

Kanishka Gunawardana

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Profile

I am an enthusiastic 3rd year Computer Engineering undergraduate with a fervent interest in Computer Architecture, Embedded Systems, Computer Vision, and Machine Learning. Driven by a passion for leveraging cutting-edge technology to tackle complex challenges and create impactful solutions.

Education

University Of Peradeniya

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

Field Rank: **1/90**

Nov. 2021 – Present

Current GPA: 4.0/4.0

Dharmaraja College Kandy

G.C.E. Advanced Level Examination

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

Nov. 2006 – Aug. 2019

Z-score: 2.5661

Experience

Undergraduate Teaching Assistant

Department of Computer Engineering, University of Peradeniya

GP106: Computing, CO222: Programming Methodology - Supervised 2hr long weekly lab sessions based on Python and C programming languages. Assisted in quiz creation and lab material preparation and designing course projects.

Jun. 2022 – Present

Volunteering

Project Nenathambara - University of Peradeniya

Led University of Peradeniya's outreach program for Project Nenathambara, organizing workshops on Arduino and robotics for underprivileged students in Sri Lankan schools.

Sep. 2023 – Present

Selected Projects

Impact Tracking System For Athletes | Group | 🌐🌐

Nov. 2023 – Mar. 2024

- Developed a real-time head impact monitoring system for contact sports using wearable devices and dashboards with integrated backend and secure database, enabling prompt concussion identification, post-session data transmission, and comprehensive analytics for player safety and informed decision-making.
- Contributions: Designed and developed wearable device hardware and firmware, established the centralized hub and local area network, contributed to backend API development, and handled deployment on AWS infrastructure.
- Technology: **Arduino, Raspberry PI, MQTT, Python, Express.js, MongoDB, AWS**

A 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 with Mask R-CNN, to achieve accurate quantification of plant leaf color.
- Techniques: Image Segmentation using Mask R-CNN, Colour Extraction, K-mean Clustering
- Technology: **Python, OpenCV, Pytorch, FastAPI, Flutter**

Obstacle Robot Swarm for Swarm Robotic Project | Group | 🌐🌐



Feb. 2024 – Present

- Leading the development and firmware update of obstacle robots with 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**

8-bit Single-cycle Processor | Group | 🌐

Mar. 2023 – Jun 2023

- Designed and implemented an 8-bit single-cycle processor architecture in Verilog HDL to emulate a MIPS inspired ISA, enabling functionality for arithmetic, logic, data transfer, and control flow operations.
- Built a comprehensive testbench for verification, ensuring processor functionality and timing constraints.
- Technology: **Verilog-HDL, GTKWave**

- Sri Lankan Export-Grade Mango Fruit Identification** | Group | Mar. 2024 – Present
- Developing a computer vision system to grade the quality and maturity level of Sri Lankan export-grade mangoes by isolating mango images from background.
 - Incorporating both traditional image processing techniques and advanced deep learning approaches for segmentation and classification.
 - Techniques: Image Segmentation, Contouring, Spatial and Frequency domain filtering
 - Technology: **Python, OpenCV, TensorFlow**
- Department Space Management System** | Group |   Mar. 2023 – Jun. 2023
- Developed a web application using Spring Boot and React for efficient reservation management of shared spaces in a university department, including waiting list functionality and user hierarchy for access control.
 - Contributions: Developed the backend API using Spring Boot and integrated MySQL database for efficient data management and retrieval.
 - Technology: **Java, Spring Boot, React.js, MySQL**

Achievements

- SLIoT Challenge 2023** | *Sri Lankan Biggest IOT Competition* | Team: IMPAX Mar. 2024
- 2nd Runners up(Out of 100+ Teams) | *Organized by University of Moratuwa 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 Association of Computer Engineering Students of the University of Peradeniya*
- ACES PreCoders v10.0** | *6 hour algorithmic programming competition* | Team: Five4Five Sep. 2023
- University Rank - 2(Out of 50+ Teams)
- ACES Hackathon 2023** | *An inter-university hackathon organized by the ACES* | Team: LearnLink Sep. 2023
- LearnLink - An innovative online marketplace for buying and selling books

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
- Engineering Drawing and 3D Modelling using AutoCAD Mar. 2021

Technical Skills

Languages: Python, C/C++, Java, SQL, JavaScript, Verilog HDL, ARM assembly
Frameworks: Arduino, Express.js, Spring Boot, FastAPI
Libraries: OpenCV, NumPy, Matplotlib, Pandas, Pytorch, TensorFlow
Developer Tools: Git, Docker, Quartus, GTKWave, AWS

Extra-Curricular Activities

- Head of Web Development - Robotics Society - University of Peradeniya Sep. 2023 - Present
- Executive Committee Member - Robotics Society - University of Peradeniya Dec. 2022 - Sep. 2023
- Member of Rotaract Club of University of Peradeniya Dec. 2021 - Present

References

- Prof. Roshan G. Ragel** | roshanr@eng.pdn.ac.lk
 Head of Department, 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.