

Jaliya Nimantha

Electronic and Telecommunication Engineering Undergraduate

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SUMMARY

Final year Electronic and Telecommunication Engineering undergraduate at the University of Moratuwa with research experience at the Augmented Human Lab, National University of Singapore. Skilled in deep learning, edge AI deployment, and multi-agent systems, with hands-on work in TinyML, Vision-Language Models, and LLM optimization for resource-constrained devices. Currently focused on Brain-Computer Interfaces, assistive technologies for the visually impaired, controllable LLM generation, and Human-Computer Interaction research. Passionate about building interpretable, human-centered AI systems that bridge cutting-edge algorithms with real-world engineering impact.

WORK EXPERIENCE

Augmented Human Lab - National University of Singapore

Remote

Research Attachment

Aug 2024 – Dec 2024

- Worked on fine-tuning Vision-Language Models (VLMs) for textbook-based contextual understanding, enhancing educational accessibility for visually impaired individuals in the Singaporean education system.
- Focused on optimizing multi-modal learning pipelines and developing an agentic framework for autonomous interaction.
- Contributed to model optimization and deployment at Magentic One, ensuring scalable real-world applications.

Augmented Human Lab - National University of Singapore

On-site

Research Engineer Intern

Dec 2024 – June 2025

- Developed and deployed machine learning models on edge devices using TinyML and MediaPipe, enabling real-time on-device inference with minimal computational resources.
- Successfully implemented large language models (LLMs) on low-power devices without GPU acceleration using the llama.cpp framework.
- Worked with LangGraph to develop an agentic framework for structured, autonomous interaction in multi-agent systems.

EDUCATION

University of Moratuwa

Moratuwa, Sri Lanka

B.Sc. Engineering (Hons.) in Electronic and Telecommunication Engineering

March 2022 – Present

- **CGPA:** 3.61/4.00
- **Dean's List:** Semester 1, Semester 6
- **Core Modules:** Deep Learning for Vision, Neural Networks and Fuzzy Logic, Pattern Recognition, Linear Algebra, Image Processing and Machine Vision, Data Structures and Algorithms, Introduction to Engineering Optimization, Applied Statistics, Digital Signal Processing, Robot Design and Competition

Bandaranayake College

Gampaha, Sri Lanka

GCE Advanced Level - Physical Science Stream

Jan 2011 – Aug 2019

- Z-Score: **2.3605** (3 A's) | Island Rank: **287**

PROJECTS

GGUF Converter for Hugging Face* 🌐

Dec 2024

Python CLI tool automating the full pipeline for converting Hugging Face LLaMA models to GGUF format for llama.cpp.

- Quantization with precision options (Q4_0, Q5_1, TQ1_0) and upload to Hugging Face Hub.
- Full automation via CLI or Python API with build, convert, and server commands.

AiSee LLaMa Android SDK* 🌐

Dec 2024

Android SDK enabling on-device LLaMA inference with Hugging Face model search and GGUF model loading.

- Load .gguf models from URI with dynamic system prompts and LiveData responses.
- JitPack integration for easy Android app deployment with partial response callbacks.

(* Research collaboration projects with AiSee and Augmented Human Lab)

Fusion of Speech and EEG signals for neural speech tracking (Final Year Project) 🔗 *Ongoing*

Investigating neural speech tracking by fusing EEG signals with speech features for improved brain-computer interface applications.

- Signal processing pipelines for EEG-speech feature extraction and alignment.
- Deep learning models to decode speech-related neural activity patterns.

BioSense-AI 🔗 *Aug 2023*

A portable health monitoring device with advanced ECG technology for precise diagnostics, connected to a mobile app for real-time health insights.

- Machine learning models to accurately classify conditions like asthma and heart failure.
- Integration of simultaneous ECG and PPG signals for improved health predictions.

Campus-Yamu 🔗 *Aug 2024*

AI-powered platform simplifying university selection for Sri Lankan students by analyzing Z-scores, districts, and preferences using RAG models.

- LangChain and OpenAI integration providing personalized recommendations from UGC Handbook.
- Filters 300+ degree programs in seconds, guiding 200,000+ school leavers annually.

Hodi (Sinhala OCR Project) 🔗 *Ongoing*

Deep learning-based OCR system designed to recognize both handwritten and printed Sinhala characters, enabling digital preservation of documents.

- CNN-based character recognition model trained on custom Sinhala dataset.
- Mobile and web integration for document scanning and text extraction.

TumorVision (Brain Tumor Detection) 🔗 *April 2024*

Cutting-edge web application using PyTorch deep learning to analyze MRI scans and detect brain tumors with Flutter frontend and Flask backend.

