DINDU THILAKARATHNA

Department of Computer Engineering, Faculty of Engineering, University of Peradeniya, Sri Lanka
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INTERESTS

Computer Architecture | Embedded Systems | Robotics and Automation
Algorithmic Problem Solving | PCB Designing

EDUCATION

University of Peradeniya *2017 Nov - Present*
Undergraduate in BSc. Engineering(Hons) Coputer Engineering **GPA: 3.90/4.00**
2nd of 60 Computer Engineering Students in E/16 batch

Bandarawela Central Collage, Bandarawela *2003 - 2016*
G.C.E. Advanced Level Examination
District Rank - 10, Country Rank - 471 **Z-Score: 2.0702**
Physics (A), Combined Mathematics (A), Chemistry (B)

RESEARCH EXPERIENCE

Flexible Spiking Neuron Architecture Based On RISC-V Processing Elements *2022 - Present*
Neuromorphic computing architecture to simulate spiking neurons based on RISC-V processor network on chip (Undergraduate Research Project)

Research Internship On Griffith University, Australia *2021 - Present*
Implemented a Quantum safe cryptographic algorithm based on lattice cryptography

WORK EXPERIENCE

Tronicode Engineering (PVT) Ltd (Hardware Team Lead, CO-Founder) *2020 - Present*
Mobile application, web development and embedded system development company

Projects

- Disinfection Chambers Electrical and control system (Diyathalawa base hospital)
- Drone control system project
- Gedarata Elavalu App (on PlayStore)

MECO Engineering (PVT) Ltd (Research Assistant) *2019 - Present*
Smart buildings, Electronic and Software solutions Division

SKILLS

Programming Languages	Python, Java, JavaScript, C, C++, Dart
Procedural Programming	ARM Assembly
Hardware Programming	Arduino, Verilog HDL
Numerical Computing Packages	MATLAB, Octave, Numpy
Mobile Application	Flutter, Android Studio
Web Application	Python Django, PHP Laravel
3D Modelling	Fusion360, Solid Works, AutoCad
PCB Related	Soldering, PCB design and development

PROJECTS

Project Repositories - https://dinindu.me#projects

RV32IM Pipeline processor with caches and memory *2021-2022*

- Design and tested a RV32IM 5 stage pipeline processor with verilog HDL. Designed an assembler to compile machine language code to RISC-V Architecture.
- *Project Page*

Obstacle robots for swarm robotic project *2020-2021*

- Obstacle bot capable of positioning themselves without colliding with each other for the existing swarm robotic platform.
- *Technologies: Python, OpenCV, numpy, MQTT, JavaScript, GRPC*
- *Techniques: Image Processing, stochastic gradient descent, Encryption*

Crypto currency ticker site *2020-2021*

- Crypto currency to fiet currency conversion sites with high refresh rates And analysing trends real time
- *Technologies: Python, MQTT, JavaScript, CSS, Web Sockets, Nginx, Python Django*
- *Techniques: Real time web socket connections to clients for fast refresh rates*

Vegetable delivery system seller app (Elavalu Gowiya on playstore) *2020-2021*

- Vegetable delivery system, Seller registration, Item Management and Order management
- *Technologies: Flutter, Firebase, Fire-store, Cloud Functions*
- *Techniques: Firebase and Firestore based App for Android and IOS*

Verilog Based CPU *2020*

- Designing of a 32-bit CPU which supports simple instructions with caching.
- *Technologies: Verilog*
- *Techniques: Computer Architecture*

8-bit Computer *2020*

- Design and building a 8-bit computer. This was designed in gate level and implemented as physical device
- *Technologies: Embedded system, Integrated circuits, Simulation*
- *Techniques: Computer Architecture*

Line Following robot using a camera feed and Machine Learning *2020*

- A robot which can follow a line based on the camera feed. I have created a neural network from scratch and trained it with the data set gathered by driving the robot
- *Technologies: , Raspberry Pi, Image Processing, Custom build robot*
- *Techniques: Custom Neural Network, OpenCV*

Design and installation of fully automated system for Disinfection Chambers for Diyathalawa Base Hospital, Bandarawela Hospital *2020*

Technologies: C++ Atmel Microcontollers, Costom PCB DesignTechniques: Embedded systems, Micro controller Programming, 220v Pump Controlling using contactors

