

# Kanishka Gunawardana

Department of Computer Engineering, University of Peradeniya, Sri Lanka

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[github.com/KATTA-00](https://github.com/KATTA-00) | [scholar.google.com/citations](https://scholar.google.com/citations)

## Profile

A motivated and passionate fresh Computer Engineering graduate with keen interests in Computer Architecture, Embedded Systems, Neuromorphic Computing, Computer Vision, and Intelligent Systems. Committed to leveraging advanced technologies to address real-world challenges, with proven leadership skills and a strong collaborative mindset.

## Education

### University Of Peradeniya

Nov. 2021 – Present

*Undergraduate in B.Sc. Engineering(Hons.) Computer Engineering*

**Current GPA: 4.0/4.0**

Field Rank: **1/90**

### Dharmaraja College Kandy

Nov. 2006 – Aug. 2019

*G.C.E. Advanced Level Examination*

**Z-score: 2.5661**

National Rank - **149/19508**, District Rank - **11/1189**

## Experience

### Temporary Instructor

Aug. 2025 – Present

*Department of Computer Engineering, University of Peradeniya*

Instructing courses in computer architecture and embedded systems, conducting labs and evaluations. Engaged with the PeraMorphIQ Neuromorphic Research Group on neuromorphic accelerator research and development, mentoring teams on on-chip learning and power optimisations. Additionally mentoring architecture project groups at the ESCAL Lab.

### Software Engineering Intern

Jul. 2024 – Dec. 2024

*WSO2 LLC, Colombo, Sri Lanka*

Developed Ballerina integrations, including the OpenAI Finetunes Connector. Worked on ISO20022-to-SwiftMT message conversion using Ballerina for financial message interoperability, along with SaaS-based app design and development.

## Publications

### Optimized Multi-Processor System-on-Chip (MPSoC) Design for Low-Resource JPEG Encoding

*K.H. Gunawardana, R.A.J.C. Adhikari, I. Nawinne*

- Proposed a pipelined MPSoC for efficient JPEG encoding to improve throughput, utilizing Altera Nios II/e processors on a Cyclone IV FPGA, enhanced with custom instructions, custom FIFO queues, and superscalars.
- Presented at: ICAC 2024, Published in: IEEE Xplore

## Undergraduate Research Thesis

### **SNAP-V: A RISC-V SoC with Configurable Neuromorphic Acceleration for Small-Scale**

**Spiking Neural Networks (Final Year Thesis)** | *Group* | [Thesis PDF](#)

Nov. 2024 – Jul. 2025







- Designing and developing a neuromorphic SoC for small-scale SNNs, featuring a configurable neuromorphic accelerator with on-chip learning, tailored for low-power edge applications such as robotics and IoT applications.
- Integrating RISC-V-based general-purpose computing and sensor interfacing capabilities like to support embedded tasks alongside SNN execution, addressing bottlenecks of conventional neuromorphic architectures.
- Supervision: Dr. Isuru Nawinne, Prof. Roshan G. Ragel
- Technology: **RISC-V, Chisel, Chipyard, Verilog-HDL, Synopsys VCS/PrimePower, Vivado**

## Selected Projects

### **RV32IM Pipeline Processor** | *Group* | [GitHub](#)

Dec. 2024 – Present

- Implemented a 5-stage pipelined RISC-V RV32IM processor with in-order hazard handling, explored AXI-based memory integration for SoC compatibility, performed power analysis using Synopsys PrimePower for optimization, automated the power analysis using a GitHub Actions CI/CD workflow, and prototyped the design on an FPGA.
- Technology: **Verilog HDL, Synopsys DC, VCS, PrimePower, Icarus Verilog, GTKWave, GitHub**