- Multi-class classification: glioma, meningioma, pituitary tumors, or no tumor detected.
- Python/PyTorch model with OpenCV image processing; Flask-ngrok backend communication.

GOYAMA (Rice Disease Prediction) 🔗 *June 2024*

PyTorch deep learning model achieving 98% accuracy in identifying rice leaf diseases, helping farmers detect crop infections early.

- Detects Bacterial blight, Blast, Brown spot, and Tungro from leaf photos.
- Transfer learning with VGG architecture and Albumentations data augmentation.

Vehicle Detection (YOLOv8) 🔗 *June 2024*

Dashboard camera vehicle detection using YOLOv8 and KITTI dataset, addressing Sri Lanka's 35,000+ annual traffic accidents through AI-powered monitoring.

- Real-time detection with bounding boxes for vehicle tracking and speed estimation.
- Foundation for ADAS and traffic monitoring to reduce Sri Lankan road fatalities.

Deep Learning with PyTorch: Image Segmentation 🔗 *May 2024*

Coursera guided project implementing U-Net architecture for semantic segmentation, labeling each pixel for autonomous driving scene understanding.

- TensorFlow/Keras U-Net trained on CARLA self-driving car dataset.
- Pixel-perfect segmentation masks for road, vehicles, and pedestrians.

Industrial End Effector 🔗 *May 2024*

Custom-designed vacuum gripper end effector with integrated ToF sensors for automated pick-and-place operations in industrial robotics.

- VL53L0X Time-of-Flight sensors measuring box yaw and pitch angles.
- Modbus RS485 communication with custom PCB and 3D-printed enclosure.

Line-following PID Robot (InnovaBot) 🔗 *Nov 2023*

Autonomous robot with PID control for precise line-following, featuring obstacle avoidance and sound-responsive navigation challenges.

- Arduino-based control with IR line sensors and ultrasonic proximity sensing.
- Competition-ready design with dynamic guard robot evasion capabilities.

NutriTech Pot 🔗 *Aug 2023*

IoT-enabled smart plant pot with automated watering system, featuring soil moisture monitoring and mobile app connectivity for remote care.

- Atmega328p microcontroller with capacitive moisture sensor and DC pump.
- NutriTech companion app for real-time plant health monitoring and alerts.

SKILLS

Languages: English (professional), Sinhala (native)
Programming: Python, C++, Java, Matlab, Kotlin
Data Science/AI: Numpy, Pandas, PyTorch, Tensorflow
Software/Design: Altium Designer (PCB), Android Studio, Xcode, Photoshop, Illustrator, Premiere Pro
Frameworks: NodeRED, LangGraph
Other: Version Control (Git), L^AT_EX

AWARDS AND SCHOLARSHIPS

Semi-Finalists - Meta Llama Incubator Programme* <i>Meta AI</i> (* Research collaboration project with AiSee and Augmented Human Lab)	2025
Finalist - Brainstorm 2024 Competition <i>IEEE EMBS Students Chapter, UOM</i>	2024
Finalist and Best Pitch - ICE 2024 <i>Entrepreneurship Hackathon</i>	2024
3rd Place - MECHA 2023 Competition <i>Faculty of Medicine, UOC</i>	2023
President Scout Award <i>Highest rank in Sri Lanka Scout Association</i>	2019

LEADERSHIP EXPERIENCE

Electronic Club, University of Moratuwa <i>Vice President (2025 – Present) Head of Operations (2024 – 2025)</i> <ul style="list-style-type: none">– Led student engagement activities, department outreach programs, CSR events, fundraising initiatives, and student representation in administrative matters.	2023 – Present
EXMO 2023 - University of Moratuwa <i>Department Facilitator</i> <ul style="list-style-type: none">– Contributed to the execution of the flagship engineering exhibition.	Jul 2023
Rotaract Club, University of Moratuwa <i>Committee Member</i> <ul style="list-style-type: none">– Organized events and worked as video editor for Data Storm, El Talento, and Rota Spark.	Dec 2022
Scout Troop, Bandaranayake College <i>Troop Leader</i> <ul style="list-style-type: none">– Led a troop of over 600 scouts, organizing national-level events including an all-island hiking competition with multiple championship wins.– Played key role in centenary celebration projects; awarded President Scout Award for outstanding leadership and community service.	2018

REFERENCES

Dr. Ranga Rodrigo Senior Lecturer Dept. of Electronic & Telecom Engineering University of Moratuwa Email: ranga@uom.lk Tel: +94 11 264 0422	Prof. Suranga Nanayakkara Associate Professor Vice-Dean, Communications Director, CHILL PI, Smart Systems Institute AI+HCI Lead, NUS+CNRS IPAL Lab Email: suranga@ahlab.org
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