Intelligent water tank filling system to Hotel ALOFT Grand, Ella *2020*

- Intelligent tank filling system, tanks located in three height levels. Controlling water pumping and solenoid valves to direct water to tanks necessary
- *Technologies: C++ Atmel Micro controller, Custom PCB design*
- *Techniques: Embedded systems, MicroController Programming, 220v Pump Controlling using contactors*

Escape route generation system during floods *2019*

- Generates escape routes during floods by estimating water levels in rivers and inundation maps.
- *Technologies: Flutter, Google Maps Direction API*
- *Techniques: Shortest Path and optimization algorithms*

Guidance Assisting System for visually impaired persons *2019*

- Stick with sensors and chest mount camera to process images, notify the details about surrounding to the blind person through a vibration belt. And a user friendly app with voice control capabilities (to find the stick if misplaced or notify relatives if the blind person needs help).
- *Technologies: Arduino Microcontroller, Raspberry Pi, Ultrasonic Sensors, Gyroscope, OpenCV, Tensorflow*
- *Techniques: Sensor Calibration, Vibration Pattern Optimization, Android Studio, Bluetooth Communication*

Various Other Hobby/Course Projects *2018-2019*

- Analog Line Follower (PD Controller based), Logic Gate level implementation of a 4-digit pass-code lock, Smart home system with raspberry PI, Wire Bending Machine (CNC)
- *Technologies: Analog and Digital Electronics, Arduino*

ACHIEVEMENTS

IEEExtreme 15.0 *2021*
(Country Rank - 4, World Rank - 109 more than 5500 teams)
Task : Algorithmic Programming Competition

DECODE 1.0 *2021*
(Country Rank - 3, more than 100 teams)
Task : Algorithmic Programming Competition

IEEExtreme 14.0 *2020*
(Country Rank - 9, World Rank - 124 more than 2200 teams)
Task : Algorithmic Programming Competition

Google Code Jam *2020*
Selected to round 2 (world rank - 3847 more than 96,000 teams)
Task : Algorithmic Programming Competition

Google KickStart *2020*
Round A (world rank - 2777 more than 100,000 teams)
Task : Algorithmic Programming Competition

IEEExtreme 13.0 *2019*
(Country Rank - 7, World Rank - 172 more than 4000 teams)
Task : Algorithmic Programming Competition

UOJ Corders v8.0 *2019*
Second Runners-up (more than 100)
Task : Inter University Algorithmic Programming Competition

Pre-Extreme *2019*
Second Runners-up (more than 30 teams)
Task : Intra University Algorithmic Programming Competition

ACES Corders v8.0 *2019*
Country Rank - 5 (more than 120 teams)
Task : Inter University Algorithmic Programming Competition

ACES Hackathon *2019*
Finalists
Project : SAFERO (Safe Route Escape System During Flood)

SLIIT Overnight Hackathon *2019*
Finalists
Project : Algorithmic Programming Competition

SLIIT CODEFEST *2019*
Merit Award
Project : You See World (Personal Guidance System to Blind people)

HACKDEV Youth Social Innovation Challenge *2019*
Selected to final teams (Get an opportunity and funds to develop our project as a product)
Project : You See World (Personal Guidance System to Blind people)

IEEE Advancing Technology For Humanity Humanitarian Technology Product Competition, General Track *2018*
Runners UP
Project : You See World (Personal Guidance System to Blind people)

ACES Corders v7.0 *2018*
Country Rank - 7 (more than 120 teams)
Task : Inter University Algorithmic Programming Competition

IEEE SS12 Age Of Innovation Product Competition *2018*
Runners UP
Project : You See World (Personal Guidance System to Blind people)

COURSES

- The remote training program for Embedded Technology Engineer in Sri Lanka - Advance Program (Performance level A), Conducted by AOTS Japan
- Introduction to Networks, CCNA Routing and Switching
- Neural Networks and Deep Learning, conducted by DeepLearnig.AI

TEACHING EXPERIENCE

Teaching Assistant, University of Peradeniya

- CO321 - Embedded Systems *2021 - present*
- CO224 - Computer Architecture *2020 - 2021*

Sessions on algorithmic programming, Hackers Club, University of Peradeniya *2020 - 2021*

EXTRA-CURRICULAR

Active member ACES of the University of Peradeniya *2020 - preset*

Active member of the Hacker's club of the University of Peradeniya *2020 - present*

REFERENCES

Prof. Roshan G. Ragel
Professor, Dept. of Computer Engineering
Univeristy of Peradeniya
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Dr. Isuru Nawinne
Senior Lecturer, Dept. of Computer Engineering
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