- Impact Tracking System for Athletes (3YP)** | Group |   Nov. 2023 – Mar. 2024
- Built a real-time head impact monitoring system for contact sports using wearable devices and desktop applications to aid concussion detection, post-session syncing, and player safety analytics.
  - Contributions: Led hardware and firmware design and development of wearable devices, developed the centralized hub and local communication, contributed to backend API, and deployed the system on AWS EC2.
  - Technologies: **Arduino, Raspberry Pi, MQTT, Python, Express.js, MongoDB, AWS**
- Field-Based Approach for Quantifying Plant Leaf Color** | Group |   Aug. 2023 – Nov. 2023
- Developed a mobile application with a backend that utilizes Image Processing and Computer Vision to objectively quantify plant leaf colour by analyzing information extracted from captured leaf images.
  - Contributions: Developed the backend API for image analysis using FastAPI and contributed to image preprocessing, including image segmentation with a Mask R-CNN model fine-tuned for leaf segmentation.
  - Technology: **Python, OpenCV, Pytorch, FastAPI, Flutter**
- Obstacle Robot Swarm for Swarm Robotic Project** | Group |   Feb. 2024 - Nov. 2023
- Led the development and firmware updates of obstacle-avoiding robots equipped with navigation and collision avoidance algorithms, utilizing a gyroscope and accelerometer for the swarm robotics platform.
  - Integrating obstacle robots with the existing swarm platform, enabling studies of dynamic obstacle scenarios.
  - Technology: **Arduino, Python, Java, MQTT, OpenCV**

## Achievements

- SLIoT Challenge 2023** | *Sri Lankan Biggest IOT Competition* | Team: IMPAX Mar. 2024
- 1st runners-up (Out of 100+ Teams) | *Organized by UOM in collaboration with SLT-MOBITEL and IESL*
- MoraXtream 8.0** | *12 hour algorithmic programming competition* | Team: Five4Five Nov. 2023
- National Rank - 4 (Out of 400+ Teams) | *Organized by the IEEE Student Branch of the University of Moratuwa*
- IEEE Xtreme 17.0** | *24 hour algorithmic programming competition* | Team: Five4Five Nov. 2023
- Global Rank - 374 (Out of 16500+ participants), National Rank - 24 (Out of 330 Teams)
- ACES Coders v10.0** | *12 hour algorithmic programming competition* | Team: Five4Five Oct. 2023
- National Rank - 12 (Out of 350+ participants) | *Organized by the ACES*

## Selected Certificates

- Machine Learning Specialization - Stanford University & DeepLearning.AI(Coursera) Sep. 2023
- Supervised Machine Learning: Regression and Classification
  - Unsupervised Learning, Recommenders, Reinforcement Learning
  - Advanced Learning Algorithms

## Technical Skills

**Languages:** Python, C/C++, Java, SQL, JavaScript, Verilog HDL, ARM Assembly, Ballerina, TypeScript  
**Frameworks:** Arduino, Express.js, Spring Boot, FastAPI, Node.js, React.js  
**Libraries:** OpenCV, NumPy, Matplotlib, Pandas, PyTorch, TensorFlow  
**Developer Tools:** Git, Docker, AWS, Quartus II, NIOS II, GTKWave, Vivado  
**EDA Tools:** Synopsys Design Compiler, VCS, PrimeTime, PrimePower

## Extra-Curricular Activities

- Volunteering Project Nenathambara - University of Peradeniya Sep. 2023 - Jul. 2024
- Head of Web Development - Robotics Society, University of Peradeniya Sep. 2023 - Aug. 2024
- Executive Committee Member - Robotics Society, University of Peradeniya Dec. 2022 - Sep. 2023
- Member of Rotaract Club of University of Peradeniya Dec. 2021 - Dec. 2023

## References

- Dr. Isuru Nawinne** | [isurunawinne@eng.pdn.ac.lk](mailto:isurunawinne@eng.pdn.ac.lk)  
 Senior Lecturer, Department of Computer Engineering, Faculty of Engineering, University of Peradeniya, Sri Lanka.
- Prof. Roshan G. Ragel** | [roshanr@eng.pdn.ac.lk](mailto:roshanr@eng.pdn.ac.lk)  
 Professor, Department of Computer Engineering, Faculty of Engineering, University of Peradeniya, Sri Lanka.