Linuk Perera

MIET, MBCS | linukperera402@gmail.com | +94 77 374 4055
LinkedIn | GitHub | Portfolio

Profile

I am a masters student in electronic and electrical engineering, working at the intersection of electrical engineering, computing, and applied machine learning, with a focus on systems that understand human movement and intention. I am motivated by the idea that intelligent interfaces should feel intuitive and accessible, ultimately expanding how people interact with technology in their everyday environments. My research interests lie in gesture recognition, vision-language models, and hardware optimization for AI systems in real-world environments.

Research Interests

Generative AI & NLP: LLM Architectures, Pipelines and Model Verification

Embedded AI & Hardware Co-design: Optimizing heavy ML architectures (Transformers) for Hardware.

Computer Vision & Robotics: DSP and Intelligent Systems

ViT & VLM: Vision Models for Intelligent Systems

Education

MSc Electronic and Electrical Engineering **Expected Sep 2026**
Anglia Ruskin University *United Kingdom*
Research Focus: Intelligent Systems & VLM Architectures for Resource-Constrained Environments.
Core Modules: Advanced Digital Signal Processing, Sensing & Sensor Fusion, Industrial Process Control.

Bachelor of Engineering in Electrical and Electronics **July 2025**
University of Hertfordshire *First Class Honors*
Major Project: Neural Network Driven AR for Gesture Control (83% — 3rd all-time Highest in University Records).
Notable Modules: Intelligent Systems & Robotics, Digital Signal Processing, Microelectronics & VLSI.

PGDip Information Technology **May 2024**
British Computer Society (BCS HEQ) *Equivalent to UK Honours Degree*
Major Project: Natural Audio to MIDI Converter.
Notable Modules: Software Engineering I & II, ADBMS & Networking.

Ongoing Research Initiatives

Restoration & Vectorization of the Pali Canon *Internationally Funded*
Developing a specialized Large Language Model (LLM) pipeline utilizing Vector Storage (RAG) to digitize, restore, and semanticize the Pali Canon and Holy Dharma for preservation.
Examining methods to accurately tokenize ancient linguistic structures, creating a semantic query engine for scholarly research.

Vision Transformer (ViT) Architectures for Gait Recognition *Current Research*
Investigating attention-based mechanisms in Transformers to analyze gait patterns for non-invasive biometric identification.
Examining model robustness against occlusion and viewing angle variations to improve localization accuracy in complex environments.

Resource-Constrained Seizure Detection *Current Research*
Designing a lightweight Multi-Layer Perceptron (MLP) architecture with a single, manually tuned weight set optimized for ultra-low-power edge devices.
Discovered methods to eliminate heavy retraining on hardware, enabling efficient deployment on constrained systems.

Skeletal Segmentation for Complex Objects on Limited Datasets *Current Research*
Developing novel segmentation algorithms to accurately extract skeletal structures from complex objects where training data is sparse.
Utilizing skeletal grids to confirm the positive mask area and map the boundary of the object smoothly by calculating Fourier Loss.

Writing Experience: Publications & Papers

Peer-Reviewed Publications

Quantitative Financial Modeling for Sri Lankan Markets: Approach Combining NLP, Clustering and Time-Series Forecasting *Published 2025*

Role: First Author. Published in **IET Annual Technical Conference (ATC) 2025**. Proposed a hybrid model integrating NLP-based sentiment analysis with clustering & time series forecasting techniques for predicting market movement.

Demonstrated a deployable framework for emerging markets, achieving a 12% improvement in prediction accuracy over traditional models. **Awarded 2nd Runner Up Research of the Conference.**

Wireless Frequency Monitoring and Trend Analysis System *Published 2024*

Role: First Author. Published in **IET Annual Technical Conference (ATC) 2024**. Detailed the design of a portable wireless oscilloscope with integrated ML for trend prediction.

Bridged hardware instrumentation with predictive analytics, enabling real-time frequency trend analysis on portable devices.

Accepted & In-Press

Towards an Intelligent Digital Twin Framework for Telecommunications Networks in Emerging Economies *Accepted 2026*

Role: First Author. Accepted for **IET Digital Twins & Applications (DTA APAC) 2026**. Proposed a novel framework for deploying Digital Twins in developing nations.

Demonstrated that edge-optimized AI can bypass expensive infrastructure requirements, enabling cost-effective network optimization.

Manuscripts in Preparation

Dynamic Gesture Recognition for AR Systems *Pre-Press*

Role: First Author. Targeting International Journal. Investigated novel methods to achieve Dynamic Gesture Recognition.

