Naveen Sanjaya Basnayake

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Education

University of Moratuwa B.Sc. Engineering (Hons.) in Electronic and Telecommunication Engineering

Moratuwa, Sri Lanka March 2023 - Present

- o CGPA: 3.84/4.00
- Coursework: Image Processing and Machine Vision, Pattern Recognition, Signals and Systems, Electronic Circuits and Analysis, Electronic Circuit Design, Applied Statistics

Dharmaraja College

Kandy, Sri Lanka Jan 2013 – Sep 2022

- o **Z-score** 2.484; **District** Rank 11th; **Island** Rank 164th
- o Coursework: Combined Mathematics, Physics, Chemistry

Udacity AWS Machine Learning Fundamentals

Online June 2024

 Coursework: Convolutional Neural Networks (CNN), Deep Neural Networks (DNN), AWS SageMaker, AWS Lambda, Transfer Learning

 ${\bf Coursera}\ \textit{Google}\ \textit{Project}\ \textit{Management}\ \textit{Certification}$

Online Dec 2022

 Coursework: Project Management, Risk Management, Proficient in work management software and digital tools

Achievements

Dean's List 2022, 2024

Semesters - 1, 2, 4

Finalist | Sri Lanka AI Challenge

2024

Awarded by IEEE Challenge Sphere - Developed a web app with an LLM Chatbot, Manifesto Comparator, and Win Predictor for election analysis

Finalist | IEEE IES Generative AI Challenge 2025

2025

By IEEE Industrial Electronics Society - cktFormer: Developed a Transformer-Based generative AI model for Automated Analog Circuit Design

Mahapola Higher Education (Merit) Scholarship

2022

For outstanding performance in the GCE A/L Examination. Ranked 168 out of 200000+ students

Publications

cktFormer: Transformer-Based Approach for Automated Analog Circuit Design

2025 (Accepted)

Accepted to *IECON 2025* under the track "The Responsible Practice of Generative Artificial Intelligence for Industrial Applications and Systems."

Projects

ckt Former: Transformer-Based Automated Analog Circuit Design — Py-Torch, L
Tspice $\,$

Jan 2025

- Designed a dual-transformer architecture for analog circuit synthesis, achieving 89.6% validity and outperforming cktGNN and AnalogGenie.
- Trained on the AnalogGenie dataset (3,351 circuits) using PyTorch; optimized for component and connection

prediction (F1: 0.856).

SpectraNet: FFT-Assisted Deep Learning for Deepfake Detection — PyTorch, EfficientNet-B6, FFT 🗘 🗹

Jan 2025

- Fine-tuned EfficientNet-B6 for deepfake detection, achieving 91.02% accuracy.
- Used FFT-based phase and amplitude features to enhance representation, enabling high accuracy with minimal preprocessing.
- Applied mixed-precision training (PyTorch AMP), AdamW, and ReduceLROnPlateau to reduce evaluation time to 2.55 sec/image for near real-time use.

LibriBrain: MEG-based Speech Decoding (Ongoing) — Python, MEG

Ongoing

 Competing in NeurIPS 2025 brain-computer interface challenge to decode speech/silence and classify phonemes from MEG recordings.

RightVote: AI-Powered Election Analysis Platform — Python, LSTM, RAG, Gemini, Flutter 🗘 🗹

Jan 2025

- Developed an AI-powered election platform with an RAG chatbot (Gemini-1.5, HuggingFace) for manifesto comparison and an LSTM-based win predictor using poll data and Twitter sentiment.
- o Built with LangChain, Chroma, and Firebase and deployed as a Flutter web app.

MediBox: Embedded IoT System for Smart Medicine Management — ESP32, Node-RED, MQTT protocol 🗘 🗹

May 2025

- Designed an embedded IoT system to monitor temperature, humidity, and light, with real-time visualization through a Node-RED dashboard.
- Enabled remote control through MQTT, including servo thresholds and alarm scheduling, with PID-inspired logic for automated medicine dispensing.

Analog Computer Design Using Operational Amplifiers — LTspice, Altium Designer, PCB Design ♥ ☑

Dec 2024

- Designed and simulated a fully functional analog computer capable of addition, subtraction, multiplication, integration, and differentiation using op-amp circuits (e.g., Gilbert cell multipliers).
- Developed PCB layouts in Altium Designer, optimizing component placement for signal integrity.

Wireless Communication System Using Software-Defined Radio (SDR) — GNU Radio, BladeRF, BPSK/QPSK ♥ ☑

Dec 2024

• Designed a point-to-point digital wireless communication system using BladeRF 2.0 SDRs to transmit images, voice, and video in the 2.4 GHz ISM band while adhering to power regulations.

HiveLink: Embedded IoT System for Smart BeeHive Management — ESP32, Flutter, FireBase

Sep 2023

- \circ Designed a non-invasive beehive monitoring system using Atmega microcontrollers and DHT22 sensors to track temperature (± 0.5 °C), humidity ($\pm 2\%$ RH), and population trends via IR sensors
- Developed a user-friendly web application that visualizes hive health trends and sends alerts for any anomalies.

AMR Safety System — VisualSlam, SolidWorks, Altium 🕠 🗹

Ongoing

• Developing an autonomous mobile robot with a depth camera for obstacle detection and avoidance algorithms in C++ for industrial payload transport.

Skills Summary

Languages: English, Sinhala (native)

Programming Languages: Python, Java, JavaScript, C++, SQL

Software and Tools: PCB Designing (Altium), Enclosure Designing (Solidworks), Blender, Unity, Electronic

Simulation (LTSpice), MATLAB

Frameworks: PyTorch, scikit-learn, Next.js

Cloud & DevOps: AWS SageMaker, Git, Linux

Documentation: Microsoft Office Suite, Google Workspace, LaTeX

Soft Skills: Project Management, Teamwork, Leadership

Social Engagements

Event Media Lead - Sri Lanka Robotics Challenge 2025

March 2025

Coordinated teams to manage videography, live coverage, and post-event media releases

Field Representative - University of Moratuwa

March 2023 - Sep 2023

Served as a student representative for Semesters 1 Actively participating in initiatives and promoting effective communication between students and faculty

Career Fair - Department of ENTC

Jan 2025

Handled company coordination and outreach for event sponsorships Conducted cold calling campaigns and maintained communication with corporate partners to secure financial and logistical support

Research Interests

Computer Vision, Machine Learning, Augmented & Virtual Reality (Human-Computer Interaction), Generative AI, Intelligent Systems

References

Dr. Chamira U. S. Edussooriya

B.Sc.Eng. (Moratuwa) M.A.Sc., Ph.D. (UVic), MIEEE,

Senior Lecturer,

Department of Electronic and Telecommunication Engineering,

University of Moratuwa, Sri Lanka.

Dr. Sampath K. Perera

B.Sc. Eng. (Moratuwa, Sri Lanka), M.E.Sc (Western, Canada), P.hD. (RUB, Germany), MIEEE,

Senior Lecturer,

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