Rishmika Wijewardhana

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RishWijewardhena — rishmika-wijewardhana

About Me!

Dedicated and highly motivated undergraduate student pursuing a BSc (Hons) in Electronic and Information Technology at the University of Colombo, with a strong academic foundation in statistics, physics, applied mathematics, and computer science. Currently deepening expertise in embedded systems, machine learning, and web application development, with a particular focus on IoT and edge computing solutions. Passionate about designing intelligent, low-latency systems that bring machine learning models closer to the data source, enabling real-time decision-making on resource-constrained devices. Enthusiastic about applying these skills to domains such as underwater robotics and autonomous systems, and driven by a commitment to innovation, analytical thinking, and solving complex real-world problems through technology.

Education

University of Colombo *2022 – Present*
BSc (Hons) in Electronic and Information Technology
GPA: 3.7 / 4.0

Ananda College Colombo *2017 – 2020*
GCE Advanced Level: Chemistry (A), Physics (B), Mathematics (C)
GCE Ordinary Level: 9 A's

Experience

Student Mentor (Level 2) *2025 – Present*
I2C Lecture

RoboticGen, Colombo

- Mentored students in robotics, embedded systems, and electronics projects, emphasizing practical learning and hands-on experience.
- Conducted learning sessions on I2C communication and other embedded protocols to enhance students' hardware interfacing skills.
- Organized and guided students in online and physical competitions focused on embedded systems and AI projects.
- Supported workshops and practical sessions for peer learning, project development, and prototype testing.

Data Processor *Sep 2021 – May 2022*
Waquiz, Colombo

- Performed data collection, cleaning, and analysis to support informed business decisions.
- Created and maintained structured databases and spreadsheets to improve data accessibility and reporting efficiency.

Projects

Underwater Robot for Temperature and Salinity Monitoring GitHub **Project Demo**

- Developed a tethered underwater ROV using Raspberry Pi 4 for real-time navigation, live video streaming, and temperature monitoring.
- Implemented motor control using four brushless DC motors with ESCs for 3D movement and torque-balanced propulsion.
- Built a PyQt-based GUI hosted on the Raspberry Pi for live video feedback, data visualization, and remote control via Ethernet (RealVNC).
- Integrated waterproof temperature sensors for environmental monitoring with automated CSV data logging.
- Achieved stable operation during pool tests with accurate sensing, smooth navigation, and full waterproofing.

PereaBot Competition – Wall Following Robot GitHub

- Designed and implemented an ESP32-based autonomous wall-following robot with a multi-sensor system and parallel processing.
- Integrated VL53L0X ToF distance sensors for 360° obstacle detection using an I2C multiplexer (TCA9548A).
- Added TCS34725 color sensor for color-based navigation and MPU6050 gyroscope/accelerometer for orientation and stability control.
- Successfully simulated the robot in Webots and built the physical robot to complete the final round of the PereaBot competition.

ESP32 High-Temperature MQTT Monitoring Device GitHub

- Developed an ESP32-based temperature monitoring system capable of measuring up to 300°C and publishing real-time data to an MQTT server.
- Implemented Wi-Fi provisioning through Access Point (AP) mode) with a built-in web interface for easy credential setup.
- Added a NeoPixel LED status indicator for network connectivity, MQTT communication, and system states.
- Integrated a backup battery system to ensure uninterrupted operation during power loss.
- Designed and fabricated the custom PCB, and created a robust enclosure for housing the complete device.

Micromouse Robot – Maze Navigation GitHub **Project Demo**

- Designed and implemented a micromouse robot capable of autonomous maze navigation.
- Developed parallel processing routines on the ESP32 for simultaneous sensor fusion and motor control.
- Built a custom 2-layer PCB for compact integration of ToF sensors, IMU, motor drivers, and encoders.

Wearable Smartwatch for Biometric Monitoring GitHub

- Built on ATmega32 microcontroller with sensors for heart rate and temperature monitoring.
- Used Embedded C and bare-metal programming for low-power, real-time health tracking.

Voice-Activated Emergency Alert System GitHub

- Designed a voice-controlled IoT safety device using Arduino Nano 33 BLE and GSM SIM900 for offline emergency alerts.
- Integrated an Edge Impulse-trained ML model for real-time voice recognition of the phrase “Help Me”.
- Enabled automatic SMS notifications to predefined contacts without requiring an internet connection.
- Developed a compact, portable system architecture combining embedded AI and GSM-based communication.

Predicting Liver Cirrhosis Outcomes with Deep Neural Network GitHub

- Preprocessed the dataset by removing duplicates, handling missing values, applying one-hot encoding to categorical features, and standardizing numerical inputs.
- Developed a Deep Neural Network (DNN) using Keras and TensorFlow to predict patient prognosis from clinical and biochemical data.
- Achieved 92% accuracy and a weighted F1-score of 0.92 through early stopping, dropout regularization, and a stratified train–test split.

University Attendance System GitHub

- Built a web system using CodeIgniter and mobile app in React to scan university ID barcodes for attendance.
- Included admin dashboard, real-time updates, and secure student database integration.

Medicare System Mobile App GitHub

- Developed Android app to manage medical appointments, patient history, and secure communication.
- Enabled patient-doctor interaction and document upload/view access.

Pet Rescue Web Application GitHub

- Web application with Admin/User/Guest dashboards for managing pet adoptions.
- Included secure login, pet status updates, and user-request workflows.

Skills

- **Embedded Electronics:** Microcontroller Programming (AVR, ARM, ESP32), PLC Programming with Ladder Implementation, PCB Design, Power Electronics
- **Programming:** C, C++, Java, Python, PHP, JavaScript
- **AI/ML:** TensorFlow, Scikit-learn, XGBoost, Model Tuning, Feature Engineering
- **Digital Design:** System Verilog, FPGA (intel Quartus), Simulation (ModelSim)
- **Web/Mobile Dev:** HTML, CSS, React, CodeIgniter, Android Studio
- **Tools:** Git, Octave, Arduino, EasyEDA, Proteus,onshape

Certificates

- Supervised Machine Learning (Coursera, Jul 2024)
- Artificial Intelligence in Embedded System (University of Moratuwa) Certificate
- Fundamentals of Digital System Design (University of Moratuwa, 32 hours) Certificate
- Verilog for ASIC/FPGA Design & Simulation '25 (University of Moratuwa, 60 hours) Certificate

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Competitions

- **Perabots Finals** – Selected as a finalist for the national robotics competition.
- **Robofest 2025** – Achieved 14th place out of 70+ registered competitors.

Community and Leadership

President, Electronics and Robotics Club, University of Colombo *2025 – Present*
Chief Organizer, Project Akura
Contributed stationery to support children in need. [Project Link]

Languages

- English (Fluent)
- Sinhala (Fluent)

Sports

- Swimming
- Chess

References

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