# Jaliya Nimantha

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## Education

- **University of Moratuwa** *Moratuwa, Sri Lanka*
  ***B.Sc. Engineering (Hons.) in Electronic and Telecommunication Engineering*** March 2022 - Present
  – ***CGPA:*** *3.55/4.00*
  – ***Dean's list:*** *Semester 1, Semester 6*
- **Bandaranayake College** @ *Gampaha, Sri Lanka*
  *GCE Advanced Level - Physical Science Stream; Z-Score* ***2.3605*** *(**3 A's**)* ***Ranked 287*** *(**all island**)* Jan 2011 - Aug 2019

## Projects @

- **Fusion of Speech and EEG signals for neural speech tracking - (Finale Year Project)** @ *Ongoing*
  –BioSense-AI is a portable health monitoring device with advanced ECG technology for precise diagnostics, connected to a mobile app for real-time health insights. It uses machine learning to accurately classify conditions like asthma and heart failure, with plans to integrate simultaneous ECG and PPG signals for improved health predictions.
- **BioSense - AI** @ *Aug 2023*
  –BioSense-AI is a portable health monitoring device with advanced ECG technology for precise diagnostics, connected to a mobile app for real-time health insights. It uses machine learning to accurately classify conditions like asthma and heart failure, with plans to integrate simultaneous ECG and PPG signals for improved health predictions.
- **Campus - Yamu** @ *Aug 2024*
  –**Campus Yamu** is an AI-powered web application designed to help Sri Lankan students discover suitable university degree programs based on their Z-scores, district, and preferences. By leveraging Retrieval-Augmented Generation (RAG) models, LangChain, and OpenAI, the platform delivers personalized recommendations from the UGC Handbook. The project aims to simplify the university selection process, providing tailored guidance to over 200,000 school leavers annually.
- **Semi-supervised Contrastive Learning for Facial Expression Recognition** @ *Oct 2024*
  –Developed an unsupervised learning-based facial expression recognition model capable of classifying 8 expression classes. Designed to enhance robustness and generalization, leveraging multi-modal features for improved performance in real-world scenarios. Explored its implementation as part of the MV-MR project to integrate advanced machine vision techniques.
- **Hodi (Sinhala OCR Project)** @ *Ongoing*
  –Hodi is an app we're currently developing. It uses OCR technology to identify both handwritten and printed Sinhala letters, which can be utilized for various purposes.
- **NextWordPredictor (NLP Project)** @ *Ongoing*
  –Developed a next-word prediction model using TensorFlow and Keras with LSTM neural networks, focusing on text preprocessing, tokenization, and training on a text corpus. Ongoing efforts aim to optimize the model for improved accuracy and explore larger datasets.
- **TumorVision (Brain Tumor Detection Web Application)** @ *April 2024*
  –TumorVision is a web application designed to swiftly and accurately detect brain tumors using deep learning algorithms. It identifies glioma tumors, meningioma tumors, pituitary tumors, or confirms the absence of any tumor. TumorVision is currently in the development stage with a prototype showcasing 60-70% accuracy.

- **GOYAMA (Rice Disease Prediction Model) @** *June 2024*
  - –GOYAMA, a PyTorch-based deep learning model, identifies rice leaf diseases (Bacterial blight, Blast, Brown spot, Tungro) from photos with around 98% accuracy on test and validation sets. Trained on Kaggle's Rice Leaf Dataset.
- **Vehicle Detection Project using YOLOv8 and KITTI Dataset @** *June 2024*
  - –Led a vehicle detection project using YOLOv8 and the KITTI dataset to improve road safety with real-time monitoring and speed detection. Future goals include enhancing the model to detect vehicle directions and developing an advanced driver-assistance system (ADAS) for proactive traffic management.
- **Wearable Real-Time Sign Language Recognition System with EMG and IMU Sensors @** *Ongoing*
  - –Developing a wearable device for real-time hand sign recognition using sEMG and IMU sensors. The system aims to detect muscle activity and hand movements, converting sign language gestures into audible speech through a deep learning model. The goal is to create an affordable, portable solution to bridge communication between hearing and deaf individuals.
- **Deep Learning with PyTorch : Image Segmentation, *Coursera Project Network* @** *May 2024*
  - –Implemented a U-Net architecture in TensorFlow and Keras for precise semantic image segmentation of objects in the CARLA self-driving car dataset, achieving significant accuracy improvements through model construction and training.
- **Industrial End Effector @** *May 2024*
  - –Developed an industrial end effector with a vacuum gripper for automated pick and place robots. The system integrates four ToF sensors for precise box yaw and pitch angle measurement, using Modbus protocol over USB for seamless communication with robot control panels.
- **Line-following obstacle-avoiding PID controlled robot @** *Nov 2023*
  - –Designed and implemented a robotic system capable of following lines and avoiding obstacles using a PID control algorithm.
  - –Utilized Arduino platform, infrared line sensor, and ultrasonic obstacle sensor to achieve accurate navigation
- **NutriTech - Pot @** *Aug 2023*
  - –The NutriTech Pot is a smart plant care system that automatically waters plants based on soil moisture levels. It connects to the NutriTech app, allowing users to monitor and manage their plants remotely.

