Sanjuna Rathnamalala

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Personal Statement

Passionate Computer Science Engineering undergraduate specializing in Integrated Circuit Engineering. Enthusiastic about embedded networking, hardware architecture and software development. Eager to leverage hands-on experience in real-time processing and communication protocols to contribute to innovative engineering teams.

Education

BSc Engineering Honours in Computer Science & Engineering *2024 - 2028*

University of Moratuwa, Sri Lanka

- Currently in the 5th semester, specializing in Integrated Circuit Engineering.

Pearson BTEC Level 5 HND in Computing *2022 - 2024*

ESOFT Metro Campus

Projects

Autonomous Object Tracking Robot | Repository

- Developed launch files and communication interfaces for a Quanser Qbot to enable autonomous object tracking and following utilizing ROS 2, Python, and C++.
- Configured a physical environment utilizing a Raspberry Pi 4, Ubuntu 22.04 LTS, and a Kobuki robot base, establishing communication via UART, I2C, and SPI protocols.

PredictiveOps: Predictive Maintenance System | Repository

- Architected a real-time stream processing pipeline in Go, leveraging Apache Kafka for high-frequency sensor data consumption and tumbling window buffering.
- Engineered statistical algorithms deployed via a FastAPI engine to extract machine-learning-ready features from raw telemetry data.

Hotel Service Management System | Repository

- Engineered the full-stack administrative portal for a comprehensive hotel reservation and guest management system utilizing Python, implementing both frontend interfaces and backend logic.
- Integrated a secure MySQL database to efficiently manage user authentication, room availability and billing records in real time. Streamlined the reservation workflow to reduce booking latency and improve overall guest tracking accuracy.

Nanoprocessor Design | Repository

- Designed and implemented a custom nanoprocessor on Basys 3 FPGA utilizing VHDL, featuring a 13-bit Instruction Set Architecture (ISA) capable of executing 8 distinct operations.
- Simulated and verified the processor logic using Xilinx Vivado test-benches to ensure accurate data routing, memory mapping and adherence to strict timing constraints.

Technical Skills

- **Programming:** Python, C++, C, Go, ROS2
- **Web Development:** React, FastAPI, Next.js
- **Databases:** MySQL
- **Embedded Systems:** ESP32, FPGA, VHDL

References

Dr. Sulochana Sooriyaarachchi

PhD (Moratuwa), MSc (Moratuwa), BSc Eng. (Hons) (Peradeniya), AMIE (SL)

Designation: Senior Lecturer

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