Tharun Ganeshram

tganeshr@uwaterloo.ca linkedin.com/in/tharun-ganeshram github.com/TharunGaneshram

Technical Skills

Languages & Frameworks: C, C++, Python, Bash, Expect-Lite (TCL extension), LVGL
Electrical & Hardware: I2C, SPI, CAN, UART, STM32, ESP32, Arduino, Raspberry Pi, Pixhawk, Circuit Design, Soldering
OS & Tools: Linux, FreeRTOS, IAR, MATLAB, Simulink, Git, Jira, Confluence, AutoCAD, SolidWorks, Jenkins

Education

University of Waterloo **Sep. 2022 – Apr. 2027**
*Candidate for Bachelor of Applied Science (B.A.Sc.) in **Honours Systems Design Engineering*** *GPA: 4.0*

Relevant Experience

Firmware Engineer **May 2024 – Present**
Blackline Safety Corporation *Waterloo, ON*

- Implemented **UART** communication, **BSP** control signal abstraction & sensor classes in **C++** for **5** new EXO8 sensors
- Configured execute-in-place flash memory & clock with screen optimizations for **6x increase** in XIP processing rate
- Coded **30+ embedded UI components** for dual-screens in **LVGL** to enhance EXO gas sensor unit user workflow

Embedded Flight Software Developer **May 2024 – Present**
Waterloo Aerial Robotics Group *Waterloo, ON*

- Investigated & architected **STM32 DroneCAN** integration, decoding, and debugging for real-time communication
- Established the conversion of **DroneCAN** servo signals from a **Pixhawk** to PWM motor signals using **STM32** in **C**

Firmware Developer & Team Lead **Dec. 2022 – Present**
Waterloop (University of Waterloo Hyperloop Design Team) *Waterloo, ON*

- **Increased task throughput 35%** by designing **FreeRTOS** architecture, task prioritization & resource management
- Acheived battery safety compliance by configuring thermistors and fans to **STM32** & **Raspberry Pi** using **SPI** & **CAN**

Embedded Software Developer **Jan. 2023 – Apr. 2023**
Ciena Corporation *Ottawa, ON*

- Enhanced optical network device software using bit-level manipulation, direct memory access & error handling in **C**
- Engineered **Expect-Lite** to **Python** converter, reducing manual file upgrade time from **3 weeks to 5 hours**
- Modernized legacy **Bash** Sanity systems using **Python**, redesigning logic with modules to **reduce runtime by 80%**

Projects

Omni-Directional Bluetooth Car | *Embedded C, STM32, ESP32, UART, SolidWorks*

- Designed car body & firmware using **servo motors**, **STM32**, and **ESP32** for real-time **UART Bluetooth** control

5-Bar Pick and Place Mechanism | *Arduino Programming Language, BotBoarduino*

- Established precise payload transportation using **hobby servos**, **BotBoarduinos** & inter-board communication

Real-Time Object Recognition App | *Python, TensorFlow, OpenCV*

- Trained unsupervised ML model using **TensorFlow** & **OpenCV** to accurately identify & classify objects in live video

Additional Experience

Data Science & Machine Learning Engineer **Dec. 2022 – Dec. 2023**
OpenHaus *Ottawa, ON*

- Developed data preprocessing pipeline & employed various **Python** machine learning algorithms through **pandas**, **scikit-learn**, **TensorFlow**, and **Keras** to model customer behaviour and predict rental prices with **93% accuracy**

Software Developer **Jun. 2022 – Sep. 2022**
Ciena Corporation *Ottawa, ON*

- Increased employee log analysis **efficiency by 70%** with the development of a **Python** retrieve log processing tool
- Coded optical network shelf connection Class, log data parsers & database upload Class to run in **under 5 minutes**

Warrant Officer First Class **Sep. 2016 – Jun. 2022**
75 Air Cadet Squadron *Ottawa, ON*

- Enabled **300+ cadets** and **70 instructors** to hone their skills by planning/leading survival camps, physical & mental training, fundraisers, and service opportunities; **2021 Major Ali Leadership award** recipient