

IMESH BALASURIYA

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Profile

A third year Computer Engineering undergraduate with a passion for problem solving and software development, and a strong interest in Computer Architecture and Computer Vision.

Education

University of Peradeniya, Sri Lanka

Nov 2018 – Present

BSc. Engineering(Hons.) Computer Engineering (Reading)

Current GPA: 3.70/4.00

Ananda College, Colombo - 10

2017

G.C.E. Advanced Level Examination

Combined Mathematics (A), Physics (B), Chemistry (B)

Projects

QuickPark – E-Parking System | *Node, Express, MongoDB, React/React Native, Python, AWS*

2021 – Present

Group | [[Project Page](#), [GitHub Repo](#)]

- A fully-automated parking system that automatically identifies vehicles, assigns parking spots to them and allows reservation of parking spots for a seamless parking experience.
- Created a web-based management portal for the car park owners and a mobile app for the car park users.
- Designed two hardware field units for vehicle identification and parking spot allocation that communicate with the backend hosted on AWS via MQTT.
- **Contribution:** Proposing the project, Management portal (Frontend), Mobile app, Spot assignment algorithm using Python, MQTT communication using AWS IoT Core, Hardware designs for on-premise units, Unit testing

Analytical Software for Next Generation Skim Sequencing Data | *Java, Maven, JavaFX*

2022 – Present

Group | [[Project Page](#), [GitHub Repo](#)]

- Created a standalone desktop application for analysis of Chloroplast, Mitochondria and ITS region NGS data.
- Implemented existing pipelines using several CLI tools and bundled them together to form a single GUI package.
- **Contribution:** Set-up of pipelines, UI design, Command-line tool integration

Reconstruction of Highly-Degraded License Plate Images | *Python, OpenCV, Tesseract-OCR*

2022

Group

- Demonstrated the effectiveness of traditional image processing techniques in the reconstruction of low-resolution license plate images obtained from CCTV footage.
- Applied standard techniques to get rid of various degradations such as noise and motion blur and upscaling techniques to improve the resolution of the images.
- **Techniques:** EDSR upscaling, Fourier domain analysis, Degradation modelling (De-blur and De-noise), OCR

Compiler for COOL Language | *C++, Flex, Bison*

2022

Group | [[GitHub Repo](#)]

- Implemented a 4-stage compiler for the COOL programming language comprising of a lexical analyzer, parser, semantic analyzer, and a code generator that generates MIPS assembly code.
- **Techniques:** Finite State Machines, Abstract Syntax Trees, Regular Expressions, Context-Free Grammars

8-bit Single Cycle Processor | *Verilog HDL*

2020

Group

- Designed an 8-bit single cycle processor with a MIPS-style instruction set including an ALU, a register file and control logic.
- Designed a memory architecture for the CPU with separate data and instruction memory along with their respective caches.

Fractal Generator | *Java, Swing, Multi-Threading*

2020

Individual

- Designed a GUI app that generates the Mandelbrot and Julia sets according to user specifications.
- Improved image generation times using multi-threading and appropriate thread synchronization techniques.

Achievements / Certifications

Hacktitude 2022 Inter-University Hackathon | 99x

January 2022

37th place out of 200 teams

- Participated as a team of three.
- Worked on a near real-world project involving a web-based LMS application.
- **Technologies:** Node.js/Express, Javascript, EJS, SQLite, Git

iCS Hack The World 2.0 CTF Competition

December 2021

2nd Runner-Up

- 24-hour overnight Capture The Flag competition.
- Participated as a team of four.
- **Technologies:** Steganography tools (opensteg, zsteg), Cryptography tools (CyberChef, hashcat), Linux (Bash shell), Chrome Developer Tools

Linux Administration and DevOps Engineering Training Program | WSO2

November 2020

- Selected as one of 100 participants from over 1,500 registrants.
- Six-month training program covering various important topics in Systems and DevOps Engineering.
- **Technologies:** Linux (Bash shell), Google Cloud Platform, Web Servers (Apache, Nginx), Elasticsearch, Ansible

Introduction to Cybersecurity Tools & Cyber Attacks | IBM

May 2020

Certificate in Business Accounting | CIMA

November 2018

Technical Skills

Programming Languages: C, Java, Python

Hardware Programming: Verilog HDL, AVR C, ARM Assembly

Web Development: HTML/CSS, JavaScript, Node, React, Express

DBMS: SQL, MongoDB

Developer Tools: Linux (Bash shell), Git Version Control, Cloud Service Platforms (AWS, GCP)

Libraries: OpenCV, NumPy, Matplotlib, Pandas

Graphic Design/Video Editing: Adobe Photoshop, Adobe Premiere Pro

Experience

Casual Instructor (Teaching Assistant)

2021 – 2022

Faculty of Engineering, University of Peradeniya

Conducted lab sessions for second-year undergraduates at the Department of Computer Engineering under the following courses.

- CO221 – Digital Design
- CO224 – Computer Architecture

Leadership / Extracurricular

ACES (Association of Computer Engineering Students)

2019 – Present

Faculty of Engineering, University of Peradeniya

- Committee Member for the term 2019/2020.
- Assistant Secretary for the term 2020/2021.
- Secretary for the term 2021/2022. (Current)

Rotaract Club of University of Peradeniya

2019 – 2022

University of Peradeniya

- Active Member since 2019.
- Director of Public Relations for the term 2020-2021.
- Vice President of Public Relations for the term 2021-2022.

References

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

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

Dr. Asitha Bandaranayake | asithab@eng.pdn.ac.lk

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