Joel Lee

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SKILLS

Programming Knowledge: C/C++, C#, Python, Java, XML, Matlab, Git, LaTeX
Embedded systems: Texas Instruments, Onsemi, VectorNAV, Arduino, Raspberry Pi
CAD & PCB design: OnShape, Solidworks, Altium Designer
OS: Linux, Windows
Applications: Word, Excel, PowerPoint, Teams, VScode, CLion, Atlassian/Agile methods, Jenkins

WORK AND TECHNICAL PROJECTS

FIRMWARE DEVELOPER | ONSEMI — Waterloo, ON | Jan 2023 - Apr 2023

- Implemented and validated the world's lowest power bluetooth chip (RSL15) targeting industries for implantable medical devices, automotives and hearables.
- Developed multi-protocol SoC for ultra–low power secure Arm Cortex–M33 processor in an Agile environemnt using C/C++.
- Released RSL15 SDK 1.5 firmware package with new sample applications, libraries and drivers.
- Created code template generation for BLE peripheral server standby sample code.
- Designed and refactored the calibration routine for essential low power clocks and ADC.
- Created a feature that allows users to configure the number of bond records allocated in FLASH.
- Provided technical content for user-end documentation.

HARDWARE & FIRMWARE DEVELOPER | UW ORBITAL — Waterloo, ON | May 2022 - Aug 2022

- Part of a team designing a satellite payload system used for image capture in space.
- Built the attitude determination and control systems (ADCS) board for controlling sensors and actuators that stabilize the orientation of the cube satellite in space.
- Implemented firmware in an embedded environment using C/C++ for a Texas instruments microcontroller to read from an internal measurement unit (IMU) and control actuators. Version control for the firmware was managed within a github branch.
- Researched, selected and sourced motor drivers, motors and IMU for the attitude determination system.
- Developed and designed a PCB with Altium designer. Created test cases for debugging hardware and firmware.

GESTURE CONTROLLED VEHICLE — Python, Raspberry Pi, Flask, Computer Vision, Multiprocessing

- Designed A robotic vehicle capable of being controlled by intuitive hand motions. System included multiple Raspberry Pi's for driving motors as well as reading, transmitting and processing sensor data.
- Created a flask web server for user to view the vehicle's real time camera output.
- Implemented traffic sign detection software using YOLO's object detection algorithm and OpenCV.

MORSE CODE TRANSLATOR — Arduino, C++

- Created An Arduino system containing a transmitter and receiver for Morse code using an LED and photo resistor. System is capable of encoding inputs into visual Morse code that can be decoded.

EXTRACURRICULARS

KANATA MUSIC ACADEMY | VIOLIN TEACHER — Ottawa, ON | May 2020 – Jun 2021

- Taught elementary and intermediate music theory and violin performance for young musicians.

EDUCATION

BASc. Biomedical Engineering (2026 Candidate) — Waterloo, ON
University of Waterloo