Sahan Lelwala

Computer Engineer

 Kandy, Sri Lanka   +94 76 967 8634   sahanrashmikaslk@gmail.com   sahanrashmikaslk.github.io
 https://www.linkedin.com/in/sahan-lelwala/   https://github.com/sahanrashmikaslk

Summary

A final year Computer Engineering student at University of Ruhuna with expertise in embedded systems, IoT monitoring, robotics„ IC design, and full-stack development. During my Magicbit internship, I mastered embedded firmware programming for solar energy monitoring systems with IoT platforms and edge computing. I excel in bridging hardware and software domains, from low-level FPGA programming to cloud microservices. Furthermore, as an innovator, I actively engaged in IEEE activities, from organizing workshops to participating in technical events and committed to leveraging technology for positive change.

Education

Kingswood College, Kandy, SL   2019 A/L

BSc. in Computer Engineering, University of Ruhuna, SL   2021 to present
SGPA (current) : 3.34 / 4.00
Key Coursework: Digital logic design, Data Structures and Algorithms, Hardware Description Languages, IC design, Robotics and Automation, Machine Learning, Full stack Development, Advanced AI, High Performance Computing

Experience

Embedded System Intern at Magicbit (Pvt) Ltd, Colombo, SL   Jul. 2024 to Dec. 2024 (6 months)

During my six-month industrial training as an Embedded system intern, I was fully integrated into the development team, contributing significantly to the design, implementation, and deployment of industrial IoT solutions. My core responsibilities centered on the end-to-end development of IoT monitoring and control systems using IOT platforms. Key projects included the Windforce Kebithigollawa Solar Plant and the multi-plant MAS Thulhiriya Rooftop Solar projects. https://sahanrashmikaslk.github.io

Volunteering Experience

Technical Team Lead - IoTrix 2025 (IoT Design Competition),
IEEE Student Branch UOR   Jun 2025 – Oct 2025 (4 months)
Led the technical development of IoTrix 2025, the flagship Internet of Things (IoT) event hosted by the IEEE Communications Society at the University of Ruhuna. This initiative fosters innovation and hands-on learning in IoT among students and professionals.

Logistics Team Lead - SparkLink 1.0 (Electronic Design Competition)
IEEE Student Branch, UOR   Jun 2023 – Sep 2023 (4 months)
Oversaw all aspects of event coordination for SparkLink 1.0, the first Electronic Design Competition organized by IEEE Student Branch Ruhuna.

Technical Skills

Languages: Python, TypeScript/JavaScript, C/C++, C#, Java, CUDA, VHDL/Verilog

Web & Backend: React, Node.js/Express, FastAPI, Spring Boot, REST APIs, JWT/Auth

Cloud & DevOps: GCP (Compute Engine, Cloud Run, Cloud SQL), Docker, Kubernetes/GKE, Nginx, GitHub Actions (CI/CD)

AI/ML & CV/DSP: PyTorch, TensorFlow, scikit-learn, YOLOv8, OpenCV, EasyOCR/Tesseract, librosa (MFCC/FFT)

IoT & Embedded: Raspberry Pi, Arduino/ESP8266, MQTT, ThingsBoard, sensors & edge deployment

Robotics & Automation: MATLAB/Simulink, PLC Programming (Ladder Logic), Industrial Automation

Achievements & Awards

Eminence 4.0 (2024) — Champions, inter-university technical competition (IoT, electronics, networking).

Red Cypher CTF (2024) — 2nd Runners-up, cybersecurity challenge among 40+ teams.

HaXtream 2.0 (2023) — 7th place, competitive programming (dynamic programming focus).

XBotiX (2023) — 6th place, robotics competition (line-following, wall-following, color detection).

