GORDON FOUNTAIN

Mechatronics Student, Robotics Enthusiast, & Cellist

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EXPERIENCE

Firmware Developer

University of Waterloo Aerial Robotics Group Feb 2021 – Present

- Architected and created the System Manager module to manage thread operation, inter-thread communication, and flight mode selection for an autonomous VTOL and fixed-wing hybrid drone.
- Designed, modeled, and built the pre-flight, takeoff, and landing system for use with a computer-vision controlled precision-landing system.
- Created a new Firmware Training Bootcamp with documentation for new firmware team members, giving practical experience with SPI communication, schematics, and component interfacing.

Robotic Software Intern

Kindred Robotics Sept 2022 – Dec 2022

- Implemented an inheritance-based thread-safe callback system and used it to add metrics and fault reporting to a new system.
- Ran unit, functional, and system level testing of development code on lab robotic arms that was deployed to in-production robotic stations.
- Created a data recording system using Python, C++, Go, and SQL querying to gather data for use by multiple other teams.

Embedded Development Intern

Skygauge Robotics May–Aug 2021 & Jan–April 2022

- Wrote a real-time system for a microcontroller to interface sensors and actuators to successfully allow stable drone-to-surface contacts and ultrasonic measuring
- Improved communication robustness between drone microcontrollers by building a no-loss acknowledgement system to maximize flight control.
- Created a QT based desktop app from scratch to display video feeds, ultrasonic data, and flight statistics through a UDP network system.

Roboticist (Mechanical and Firmware)

2unify Feb 2021 – May 2021 (Part-time)

- Invented and iterated upon a robotic effector system for a 6 degree of freedom robotic arm.
- Coded controls and embedded processes for a student-usable interface.

ADDITIONAL EXPERIENCE

Hexapod Walking Robot

- Designed and coded the controls and interface for a walking hexapod robot. Currently collaborating on the mechanical design and electrical assembly.

CNC Maze-Solver Robot

- Created a CNC machine accurate to within 3mm using a 2 axis belt and moving platform system, then used a colour sensor and coded a logic algorithm to solve mazes of a given format

Class Wellness Representative

- Managed deadlines, ran events to improve class morale, addressed teaching issues, and garnered additional learning resources for missed material by voicing class wellness issues

SKILLS & TOOLS

Rapid Prototyping | Design for 3D Printing | Circuit Design | Sensor Integration | Communication Protocols | Actuator Control | Design Sketching

C++ | Embedded C | Python | Bash | Docker | ROS | Arduino | MatLab | VS Code | Git | VHDL | LaTeX | AutoCAD | SolidWorks | MS Office Suite

AWARDS

WEC Senior Design Champion

- Designed dual-ended scoop and plow RC robot for the Waterloo Engineering Competition | 2022-2023

OEC Senior Design Finalist

- Prototyped a last-mile stair-placement robot for the Ontario Engineering Competition | 2021-2022

WEC Senior Design Champion

- Designed an optical modular small-footprint marble sorter for the Waterloo Engineering Competition | 2021-2022

CEC Junior Design Finalist

- Built a resource transportation robotic arm | 2020-2021

OEC Junior Design Champion

- Created a long-distance martian material transport zip-line device | 2020-2021

WEC Junior Design Champion

- Created a physics-based water transport network | 2020-2021

Primus Alumnus

- Top male graduating student from Eastwood Collegiate High School | 2019

HOBBIES

Cello | Music Recording | Rock Climbing | CAD Design | D&D | 3D Printing

EDUCATION

Enrolled in B.A.Sc. in Mechatronics Engineering

University of Waterloo Sept 2019 – June 2024