



Prabath Wijethilaka

Electronic and Telecommunication Engineering
Undergraduate
University of Moratuwa
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[🌐 Portfolio - prabath.auradigitallabs.com](http://prabath.auradigitallabs.com)

[/github - github.com/PrabathBK](https://github.com/PrabathBK)

[LinkedIn - Prabath Wijethilaka](https://www.linkedin.com/in/prabath-wijethilaka/)

SUMMARY

I am Prabath Wijethilaka, a Final Year undergraduate student in Electronic and Telecommunication Engineering at the University of Moratuwa, skilled in digital electronics and communications.

Interest Areas

I have a strong interest in FPGA Hardware Accelerated Systems, Computer Architecture, Embedded Systems, AI & ML, Full Stack Developing, Entrepreneurship, Sports and Outdoor Activities.

EDUCATION

• BSc (Hons) Electronic and Telecommunication Engineering

2022 - Present

CGPA/Percentage: 3.70/4.0

University of Moratuwa

• GCE Advanced Level Examinations

2012-2020

Dharmaraja College - Kandy

Physical Science Stream

– Z score - 2.5258

– District Rank - 13, Island Rank - 134

EXPERIENCE

• Hardware Accelerated Systems Engineer - Internship

On-site

London Stock Exchange Group

Dec 2024 – June 2025

I contributed to the verification of high-performance FPGA-based networking systems. I developed a UVM-driven Ethernet packet capture and replay tool capable of injecting .pcap files to reliably reproduce real production failures. I also migrated the full testbench architecture from nanosecond to femtosecond precision, resolving critical timing alignment issues in the TCP Offload Engine pipeline. Additionally, I explored Linux kernel driver operation for configuring the Xilinx Alveo U50 data-center FPGA and integrated Model Checking principles into the verification methodology to strengthen functional correctness and coverage.

• Aura Digital Labs - Co-Founder

Remote

Aura Digital Labs

May 2024 – Present

Co-founded and led a digital solutions agency delivering embedded systems, full-stack applications, computer vision, and automation solutions for small-to-medium enterprises.

RECOMMENDATIONS

"Prabath demonstrated outstanding self-learning skills, quickly adapting to our existing codebase with minimal intervention and significantly improved the test bench's running time. I highly recommend Prabath to any organization. He would be an invaluable asset to any forward-thinking organization"

— **Nuwantha Silva, Assoc. Tech Lead (FPGA), London Stock Exchange Group**

(LinkedIn Recommendation)

[View full recommendation on LinkedIn](#)

TECHNICAL SKILLS

– **Languages:** Verilog, SystemVerilog, Java, C++, Python, SQL, React, JavaScript, Dart, HTML, CSS

– **Developer Tools:** Vivado, Vitis, Quartus, IntelliJ, MATLAB, GitLab, Altium Designer, SolidWorks, Android Studio, Gazebo, Docker, Postman

– **Frameworks:** UVM, Spring Boot, Flutter, Arduino, Scikit-learn, ROS2

– **Cloud/Databases:** Firebase, Mongo DB, Microsoft Azure, MySQL

– **Operating Systems:** Ubuntu, RedHat , Raspbian, Windows

– **Soft Skills:** Problem-Solving, Team Leadership, Project Management, Teamwork, Public Speaking, Finance and Account management, Strategic Decision-Making, Digital Marketing, Teaching, Photography, Videography

CONFERENCES & WORKSHOPS

- DVCon India 2025 – Design and Verification Conference

Radisson Blu, Marathahalli, Bangalore

September 10–11, 2025

Runners-up – Design Contest

* Awarded **1st Runners-up** at the DVCon India 2025 Design Contest organized by CDAC Trivandrum - [Link](#).

* Designed a custom accelerator for the **VEGA AT1051 SoC** and built a framework capable of running the **full Qwen3 inference pipeline on bare metal**, demonstrating strong hardware-software co-design skills while competing against top university and industry teams in a rigorous verification challenge.

