

Kanishka Gunawardana

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github.com/KATTA-00 | 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**

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](#)

Experience

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.

Undergraduate Teaching Assistant

Jun. 2022 – Present

Department of Computer Engineering, University of Peradeniya

Computing (GP106), Programming Methodology (CO222), Third Year Project (CO300) - Assisted in labs, quizzes, and course materials, supporting students in Python, C programming, and project mentoring.

Selected Projects

A RISC-V SoC with Configurable Neuromorphic Acceleration for Small-Scale

Spiking Neural Networks (FYP) | Group | [🔗](#) [📄](#)







Nov. 2024 – Present

- 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.
- Integrating RISC-V-based general-purpose computing and sensor interfacing capabilities to support embedded tasks alongside SNN execution, addressing bottlenecks of conventional architectures.
- Supervision: Dr. Isuru Nawinne, Prof. Roshan G. Ragel
- Technology: **RISC-V, Verilog-HDL, Synopsys Tools, FPGA, Cyclone IV, Quartus II**

RV32IM Pipeline Processor | Group | [🔗](#) [📄](#)

Dec. 2024 – Present

- Designing and implementing a CPU supporting the RISC-V 32IM instruction set architecture with a 5-stage pipelined design, focusing on high efficiency and accurate instruction execution.
- Technology: **Verilog HDL, Icarus Verilog, GTKWave, Synopsys DC, Synopsys VCS**

- 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 dashboards to aid concussion detection, post-session syncing, and player safety analytics.
 - Contributions: Led hardware and firmware design for wearables, developed the centralized hub and local network, contributed to backend APIs, and deployed the system on AWS.
 - 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 using FastAPI and contributed to image preprocessing, including segmentation using deep learning techniques (Mask R-CNN).
 - Technology: **Python, OpenCV, Pytorch, FastAPI, Flutter**
- Obstacle Robot Swarm for Swarm Robotic Project** | *Group* |   Feb. 2024 - Nov. 2023
- Led the development and firmware update of obstacle robots with navigation and collision avoidance algorithms 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*
- IEEEExtreme 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
EDA Tools: Synopsys Design Compiler, VCS, PrimeTime, PrimePower

Extra-Curricular Activities

- Project Nenathambara - Department of Computer Engineering, 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

Prof. Roshan G. Ragel | roshanr@eng.pdn.ac.lk

Professor, Department of Computer Engineering, Faculty of Engineering, University of Peradeniya, Sri Lanka.

Dr. Isuru Nawinne | isurunawinne@eng.pdn.ac.lk

Senior Lecturer, Department of Computer Engineering, Faculty of Engineering, University of Peradeniya, Sri Lanka.