Implemented two novel algorithms for dynamic weighting calculation algorithms to optimize LSTM, DNN and ST-GCN models alongside a proposed lightweight ViT architecture.

Cross-Mission Exoplanet Classification *Pre-Press*

Role: First Author. Targeting International Conference. Optimizing novel model architectures for NASA KOI, K2, and TESS datasets.

Implemented novel finetuning and Verification pipelines to enhance model generalization across different mission datasets.

Professional Experience

Intern Machine Learning Engineer **Jul 2025 – Present**
Sri Lanka Telecom PLC *Colombo, Sri Lanka*

Spearheaded the Digital Twin Research and Implementation, integrating LLMs and Physics ML Hybrid Models.

Improved network adaptability by analyzing real-time physical sensor data and integration of a live bi-directional Twin.

AI Solutions Engineer (Consulting) **Dec 2025 – Present**
Ceylon Green Bees *Colombo, Sri Lanka*

Leading the development of AI-driven solutions for local and foreign clients in a wide range of industries.

Designing scalable AI and ML pipelines to make cost efficient and robust applications.

Intern Electronics Engineer (R&D) **Sep 2025 – Dec 2025**
Idea8 *Kottawa, Sri Lanka*

Led CPU optimization delivering a 43% system efficiency improvement by identifying memory bottlenecks.

Developed a novel object segmentation methodology leveraging Fourier Loss, achieving a 96% DICE coefficient.

Research Intern in AI and Data Analytics **May 2025 – Oct 2025**
Asha Securities *Remote / Hybrid*

Achieved a 24% accuracy improvement in market predictions by developing hybrid NLP-Clustering models.

Engineered an LLM solution handling 40% of portfolio queries autonomously, significantly reducing manual research workload.

Trainee Engineer **Jun 2024 – Jan 2025**
Sri Lankan Airlines *Bandaranaike International Airport*

Built an autonomous IoT Environmental Monitoring System, reducing the previously manual report generation time by 80%.

Developed a DFDR/QAR (Blackbox) readout framework reducing post-flight data extraction time by 50%.

Selected Technical Projects

Smart IoT Buoy for Oceanic Debris Monitoring *2025*
Designed a solar-powered buoy with Edge AI on ESP32, <124KB RAM, and 10+ km LoRa telemetry.
Implemented mathematically optimized FOMO models to enable low-cost, mass-deployable ocean monitoring.

Loan Default Risk Prediction System for SME Lending Platform *2025*
Built an ML model using Logistic Regression, Random Forest, and Gradient Boosting, improving classification by 34%.
Enhanced risk assessment capabilities for SME lending platforms using structured credit and behavioral data.

Customer Risk Stratification for Digital Insurance Firm *2025*
Developed K-Means, DBSCAN, and Decision Tree models, increasing underwriting efficiency by 27%.
Automated risk scoring and policy pricing alignment through advanced clustering techniques.

Environment Monitoring & Infographics System – Sri Lankan Airlines *2024*
Built an AI-enhanced IoT system reducing processing time by up to 80% with automated reporting and live warnings.
Ensured regulatory compliance through real-time data visualization and automated alert mechanisms.

Wireless Frequency Monitor – Hardware Instrumentation System *2024*
Designed a portable oscilloscope with Bluetooth-enabled PCB and embedded C++ acquisition for real-time inspection.
Integrated predictive analytics to forecast frequency trends directly on the portable device.

Power Electronics DC Motor Control System *2024*
Built a variable-speed H-Bridge drive with PWM control and simulated dynamic load behavior in MATLAB/Proteus.
Modeled current-speed characteristics to optimize control algorithms for varying load conditions.

Smart Load Balancer for Microgrids *2024*
Developed AI-driven load balancing with regression forecasting, improving energy efficiency by 15% using ESP32.
Implemented real-time demand sensing to optimize power delivery across microgrid nodes.

Audio to MIDI Converter & Web App *2023–2024*
Created an FFT and matrix convolution pipeline, improving MP3/WAV-to-MIDI analysis speed by 40%.
Enabled faster real-time conversion of audio signals to MIDI format for music production applications.

Colour Generation & Detection System *2024*
Built a TCS3200 color detection module on Mbed LPC1768 and Arduino for real-time industrial automation.
Implemented robust sensor logic to accurately identify and classify colors in industrial environments.

Acoustic Camera Trigger System *2023*
Engineered a sound-trigger circuit with precision rectifiers, Schmitt triggers, and opto-isolation for safety.
Achieved low-latency sound detection for high-speed photography applications.

