Rivindu Vinsara Kumarage

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Professional Summary

Electronic & Telecommunication Engineering undergraduate passionate about solving complex problems through innovative hardware and software. Skilled in machine learning, software development and computer vision, with a focus on creating impactful, end-to-end solutions in robotics and IoT.

Education

University of Moratuwa — **Moratuwa, Sri Lanka**
Bachelor of Science in Electronic & Telecommunication Engineering, Current GPA: 3.71/4.00 — *2022–2027*
- **Relevant Coursework:** Digital & Analog Electronics, Control Systems, Digital & Analog Signal Processing, Communication Systems, Circuit Analysis & Design, Electromagnetics, Robotics, Data Structures & Algorithms, IoT, Pattern Recognition, Image Processing & Computer Vision, Embedded Systems, Linear Algebra, Calculus

ESOFT — **Sri Lanka**
Level 3 Diploma in IT & Diploma in English, Both completed with Distinction — *2022–2023*
- **Modules:** Computer Hardware, Web Design & CSS, Graphics and Multimedia, Databases with SQL, C#

Nalanda College — **Colombo 10, Sri Lanka**
G.C.E. Advanced Level, Z Score: 2.26 — *2013–2022(Jan)*
- **Results:** Combined Mathematics (A), Physics (A), Chemistry (A), General English (A)

Technical Skills

Languages: **Proficient:** C, C++, Python, MATLAB — **Familiar:** Verilog, VHDL, C#, JavaScript, TypeScript

Frameworks & Libraries: TensorFlow, PyTorch, OpenCV, Flask, React, Eel, Arduino Framework, STM32 HAL

Dev Tools: **IDEs:** VS Code, STM32CubeIDE, Keil μVision5, PlatformIO — **Simulation & EDA:** LTspice, Multisim, Altium Designer

IoT & Cloud: MQTT, Node-RED, SQLite, REST APIs, WebSocket

Areas of Expertise: Robotics, IoT, ML, DSA, Computer Vision, Pattern Recognition, Image Processing, Circuit Design

Key Projects

Echo-Guard – Smart Noise Mapping UI
ESP32, Raspberry Pi, MQTT, React
Implemented the user interface for a noise monitoring system (Echo-Guard) using ESP32 nodes and a Raspberry Pi server, with MQTT→WebSocket data streaming and a React dashboard for real-time map visualization and alerts.

ParkSense – IoT Smart Parking Assistant
IoT, Computer Vision (LPR), MQTT, ML
Designed an end-to-end parking system with ultrasonic/IR occupancy sensing on Arduino/Raspberry Pi, LPR-based automated entry/exit, a real-time spot-allocation dashboard, and ML-driven demand prediction.

Strain-Gauge–Based Torque Sensor
Analog Front-End, BLE, Data Visualization, Circuitry Test & Calibration
Implemented the user interface for a wireless strain gauge torque sensor with BLE data streaming, real-time torque visualization, configurable display settings, and historical trend review.

PathoAssist – Real-Time Microscope Image Analysis
FastAPI, React, OpenCV, TypeScript, Tailwind
Built a full-stack application for live microscope video capture and modular overlay pipelines, enabling cell counting, fluorescence detection, and interactive parameter control with real-time data visualization.

Micromouse (Current)
STM32F411, IMU & Encoders, Flood-Fill
Designed and programmed an STM32F411-based micromouse implementing flood-fill maze solving, IR and IMU sensor fusion, encoder-based motion control and adaptive speed profiles.

PixieBot – Manipulation & Sorting Robot
4-DOF Arm, Encoders, PID Control
Developed modular control software for an autonomous robot with a 4-DOF robotic arm, encoder-based PID navigation, and color-based object classification with automated storage.

Autonomous Multi-Function Robot
ATmega2560, C++, PID, IR/Ultrasonic
Programmed an autonomous robot with dual IR arrays, triple PID control, and a state machine; completed 5/8 navigation/manipulation tasks.

PiGuard – Smart Security Camera
Raspberry Pi, OpenCV, Flask, Telegram API
Developed an intelligent security camera with PIR motion detection, IR night vision, automatic video recording, web dashboard, and Telegram integration for instant video alerts.

Smart MediBox – Dual-Mode Medicine Reminder
ESP32, MQTT, Node-RED, OLED UI
Built a medicine reminder system with two modes: a local OLED/buzzer alarm with NTP-synced scheduling and environmental monitoring, and an IoT mode with MQTT→Node-RED dashboard, remote parameter control, and light-based servo automation.

AmpAware – Smart Plug Base
Altium Designer, LTspice, ESP32/ESP8266, 13A Relay
Led circuit & PCB design (power stage, relay driver, protection); LTspice-simulated and Altium-implemented for an IoT smart plug (Blynk, OTA).

Analog Voltmeter – EN2091 Project
Op-Amp Design, PCB, Enclosure
Designed and fabricated a 3-range analog voltmeter using op-amp amplification, overvoltage protection circuits, and a custom PCB/enclosure, validated through Proteus simulation and bench testing.

Awards & Competitions

SLRC Finalist-4th place (Pixie-bot), 2025, University Category
Advanced to final round of Sri Lanka Robot Challenge 2025.

Brainstorm Finalist-4th place (PathoAssist), 2025
Selected as finalist in inter-university innovation competition.

SPARK Challenge Finalist-6th place (Echo-Guard), 2025
Recognized for presenting an innovative, sustainable, and socially conscious solution.

SLIoT – Semi-finals (ParkSense), 2025, University Category
Recognized for developing an IoT-based smart parking assignment system.

Leadership & Activities

Professional: **IEEE Student Member** - Active participation in technical workshops and seminars

Leadership: **E-Club Committee Member** - Organized inter-university competitions

Sports: **Taekwondo and Swimming** - Swimming (school), Taekwondo team member UoM (Green Belt. 7th GUP)

Additional Competencies

Languages: **English** (Fluent), **Sinhala** (Native)

Soft Skills: **Team Leadership, Project Management, Problem Solving, Technical Documentation**

Certifications: **Arduino Programming Certificate, MATLAB Fundamentals Certificate, Machine Learning Specialization (Coursera - Stanford University)**

References

Dr. Upeka Premaratne
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