- LEAD CS 8.0 – Leadership Development Program

Hotel Ramrich, Ja-Ela

AIESEC Society – University of Moratuwa

March 2022

PROJECTS

- SLMs on Edge - 1st Runners-Up | DVCon India 2025 – Design and Verification Conference

[Repository](#)

FPGA Accelerator for Qwen3 SLM Inference

Jan 2025 – Sep 2025

* Designed a complete hardware software co-design framework enabling **Qwen3 SLM inference on the VEGA AT1051 RISC-V SoC**, reducing latency through FPGA-accelerated GEMM offloading.
* Built a full bare-metal runtime capable of executing the entire Qwen3 pipeline, including custom memory allocation, AXI-based data movement, and CPU-FPGA synchronization for deterministic sequential inference.
* Developed a lightweight systolic array accelerator featuring **INT8 GEMM**, 16×16 tiled architecture, double buffering, AXI4/AXI-Lite integration, and optimized DMA dataflow, delivering high-throughput GEMM execution on edge hardware.

- Chip-Aware Instrument | Final Year Project

Ongoing

Unified IC Testing Platform with AI-Driven Datasheet Parsing Collaboration with aevocode

June 2025 – Present

* Developed transformer-based AI agent that auto-extracts structured IC metadata from datasheets, enabling configuration across diverse protocols.
* Built Rust GUI with IC configuration/monitoring, driving KR260 and Artix 7 FPGA controllers through modular expansion PCB with sensing signal analyzer.

- Hardware accelerator for a Vision Transformer-based malware detection system

[Report](#)

Accelerating ViT-based malware detection on edge devices with VEGA AS1061 Processor, based on RISC-V ISA.

Jan 2024

* This project aims to deploy a ViT-based malware detection system on an edge device equipped with the VEGA AS1061 Processor
* Stage 1 focuses on proposing a novel acceleration IP to enhance the ViT model's inference performance on the VEGA Processor, ensuring effective malware detection in real-world scenarios.

- SIMD Processor Array for Convolution Neural Network

[Report](#)

High-Performance CNN Processor with 32-bit ISA on ZedBoard Zynq-7000

Aug 2025 – Present

* Architected a systolic array accelerator with custom 32-bit ISA, row-stationary dataflow, pipelined processing element design, and hierarchical memory subsystem with PE register files, global buffers, and AXI4 DMA engine for ARM-FPGA communication.

- RV32I Processor Design and Implementation on FPGA

RV32I Single Cycle and Pipeline Core

Jul 2024 – Jan 2025

* **Single-Cycle Core:** Developed a fully verified 32-bit RV32I single-cycle CPU in SystemVerilog with full instruction support and FPGA-ready architecture. - [Check Repository](#)
* **Pipelined Core:** Implemented a 5-stage pipelined RV32I CPU with hazard detection, forwarding, stall control, and branch prediction, achieving full RV32I functional verification. - [Check Repository](#)
* SystemVerilog, Vivado, RISC-V, and RTL verification.

- Serial Bus Design

[Repository](#)

Custom RTL Bus Interconnect with Arbitration and Split Transactions

Aug 2025 – Nov 2025

* Designed and implemented a multi-master serial bus on Intel Cyclone IV FPGA with priority arbitration, split transactions, and UART-based inter-FPGA bridging.
* Achieved low resource utilization using a 1-bit serial protocol supporting two masters and three slaves, with FIFO-based clock-domain crossing and full RTL and hardware verification.
* SystemVerilog, FPGA RTL Design, AMBA Bus Protocols, UART, Quartus Prime

- EcoWatt – Smart Inverter Monitoring & Control System

[Repository](#)

ESP32-Based IoT Platform for Solar Inverter Telemetry

Aug 2025 – Nov 2025

* Designed and developed a production-ready IoT platform for real-time solar inverter monitoring, featuring secure telemetry with multi-layer protection, adaptive data compression, Modbus support, power-optimized operation, and a bidirectional command queue for remote control.

