

AKILA KARUNANAYAKE

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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 3.71/4.00

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/>
 - * <https://people.ce.pdn.ac.lk/>
 - * <https://cepdnack.github.io/>
 - * <https://url.ce.pdn.ac.lk/>
 - * <https://faq.ce.pdn.ac.lk/>
- Project Coordinator for 40+ undergraduates working on different development projects.

Projects

Vehicle Number Plate Analyzer | *Image Processing, OCR*

Feb 2022

- 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

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

Compiler for Cool Language | *COOL, C++*

Feb 2022

- 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>

Analysis Tool for Industrial Images <i>Open CV , 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 	
Autonomous Landmine Detector <i>Selenium, C++, AWS</i>	Jun 2021 - Present
<ul style="list-style-type: none"> 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 <ul style="list-style-type: none"> Implementation of path finding algorithms for autonomous navigation. Github: https://github.com/Akilax0/Autonomous-Path-Planning 	
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 	
Hospital Management System <i>HTML, CSS, SQL</i>	September 2020
<ul style="list-style-type: none"> Created a website to show the availability of doctors and appointment reservation for the patients. Github : https://github.com/Akilax0/CO226-Project-Hospital_db 	
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 Runner up of MoraXtreme 6.0 (of 180+ teams)	Oct.2021
<i>12 hour competitive programming competition for university undergraduates in Sri Lanka.</i>	
208th world rank of IEEEExtreme 15.0 (of 5500+ global teams)	Oct.2021
<i>24 hour competitive programming competition for university undergraduates worldwide.</i>	
5th place at IESL UIY	2021
<i>Undergraduate innnovator of the Year competition organized by IESL for undergraduates of Sri Lanka</i>	
Jaffna Coders Competitive Programming Competition	2019
<i>Entered the Final 20 teams out of 100+ teams</i>	
Top 20 country rank of Google Code Jam, Hash Code, Kick Start, ACES Coders	2019-2020

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: Python, C++, C, HTML/CSS, JavaScript, Verilog HDL

Developer Tools: ESP-IDF, AWS, Android Studio

Technologies/Frameworks: Linux, GitHub, Jekyll, FPGA

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_bIR5jXdUOgL?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

<https://people.ce.pdn.ac.lk/staff/academic/roshan-ragel/>

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