



## Prabath Wijethilaka

Electronic and Telecommunication Engineering  
Undergraduate  
University of Moratuwa  
Sri Lanka

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🌐 [Portfolio - prabath.auradigitallabs.com](https://prabath.auradigitallabs.com)  
🐙 [Github - github.com/PrabathBK](https://github.com/PrabathBK)  
🌐 [LinkedIn - 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  
*University of Moratuwa* CGPA/Percentage: 3.69/4.0
- **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

– **DVCon India 2025 – Design and Verification Conference**

*Radisson Blu, Marathahalli, Bangalore*

*Runners-up – Design Contest*

September 10–11, 2025

- \* 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**

*AIESEC Society – University of Moratuwa*

*Hotel Ramrich, Ja-Ela*

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**,  $16 \times 16$  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.

- \* 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** [Repository](#)  
*End-to-end inspection workflow with CV-based anomaly detection and annotation system* Jul 2025 – Nov 2025
  - \* 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** *Jan 2024 - May 2024*  
[Repository](#)  
*Developed a web application as a submodule within a main project.*
  - \* Integrating backend functionalities with frontend components to assembly line operations.
  - \* Spring boot, Java, MongoDB, React, Postman, Rest API
- **Project Hydrolink - Champions | SLIoT Challenge 2023** *2023 - 2024*  
[hydrolink.auradigitallabs.com](https://hydrolink.auradigitallabs.com)  
*A Complete IoT Device Revolutionizing Smart Water Tank Management*
  - \* A complete IoT device revolutionizing water tank management.
  - \* Arduino IDE, ESP Microcontroller, Google Firebase, Flutter, SolidWorks, Altium
- **High-Performance Trading System in C++** [Repository](#)  
Aug 2024 – Nov 2024  
*Flower Exchange Order Matching Engine*
  - \* 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** [Repository](#)  
Jun 2024 – Oct 2024  
*Drowsiness Detection system*
  - \* 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** *May 2024*  
[Repository](#)  
*Robot Simulation Project using ROS2 Humble and Gazebo*
  - \* 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** *Aug 2023 - Dec 2023*  
[Repository](#)  
*A secure and reliable point-to-point digital wireless communication system using SDR.*
  - \* 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** *Jan 2024 - May 2024*  
[Repository](#)  
*Developed an industrial portable water quality measuring device using sensor technologies and a Mobile app.*
  - \* 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** *May 2024*  
[Repository](#)  
*Implemented and tested a UART communication system on an FPGA using Verilog.*
  - \* 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** *Aug 2023 - Dec 2023*  
[Repository](#)  
*We have designed a Portable Audio Amplifier using only analog components.*
  - \* 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](#)
  - \* [DiabetesAI-Webproject](#)
  - \* [SMS spam detector](#)
  - \* [Stock prediction](#)
  - \* [Breast Cancer Wisconsin Diagnostic Predictor](#)
  - \* [Cardiovascular Disease Predictor](#)

## AWARDS

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- **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*

## SPECIALIZATIONS AND CERTIFICATIONS

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- **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

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- **Volunteer Developer – FloodSupport Sri Lanka - [stats.floodsupport.org](https://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** *Mar 2023 - Aug 2023*  
*IEEE Society University of Moratuwa - project "Mora Foresight 1.0"*
- **Event Sub-Committee member** *July 2023 - Aug 2023*  
*EXMO - University of Moratuwa*
- **Finance Committee member** *Aug 2022 - Dec 2022*  
*AIIESEC Society University of Moratuwa - project "Rooted 1.0"*
- **Junior Prefect** *Jan 2015 - Dec 2015*  
*Dharmaraja Collage - Kandy*
- **President of Collage Hosteler's Society** *Jan 2017 - Dec 2017*  
*Dharmaraja Collage - Kandy*
- **Volunteering in Sasnaka Sansada** *2021 - 2022*  
*Teaching experience with Volunteering in "Ganitha Saviya" Project*

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## 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*

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## REFERENCES

- **Ajith A. Pasqual,**  
B.Sc. Eng. (Moratuwa, Sri Lanka), M.Eng. (Tokyo), Ph.D. (Tokyo), MIEEE, MACM,  
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