<ul style="list-style-type: none"> * Implemented a robust FOTA and reliability framework with signed updates and rollback protection, backed by extensive automated testing, fault-injection validation, and a professional real-time React dashboard for analytics and device diagnostics. * ESP32, PlatformIO, Python Flask, MQTT 	
- TransX – Transformer Maintenance Full-Stack Web Platform <i>End-to-end inspection workflow with CV-based anomaly detection and annotation system</i>	Repository Jul 2025 – Nov 2025
<ul style="list-style-type: none"> * Built a complete transformer inspection workflow with thermal image management, CV-based anomaly detection, and human in the loop annotation capabilities. * Developed modular backend services and a responsive frontend supporting role-based access, multi-user comments, and maintenance record generation. * Spring Boot, Java, MySQL, Flask, YOLOv8 	
- Factory Assembly Line Management Full-Stack Development with Modular OOP Design <i>Developed a web application as a submodule within a main project.</i>	Jan 2024 - May 2024 Repository
<ul style="list-style-type: none"> * Integrating backend functionalities with frontend components to assembly line operations. * Spring boot, Java, MongoDB, React, Postman, Rest API 	
- Project Hydrolink - Champions SLIoT Challenge 2023 <i>A Complete IoT Device Revolutionizing Smart Water Tank Management</i>	2023 - 2024 hydrolink.auradigitallabs.com
<ul style="list-style-type: none"> * A complete IoT device revolutionizing water tank management. * Arduino IDE, ESP Microcontroller, Google Firebase, Flutter, SolidWorks, Altium 	
- High-Performance Trading System in C++ <i>Flower Exchange Order Matching Engine</i>	Repository Aug 2024 – Nov 2024
<ul style="list-style-type: none"> * Developed a high-performance C++ order matching engine implementing price-time priority, in-memory order books, and full order validation across multiple instruments. * Designed the C++ backend architecture including matching logic, execution state handling, and CSV-based batch processing with test coverage. 	
- Steer-Safe - Championship IEEE Circuit Challenge 2024 and 1st Runners-Up Brainstorm 2024 <i>Drowsiness Detection system</i>	Repository Jun 2024 – Oct 2024
<ul style="list-style-type: none"> * Developed a lightweight, eyewear-integrated driver safety device using embedded systems, Communication Protocols, and low-power firmware for real-time drowsiness and attention monitoring. 	
- Gazebo Robot Simulation <i>Robot Simulation Project using ROS2 Humble and Gazebo</i>	May 2024 Repository
<ul style="list-style-type: none"> * Map a room and navigate the robot from one location to another, avoiding obstacles along the way. Additionally, perform object tracking. * Gazebo, Ros2, Ubuntu, OpenCV 	
- Point-to-Point Communication Design project <i>A secure and reliable point-to-point digital wireless communication system using SDR.</i>	Aug 2023 - Dec 2023 Repository
<ul style="list-style-type: none"> * Successful transmission and reception of diverse data types, such as images, text, and real-time audio. * Python, GNU radio, MATLAB 	
- Industrial Portable Water Quality Measurement Device <i>Developed an industrial portable water quality measuring device using sensor technologies and a Mobile app.</i>	Jan 2024 - May 2024 Repository
<ul style="list-style-type: none"> * Capable of accurately measuring four key parameters: pH, Turbidity, Conductivity, and Temperature. * Arduino-IDE, ESP-Microcontroller, Google Firebase, Flutter, SolidWorks, Altium 	
- UART Communication System Implementation on FPGA using Verilog <i>Implemented and tested a UART communication system on an FPGA using Verilog.</i>	May 2024 Repository
<ul style="list-style-type: none"> * Utilized Quartus Lite for FPGA development and integrated Raspberry Pi for data input. * Verilog-HDL, Quartus Lite, FPGA, Raspberry-pi, Python 	
- Analog Portable Audio Amplifier <i>We have designed a Portable Audio Amplifier using only analog components.</i>	Aug 2023 - Dec 2023 Repository
<ul style="list-style-type: none"> * Our device is capable of amplifying audio input from any audio-generating device through three main sub-circuits: preamplifier, tone controller, and power amplifier. We've implemented the Baxandall passive tone controller. * Simulink, Proteus, LT-Spice, Altium, Solidworks 	
- Machine Learning Projects Repository	
<ul style="list-style-type: none"> * DiabetesAI-Webproject * SMS spam detector * Stock prediction * Breast Cancer Wisconsin Diagnostic Predictor * Cardiovascular Disease Predictor 	

