating the Research Poster for the accepted abstract.

Research Experience

Research Assistant at Multidisciplinary AI Research Centre (MARC) - University of Peradeniya — Feb 2025 – Present

- Optimizing algorithms on RAFT (Recurrent All-Pairs Field Transforms) and SEA-RAFT for Optical Flow
- Implementing agent-based modeling for urban planning, transportation, and socioeconomics.
- Developing Multimodal Machine Learning pipelines for AI-Assisted Early Detection of Oral Cancer

Extremely Low Frequency (ELF) based Sensing and AI/ML-based Identification of Micro-UAS - Final Year Project — Jan 2024 – Oct 2024

- Developed a drone detection system to identify drones at a safe distance for military purposes.
- Developed convolutional neural networks using transfer learning of Keras and a Vision Transformer to classify images of the SCD (Spectral Correlation Density) spectrograms obtained by cyclostationarity property analysis.
- Contribution: PCB design using Altium, signal processing implementation using python and MATLAB, developing CNN model architectures through transfer learning, and vision transformers.

Teaching Experience

EE4301 - Communication Systems 1, Laboratory Practicals — Jan 2023 – Oct 2024
EE2201 - Fundamentals of Electronics, Laboratory Practicals — Jan 2023 – Oct 2024

Industrial Experience

Machine Learning Engineer, Intern, Ansell Lanka — Nov 2024 – Feb 2025

- Designed a machine vision system to the HGBU (Healthcare Glove manufacturing) lines to reduce the headcount.
- Working with Halcon and Python to integrate machine vision capabilities to the manufacturing lines.
- Using various image processing techniques to enhance the fault detection

Cybersecurity Engineer Intern, Sri Lanka Telecom Mobitel — Oct 2023 – Jan 2024

- Traffic monitoring and congestion control using Cacti Software in Linux Servers under the section IP Network Operations.
- Performed penetration testing and ethical hacking using Kali Linux tools such as NMap, MobSF.
- Network security monitoring through the SOC (Security Operations Center) using software; IBM QRadar, Darktrace, Microsoft Defender Endpoint.

Projects

Leveraging Spectral Correlation Density Imaging with Deep Learning for Intelligent Fault Detection in Rotating Machinery - March 2025 - Present

- Implemented a bearing fault detection system combining SCD imaging for cyclostationary feature extraction with computationally efficient CNN architectures using transfer learning.
- Evaluated on a publicly available Rotating Machinery Vibration Dataset
- Contribution: matlab and python scripts for signal processing algorithms,implementing transfer learning methods for evaluation

Generative AI to synthesize realistic ELF/VLF signals that mimic real-world data distributions. March 2025 - Present

- Using a GAN based architecture to denoise low frequency signals used for drone detection.
- Using AutoEncoders and diffusion models to generate new synthetic data for low frequency signals.
- Contribution: Implementing signal processing pipeline, training and evaluating the GAN-based model.

AI-Enabled RF-Sensing for Radar Detection of Body-Worn IEDs Jan 2023 - Nov 2023

- Designed a deep neural network using TensorFlow to identify IED (Improvised Explosive Devices).
- The neural network consist of 7 dense layers. Obtained a 96% of average detection accuracy.
- Contribution: Improving the CNN architecture, Preparing the manuscript.

Breast Cancer Prediction using Machine Learning Feb 2024 - May 2024

- Developed a machine learning model for breast cancer prediction for the Wisconsin dataset.
- Trained Support Vector Machine, K-Nearest Neighbors, Decision Trees, Random Forest machine learning models to compare and choose the best fit model for the dataset.
- Contribution: Desigining machine learning pipeline, training and evaluating ML models

Hand Written Digit Identification using Computer Vision Feb 2024 - June 2024

- Built a CNN model using OpenCV to detect and classify hand written digits.
- Real time prediction of digits captured by the camera

Deep Drowsiness Detection Using YOLOv5, PyTorch, and Python Oct 2024 - Dec 2024

- Developed a real-time drowsiness detection system using YOLOv5 and OpenCV, enabling accurate live monitoring and alerting.
- Fine-tuned custom drowsiness models with PyTorch, optimizing performance on images and videos.

News Research Tool - Equity Research Analysis ChatBot Model Nov 2024 - Dec 2024

- Building a chatbot research tool using LangChain, OpenAI and streamlit.

Intelligent Patient Care Platform Website and Mobile App Development Jan 2022 - Dec 2022

- Mobile app development using Flutter, Front End development using React.)

Awards and Achievements

1st Place in All Island Competition: IEEE Innovations Sri Lanka Competition Dec 2024

- I presented our final year project "Micro-UAS Detection Using ELF and Machine Learning", which tackles modern security challenges by detecting drones and emerged as the Top in the Island among 30 teams from all the provinces.

1st Place in Southern Province: IEEE Innovations Sri Lanka Southern Province Competition Oct 2024

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

3rd Place: Undergraduate Thesis Project Competition Oct 2024

- I presented our 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.

IEEE INSL Investor Lounge 2024 Dec 2024

- I presented our final year project on drone detection at the competition to pitch the investors for the project.

Skills and Certification

- **Programming Languages and Frameworks**: Python, C++, MATLAB, TensorFlow, PyTorch
- Certifications:
  - Supervised Machine Learning: Regression and Classification - Certificate
  - AI/ML Engineer - Stage 1 - Certificate
  - Introduction to Generative AI - Certificate
  - Introduction to TensorFlow for Artificial Intelligence, Machine Learning, and Deep Learning - Certificate
  - Foundations: Data, Data, Everywhere (Data Science) - Certificate
  - Programming for Everybody (Getting Started with Python) - Certificate
  - AWS Cloud Technical Essentials - Certificate
  - Blockchain Basics - Certificate

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.

Member of the Trinity College Soccer Team 2011-2016

- Played for under 13, 15, 17, and 18 for the college soccer team
- Obtaining 3rd place - Central province soccer tournament
- Getting selected to the All Island Soccer Championship 2015 held in Jaffna.

President - Telecommunication and Networking Circle Faculty of Engineering 2024

- Organized an Introduction to Cloud platform workshop.
- Working with the Career Fair Organization team for making partnerships.

Volunteer of the IEEE Student branch 2022-2023

- Organized university events organized by IEEE student branch of University of Ruhuna.

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

- I raised the biggest partnership with Rs.350,000 for the conference with Stax LLC, a global MA strategy consulting firm.(December 2021)

Leadership positions in AIESEC in the University of Ruhuna 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) for the event.

Gaveshakayo Hiking club of University of Ruhuna 2021-2024

- Editor of the Gaveshakayo hiking club of university of Ruhuna.(2023)
- Covered 60+ hikes and waterfall hunting in Sri Lanka.

References

Dr. Chatura Seneviratne

Senior Lecturer,
Department of Electrical and Information Engineering,
University of Ruhuna, Sri Lanka.
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Relationship: Project Supervisor, Academic Advisor

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Relationship: Project Supervisor

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Relationship: Head of the Department