Projects

NeoCare - Smart Neonatal Incubator Monitoring & Recommendation System   *FYP / Edge AI & IoT*

End-to-end edge–cloud system for neonatal incubator monitoring and decision support. Runs on Raspberry Pi 4B+ with on-device ML (jaundice detection, cry detection & classification, LCD reading) and an NTE rule engine for safe temperature recommendations. Publishes telemetry via MQTT to ThingsBoard CE and a GCP-hosted backend (VM + Cloud Run/Cloud SQL) with role-based web dashboards (clinical/admin/parent) and a Flutter NICU mobile app. Secure remote live video streaming is provided through Tailscale VPN and an Nginx reverse proxy. https://github.com/sahanrashmikaslk/incubator_monitoring_with_thingsboard_integration

Baby Cry Detection & Classification   *FYP / ML*

Real-time edge computing system on Raspberry Pi with two-stage ML pipeline: YAMNet detection (97.8% accuracy) + Ensemble classification (93% accuracy) into 5 cry types. Features FFT-based audio analysis (300-2000 Hz), automatic recording with resampling (48kHz→16kHz), FastAPI service, and MQTT integration for real-time telemetry. https://github.com/sahanrashmikaslk/Cry-Detection-Classification-Model

Neonatal Jaundice Detection System   *FYP / Deep Learning*

Dual-head multi-task learning with MobileNetV3 for jaundice detection and quality assessment. Achieved 93% accuracy, 97.6% specificity, ROC AUC 97.4%. Includes ONNX export and edge running. https://github.com/sahanrashmikaslk/Neonatal_jaundice_detection

Neonatal Incubator Display Reader   *FYP/ Computer Vision*

YOLOv8 + EasyOCR pipeline for automated reading of incubator displays. Precision 99.4%, Recall 99.2%, mAP@0.5: 99.3%. Real-time validation with data logging. https://github.com/sahanrashmikaslk/Neonatal_incubator_displayReader

AINet - AI-Powered Network Anomaly Detection   *AI / Networking*

Enterprise-grade anomaly detection with LangChain/LangGraph, FastAPI backend, real-time dashboards, and distributed Linux agents. https://github.com/sahanrashmikaslk/AI_Network_Analysis

Online Medicine Delivery System   *Cloud / Microservices*

Microservices-based platform on GCP with RabbitMQ, Redis, PostgreSQL, Google OAuth, CI/CD, and load balancing. https://github.com/sahanrashmikaslk/online-medicine-delivery

Gene Expression Correlation (OpenMP & CUDA)   *High Performance Computing*

Accelerated Pearson correlation on large gene datasets using hybrid OpenMP–CUDA (up to $6\times$ speedup). https://github.com/sahanrashmikaslk/GeneExpressionData-CorrelationMatrixComputing-UsingOpenMP-CUDA

32-Bit RISC Processor   *Hardware / HDL*

Designed and simulated a 32-bit RISC processor with 15 core instructions using Verilog & ModelSim. https://github.com/sahanrashmikaslk/HDL-32bit_RISC_Processor

Classical Music Generator   *AI / Deep Learning*

LSTM-based model trained on MusicNet for real-time classical music generation https://github.com/sahanrashmikaslk/AI-ClassicalMusicGenerator

Flight Delay Prediction   *Machine Learning*

Built predictive models (SVM 93%, KNN 88%) on 500K+ U.S. flight records with feature engineering & validation. https://github.com/sahanrashmikaslk/MachineLerning-FlightDelayPrediction

Pet Adoption Web Application (MERN)   *Web Development*

A pet adoption site built using MERN. Features: user auth, CRUD, image upload, search filters, responsive UI with neumorphic design. https://github.com/sahanrashmikaslk/MERN-PetAdoptionWebApplication

Smart Home Security System (NodeMCU, Telegram)   *IoT / Hardware*

Built for Eminence 4.0 competition: motion sensors + ESP8266 NodeMCU + Telegram API integration for alerts; remote monitoring & control. https://github.com/sahanrashmikaslk/SmartHomeSecuritySystem-Using_NodeMCU

BJT Amplifier Using Proteus with PCB Implementation   *Electronics*

Designed common-emitter BJT amplifier in Proteus; transferred design onto PCB; targeted gain and bandwidth performance met. https://github.com/sahanrashmikaslk/BJT_Amplifier-Using_Proteus

References

Dr. Rajitha Udawalpola: Senior Lecturer, Dept. of Electrical and Information Engineering, FOE, UOR
Phone: +94 718 578 608 | Email: rajitha@eie.ruh.ac.lk

Dr. Nadeesha Sandamali: Senior Lecturer, Dept. of Electrical and Information Engineering, FOE, UOR
Phone: +94 912 245 765 | Email: nadeesha@eie.ruh.ac.lk