AWARDS

- **1st Runners-Up | DVCon India 2025 – International Design Contest** 2025
SLMs on Edge – Accelerator IP and bare-metal inference engine designed to run full Qwen3 pipeline on the RV32 SoC.
- **Championship | SLIoT Challenge 2023 - All island IoT competition** 2023
Hydrolink - A Complete IoT Device Revolutionizing Water Tank Management
- **Championship | IEEE Sri Lanka Circuit Challenge 2024** 2024
Steer Safe - A wearable device that utilizes ML and EOG signals to track a driver's state of awareness in real-time.
- **1st Runners-Up | Brainstorm 2024 - Healthcare innovation competition** 2024
Steer Safe - A wearable device that utilizes ML and EOG signals to track a driver's state of awareness in real-time.
- **Stage 2 (Top 20) | DVCon India 2024 - International Design Contest** 2024
GateMasters - Design a hardware accelerator for a Vision Transformer malware detection system on a VEGA Processor.
- **Finalist | HackX 2024 - Inter University Startup Challenge** 2024
Hydrolink - A Complete IoT Device Revolutionizing Water Tank Management.
- **Dean's List**
Semester 2, 6, 7

SPECIALIZATIONS AND CERTIFICATIONS

- **Function Acceleration on FPGA with Vitis**
Udemy
- **Linux Device Drivers**
LinkedIn Learning
- **High-Performance and Mission-Critical Software Development Using C++**
London Stock Exchange Group
- **Introduction to FPGA Design for Embedded Systems**
University of Colorado Boulder - Coursera
- **FPGA Softcore Processors and IP Acquisition**
University of Colorado Boulder - Coursera
- **Hardware Description Languages for FPGA Design**
University of Colorado Boulder - Coursera
- **Machine Learning Specialization**
Deeplearning.AI - Coursera
- **AAT Level 3 Completed**
Association of Accounting Technicians of Sri Lanka
- **Diploma in English**
Esoft Metro Campus - Sri Lanka
- **Diploma in IT**
Esoft Metro Campus - Sri Lanka

EXTRA-CURRICULAR AND VOLUNTEERING

- **Volunteer Developer – FloodSupport Sri Lanka - stats.floodsupport.org** 2025
Community Disaster Relief Initiative – Sri Lanka
- **Judge Board – HackElite 2.0** 2025
IEEE Sri Lanka Women in Engineering – University of Moratuwa
- **Conduct Knowledge Session: Advanced Biomedical Electronics & Computational Technologies** 2025
IEEE EMBS Student Branch Chapter – University of Moratuwa
- **Conduct Knowledge Session: Raspberry Pi Web Services** 2025
Pi Mora, SPARK Branch - University of Moratuwa
- **Head of Marketing** Aug 2025 - Present
Electronic Club - University of Moratuwa
- **Marketing Coordinator** Sep 2024 - Aug 2025
Electronic Club - University of Moratuwa
- **Social Media Sub-Coordinator** Aug 2023 - Sep 2024
Electronic Club - University of Moratuwa
- **Social Media Sub-Coordinator** Aug 2023 - Sep 2024
Electronic Club - University of Moratuwa
- **Department Batch Representative** Jan 2024 - May 2025
Department of Electronic and Telecommunication Engineering - University of Moratuwa

– Finance Committee member	<i>IEEE Society University of Moratuwa - project "Mora Foresight 1.0"</i>	<i>Mar 2023 - Aug 2023</i>
– Event Sub-Committee member	<i>EXMO - University of Moratuwa</i>	<i>July 2023 - Aug 2023</i>
– Finance Committee member	<i>AIESEC Society University of Moratuwa - project "Rooted 1.0"</i>	<i>Aug 2022 - Dec 2022</i>
– Junior Prefect	<i>Dharmaraja Collage - Kandy</i>	<i>Jan 2015 - Dec 2015</i>
– President of Collage Hosteler's Society	<i>Dharmaraja Collage - Kandy</i>	<i>Jan 2017 - Dec 2017</i>
– Volunteering in Sasnaka Sansada	<i>Teaching experience with Volunteering in "Ganitha Saviya" Project</i>	<i>2021 - 2022</i>

SPORTS AND ACTIVITIES

- Sri Lanka University Games Championship 2023**
University Baseball Team - University of Moratuwa
- Participated STRIDIAN'23**
Mora Hiking Club - University of Moratuwa
- Captain of the college under 17 volleyball team**
Dharmaraja College - Kandy
- Obtained a 'Merit' for Hockey on Annual "Colors Nite".**
Dharmaraja College - Kandy
- Member of the college Baseball, and Hockey team**
Dharmaraja College - Kandy

REFERENCES

- Ajith A. Pasqual,**
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