Personal Portfolio Webapp *2024*
Built an ML-enhanced Next.js portfolio with SCSS, GSAP, and Framer Motion, improving engagement by 50%.
Integrated real-time data visualization to showcase technical projects and research outputs.

Business Processes Re-Engineering – Sri Lankan Airlines *2024*
Led digital workflow transformation, creating manuals and process maps to improve cross-department coordination.
Reduced audit preparation time by 20% and improved compliance traceability.

Awards, Grants & Funding

Government Funding Grant – Digital Twin Implementation *2025*
Secured funding to transition the ”Intelligent Digital Twin Framework” to physical implementation.

International Funding Grant – Pali Canon Restoration *2025*
Awarded grant for the digitization and semantic vectorization of the Pali Language Canon.

Volunteer of the Year 2024 *Institution of Engineering and Technology (IET) YPN*

Second Runner Up Research of the Conference *IET Annual Technical Conference 2025*

Global Nominee Winner *NASA Space Apps Challenge*

First Runner Up *SLIIT Code Fest Hackathon (Innov IoT Competition)*

Presentation Experience

Conference Speaker: Presented at IET ATC 2024 and 2025 (Published Author).

Hackathon Pitch: Presented winning solutions at NASA Space Apps and SLIIT Code Fest.

Panel Moderator: Moderated expert panel discussions for the IET (2024).

Product Pitch: Successfully Pitched My Fintech Product to the Chairman of the CSE (2025).

Product Pitch: Successfully Pitched My Startup for Venora Lanka's Estimation Software development project (2025).

Technical Skills

- **Machine Learning & AI:** Deep Learning, Transformers & LLMs, TensorFlow, PyTorch, Scikit-learn, Graph Neural Networks (ST-GCN), Probabilistic Modeling, Time-Series Forecasting, Optimization Methods (Adam, SGD, L-BFGS), Computer Vision (FFT/Convolution, Feature Extraction), Reinforcement Learning, FinBERT.
- **Signal Processing & Control:** DSP (FFT, Filtering, Spectral Analysis), Adaptive Filters, Control Systems (PID, State-Space), Kalman Filtering, Power Electronics Modeling, System Identification, Embedded Control (PWM, H-Bridge).
- **Embedded Systems & Edge Computing:** ESP32, ARM Cortex, FPGA (VHDL/Verilog), Mbed OS, Raspberry Pi, RTOS, Edge AI Deployment (TensorFlow Lite, Quantization, Model Compression), Hardware–Software Co-Design, IoT Sensor Networks, LoRa, Bluetooth, PCB Design (KiCad).
- **Scientific Computing & Simulation:** MATLAB, Simulink, LabVIEW, Proteus, Multisim, Numerical Methods, Optimization & Simulation, Modeling of Power Systems, Microgrid Simulation, Signal/Control Co-Simulation.
- **Software Engineering & Systems:** Python, C/C++, Java, C#, JavaScript, TypeScript, React.js, Node.js, Next.js, Data Pipelines, API Design, Real-Time Systems, Parallel Computing, Git, CI/CD, Linux/Unix Environments.
- **Cloud, DevOps & Data Infrastructure:** AWS (Lambda, TwinMaker, EC2, S3), Azure, Firebase, Docker, Serverless Compute, Real-Time Database Systems, Message Queues, MLOps Foundations.
- **Mathematics & Theoretical Foundations:** Linear Algebra, Statistical Learning Theory, Convex Optimization, Numerical Linear Algebra, Probability Theory, Graph Theory, Information Theory, Signals & Systems Foundations.
- **Research & Technical Documentation:** LaTeX, PowerBI, Visio, Technical Writing for Peer-Reviewed Publications, Reproducible Experimentation, Data Annotation & Curation.

Certificates

- **Machine Learning Specialization:** Stanford University
- **CS50:** Harvard University
- **Financial Markets:** Yale University
- **Finance & Quantitative Modeling for Analysts:** University of Pennsylvania

Volunteering and Leadership

- **Director of Membership Development:** IET YP SLN
- **Chairman:** IET on Campus SLTMNIT
- **Sri Lankan Delegate:** Future Tech Congress 2024 Bangalore India
- **Secretary:** UH Students Council
- **Leader:** University Band
- **Toastmaster and Rotoracter:** University Chapter

References

Eng. Dr. Naleen Jayasooriya
Lecturer | Chief People Officer, Sri Lanka Telecom PLC
Email: naleen@slt.com.lk | Phone: +94 71 429 1238

Eng. Dr. Tilani Gunewardena
Senior Lecturer | Engineer ML & DS, Sri Lanka Telecom PLC
Email: tilani@slt.com.lk | Phone: +94 71 970 1468