

AKILA KARUNANAYAKE

Department of Computer Engineering, University of Peradeniya, Sri Lanka 20400

+94 77-45216548 ✉ e17154@eng.pdn.ac.lk [linkedin.com/in/Akila](https://www.linkedin.com/in/Akila) <https://github.com/Akilax0>

Interests

- Embedded Systems
- Computer Architecture
- Machine Automation
- Computer Vision

Education

University of Peradeniya

Nov. 2018 – Present

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

GPA 3.80/4.00

Trinity College Kandy

Jan. 2004 – August 2017

G.C.E. Advanced Level Examination

District Rank - 59, National Rank - 831

Relevant Coursework

- Embedded Systems
- Compilers
- Software Methodology
- Operating Systems
- Computer Architecture
- Data Structures
- Algorithms
- Image Processing

Experience

STERNX | <https://www.sternxengineering.com/>

May 2020 – Present

Junior Software Engineer

- Developed front end for the company depicting the services and blog posts of the employees.
- Utilized Javascript frameworks, HTML, CSS to allow updates on external sites to be displayed on the relevant site .

Department of Computer Engineering

Spring 2020 – Present

Volunteer Developer and Maintainer

- Development and maintenance of the following department sites.
 - * <https://projects.ce.pdn.ac.lk/ongoing-projects/>
- Project Coordinator for 40+ undergraduates working on different development projects.

Projects

Autonomous Landmine Detector | C++, Python, AWS, Selenium

Jun 2021 - Present

- Developed an autonomous bot controlled by an ESP32 to scan a given area for landmines using electro-magnetic methods and display results on a webapp.
- Created a back-end using AWS services to store parameters used in each turn and its results.
- Technologies: ESPIDF, MQTT, I2C, SPI .
- Github : <https://github.com/cepdnaclk/e17-3yp-Landmine-Detector>
- Autonomous Path Planning
 - * Implementation of path finding algorithms for autonomous navigation.
 - * Github: <https://github.com/Akilax0/Autonomous-Path-Planning>

Multi-Processor System-on-Chip(MPSoC) | FPGA, C

Feb 2022

- Used FPGA design tools to create MPSoc with shared memory to share data between the processors.
- Extended communication to dedicated hardware FIFO queue for better performance.
- Github : https://github.com/Akilax0/FPGA_CO503/tree/main/Lab3

CRC using customized NiosII processor | FPGA, C

Feb 2022

- Improved performance of Cyclic-Redundancy-Check algorithm by adding a custom instruction to the MIPS ISA of NiosII processor.
- Implementation of hardware functionality using XOR and shift operations.
- Github : https://github.com/Akilax0/FPGA_CO503/tree/main/Lab2

Smart Building | Automation, IoT

Oct 2022

- Project lead for a group of 60 undergraduates.
- Design and prototype implementation of the system.
- Technologies: MQTT, NodeRED, Docker, Arduino.
- Github : <https://github.com/cepdnaclk/e17-co326-Smart-Building>

Analysis Tool for Industrial Images <i>OpenCV, Automation</i>	Feb 2022 - Present
<ul style="list-style-type: none"> • Created a tool to analyze performance of an image processing algorithm used to detect deformities in an industrial molding machine. • Dashboard and API was created to visualize the results. • Technologies: OpenCV, React, ExpressJS, WebSocket. • Github : https://github.com/cepdnaclk/e17-co328-Analysis-Tool-for-Industrial-Images 	
Compiler for Cool Language <i>COOL, C++</i>	Feb 2022
<ul style="list-style-type: none"> • The combination of a lexer, parser, semantic analyser, and code generator that can be used to compile programs written in Cool programming language. • Github : https://github.com/Akilax0/assignments 	
Vehicle Number Plate Analyzer <i>Image Processing, OCR</i>	Feb 2022
<ul style="list-style-type: none"> • Created Tool to analyze CCTV captured images and recognize number plates of vehicles. • Classical image processing techniques were used to remove noise and scale the raw images such as super resolution, histogram analysis, Fourier domain analysis. • Optical character recognition used to extract information from the resulting images. • Report: https://drive.google.com/file/d/14ejy8Z_6T3mxUF3Oj9dBymhuGgTtWvGL/view?usp=sharing 	
8-bit processor <i>Verilog, ARM assembly</i>	October 2020
<ul style="list-style-type: none"> • Designed 8-bit ALU with a register file for memory using Verilog. • Simulated processor behaviour using Icarus Verilog and input and output signals were observed using GTKWave. • Tested behaviour using ARM assembly code. • Github : https://github.com/Akilax0/FPGA_CO503/tree/main/CO224 	
Fractal generator <i>Java</i>	October 2020
<ul style="list-style-type: none"> • A tool to display Mandelbrot and Julia sets, for given parameters. • Use of multi-threading concepts in generating the images. • Github : https://github.com/Akilax0/Fractal-Generator 	
Image Processing techniques to detect damaged fruit <i>Python, OpenCV</i>	November 2019
<ul style="list-style-type: none"> • Image Filtering with OpenCV was used to create an algorithm to detect the deformities of fruit . • Created application using python to continuously monitor given set of images . 	

Competitions

1st and 2nd Runner up of MoraXtreme 6.0 and 7.0 respectively (of 200+ teams) <i>12 hour competitive programming competition for university undergraduates in Sri Lanka.</i>	Oct.2021/22
185th and 142nd world rank of IEEEExtreme 15.0 and 16.0 respectively <i>24 hour competitive programming competition for university undergraduates worldwide.(out of 6000+ teams)</i>	Oct.2021/22
5th place at IESL UIY <i>Undergraduate innovator of the Year competition organized by IESL for undergraduates of Sri Lanka</i>	2021
Jaffna Coders Competitive Programming Competition <i>Entered the Final 20 teams out of 100+ teams</i>	2019
Top 20 country rank of Google Code Jam, ACES Coders	2019-2022

Certificates and Courses

Classical Cryptosystems and Core Concepts — University of Colarado System	May.2020
Introduction to CyberSecurity Tools & Cyber Attacks— IBM	May.2020

Technical Skills

Languages	C++,C,Verilog HDL,Python,Java, HTML/CSS, JavaScript
Developer Tools	ESP-IDF, Quartus, AWS, Android Studio
Technologies/Frameworks	Linux, GitHub, Jekyll

Extracurricular

Teaching Git & Github Fundamentals with Hackers' Club for all undergraduates **2021**

Workshop to introduce basic developer skills

- Slides: https://drive.google.com/drive/folders/18zGvksfkHTUNqcctLs4e_blR5jXdUOgL?usp=sharing

Member of the Web Consultation team of University of Peradeniya **2021- Present**

Group focused on improving university's digital presence

Swarm Robotics group **2021- Present**

Documentation of the existing project

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