YASANTHA NIROSHANA

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Research Interests

Embedded Machine Learning (TinyML), Neuromorphic Computing, Hardware-Software Co-design, and Resource-constrained Neural Network Optimization.

Education

University of Moratuwa Aug 2022 – 2026
B.Sc. (Hons) in Engineering, Computer Science and Engineering *Moratuwa, Sri Lanka*

- CGPA: **3.73/4.00**
- Specialization: **Integrated Computer Engineering**
- Minor: **Pattern Recognition**
- **Selected Coursework:** Pattern Recognition, Machine Vision, Deep Learning for Vision, Introduction to Engineering Optimization, Convex Engineering Design, Machine Intelligence, Image Processing, Embedded Systems and Applications, Robotics and Automation, Embedded Software Engineering, IoT Devices and Applications

Mahinda College 2007 – 2020
GCE Advanced Level (Physical Science Stream) *Galle, Sri Lanka*

- Z-Score: **2.562** | Island Rank: **115** | Result: **3A's**

Publications

Niroshana, **Yasantha**, Weijith Wimalasiri, and Chathuranga Hettiarachchi. "Patient-Aware Contrastive Learning Preserves Per-Patient Structure in RR-Interval Representations". In: *GlobalSouthML: Bridging Gaps for Underrepresented Researchers in Machine Learning, ICML 2026 Workshop*. arXiv:2606.23570. May 2026. arXiv: 2606.23570. URL: https://arxiv.org/abs/2606.23570.

Niroshana, **Y.**, S. Sooriyaarachchi, and I. Gunarathne. *Bee Acoustic Dataset with Environmental Parameters*. Accessed: Apr. 26, 2026. Apr. 2026. DOI: 10.5281/zenodo.19739013. URL: https://doi.org/10.5281/zenodo.19739013.

Niroshana, **H.**, W. Wimalasiri, and C. Hettiarachchi. "Peak detection of PPG signals using fixed-point digital filters implemented in VHDL". In: *Proceedings of the ERU Symposium 2025, Engineering Research Unit, University of Moratuwa*. Accessed: May 01, 2026. Jan. 2025, pp. 80–81. DOI: 10.31705/ERU.2025.38. URL: https://dl.lib.uom.lk/items/73c999d1-3082-4812-94ae-30e70bf6d68a.

Kodisinghe, R., **Y. Niroshana**, and W. Wimalasiri. "A Smart mask for wireless, real-time monitoring of CO2 and humidity". In: *Proceedings of the ERU Symposium 2025, Engineering Research Unit, University of Moratuwa*. Accessed: Apr. 26, 2026. Jan. 2025. DOI: 10.31705/ERU.2025.6. URL: https://dl.lib.uom.lk/items/6d7048aa-743f-470d-b7a8-65941aa91edb.

Research & Technical Projects

NPU-Accelerated Heat Index Prediction | ***Embedded ML*** | ***[GitHub]*** 2025

- Developed an end-to-end pipeline to predict Heat Index using a Luckfox Pico NPU. Designed and trained a model using **Quantization-Aware Training (QAT)**, and deployed the quantized **(INT8)** model.
- Analyzed inference throughput and memory access patterns on the **NPU** while maintaining high regression accuracy.

Predicting AFib at Edge (Ongoing) | ***Embedded ML*** | ***[GitHub]*** 2025

- Advisor: Dr. Chathuranga Hettiarachchi
- Researched lightweight CNN architectures for real-time AFib prediction from PPG sensors. Focusing on model pruning and temporal feature extraction to enable continuous monitoring on wearable devices.

IntelliBee: Acoustic TinyML for Beehive Monitoring | ***IoT, DSP*** | ***[GitHub]*** 2024

- Designed a resource-efficient acoustic monitoring system to detect swarming via **Linear Predictive Coding (LPC) coefficients**. Leveraged statistical variance of coefficients as features to replace high-compute FFT/spectrogram methods.

IoT-Air Quality Monitor | ***Embedded Systems*** | ***[GitHub]*** 2024

- Advisor: Dr. Kutila Gunasekara
- Engineered a low-power sensor node integrating TVOC, dust, and particulate matter sensors. Optimized data logging intervals and transmission protocols for long-term outdoor deployment.

8-Bit Custom NanoProcessor Synthesis | ***Computer Architecture, VHDL*** | ***[GitHub]*** 2023

- Designed and synthesized a custom 8-bit processor. Implemented an ALU and a custom instruction set capable of being executed on a Basys3 FPGA.

Experience

University of Moratuwa 2026 – Present
Research Assistant *Moratuwa, Sri Lanka*

- Research in predictive monitoring — machine learning for physiological signals under tight resource budgets.

University of Moratuwa Jul 2025 – Present
Teaching Assistant *Moratuwa, Sri Lanka*

- CS3631 - Deep Neural Networks | CS4363 - Hardware Description Languages
- Previously: CS3283 - Embedded Systems Project | CS3340 - Robotics and Automation

Ackcio Dec 2024 – May 2025
Embedded Software Engineer Intern *Remote*

- Optimized diagnostic tool for industrial sub-GHz wireless mesh networks. Analyzed network congestion patterns to improve reliability in high-interference geotechnical environments.

RoboticGen May 2023 – Present
Lead Software Engineer (Part-time) *Colombo, Sri Lanka*

- Leading the Edu-Tech software development team, focusing on developing software for a STEM learning.

Certifications

Embedded Software Essentials Specialization | University of Colorado Boulder (via Coursera) 2024

- Introduction to Embedded Systems Software | Embedded Software and Hardware Architecture

TinyML Professional Certificate | Harvard University (via edX) 2024

- Fundamentals of TinyML

Embedded Machine Learning | Edge Impulse 2024

- Introduction to Embedded ML | Computer Vision with Embedded Machine Learning.

Awards & Honours

Winner | Evolve IoT Research Competition (University of Kelaniya) Oct 2024

- IoT-based smart helmet system using the Thread protocol for the mining industry.

Second Runner Up | Bashaway | SLIIT FOSS Community Oct 2024

- National-level Linux scripting competition focused on system administration and open-source workflows.

Second Runner Up | Brainstorm | IEEE EMBS, University of Moratuwa Jul 2024

- AI-based physiotherapy assistant that provides real-time feedback and personalized exercise programs.

Bronze Medal | All Island Mathematics Competition (Ministry of Education) Oct 2019

Invited Talks & Sessions

Introduction to IoT | SLIoT 2025, University of Moratuwa Feb 2025

MoraForesight 1.0 & 2.0: Getting Started with IoT/Robotics 2023 – 2024

Introduction to Arduino Programming | Kickstart to Robotics, IEEE Techverse SL Sep 2022

Leadership & Volunteer Activities

SLIOT Challenge Oct 2023 – Apr 2024
Lead - Selection Committee *University of Moratuwa*

- Led a team in evaluating 200+ industry-scale IoT projects for 700+ contestants, ensuring technical rigor.

MoraXtreme 8.0 Sep 2023 – Oct 2023
Academic Excellence Committee *University of Moratuwa*

- Coordinated algorithmic problem set development for undergraduates preparing for IEEEXtreme.

References

Prof. Chandana Gamage
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Dr. Kutila Gunasekera
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