## Experience

- **Reseacrh Attachment - Augmented Human Lab (Remote)** *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. Additionally, contributed to model optimization and deployment at Magentic One, ensuring scalable real-world applications.
- **Reseacrh Engineer Intern - Augmented Human Lab** *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, optimizing models for efficient performance in resource-constrained environments.
  - –Worked with LangGraph to develop an agentic framework for structured, autonomous interaction in multi-agent systems.

## Awards and Scholarships

- **Finalists Brainstorm 2024 Competition, organized by the IEEE EMBS Students Chapter, UOM**
  *Brainstorm 2024, Biomedical Engineering Competition* 2024
- **Finalists and the Best pitch**
  *ICE 2024, Entrepreneurship Hackathon* 2024
- **3$^{rd}$ place MECHA 2023 Competition, organized by the Faculty of Medicine, UOC**
  *Mecha 2023 Medical Device Hackathon, hosted by the Department of Medical Technology* 2023
- **Mahapola Higher Education (Merit) Scholarship**
  *For outstanding performance in GCE A/L Examination. Ranked **15** (**district**)* 2021
- **School Colours Award**
  *Exceptional academic achievements,President Scout award, and service as a troop leader within the Scout group* *2019*
- **President Scout Award**
  *The highest rank in the Sri Lanka Scout Association. (as a scout)* *2019*

## Skills Summary

**Languages:** English (professional proficiency), Sinhala (native proficiency)
**Programming Languages:** Python, C++, Java, Matlab, Kotlin
**Data Science and Analysis Tools:** Numpy, Panadas, PyTorch ,Tensorflow
**Software:** Enclosure designing (Beginner level) ,PCB Designing (Altium Designer) ,Mobile App Development (Android Studio, Xcode)
**Frameworks:** NodeRED (Beginner level), Langraph
**Sports:** Swimming, Cricket
**Video Editing :** Premire Pro, After Effects
**Graphic Designing:** Photoshop, Adobe Illustrator

## Community and Leadership

- **EXMO 2023 - University of Moratuwa** *Department Facilitator*
  Jul 2023

  –Contributed to the successful execution of the University of Moratuwa's flagship engineering exhibition, showcasing innovative student projects and promoting technological awareness.

- **Electronic Club, University of Moratuwa** *Vice President - Main Branch*
  Present

  –Led the organization of key student events such as Abhina, Shuttle Fest, Tronic Awurudu, Industry Envoyage, and the Career Fair. Also contributed to community initiatives like SLRC and E-Care, fostering both academic enrichment and social responsibility.

- **Rotract Club, University of Moratuwa** *Commitee Member*
  Dec 2022

  –I've been involved in organizing several events with the Rotaract Club of the University of Moratuwa. Additionally, I've worked as a video editor for events such as Data Storm, El Talento, and Rota Spark.

- **Scout Troop, Bandaranayake College** *Troop Leader*
  2018

  –Led a troop of over 600 scouts, organizing national-level events including an all-island hiking competition with multiple championship wins. Played a key role in centenary celebration projects and was awarded the President Scout Award, the highest honor from the Sri Lanka Scout Association, for outstanding leadership and community service.

## References

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