Owen Leather

Engineering Student | Software Developer | Robotics Enthusiast

oleather@uwaterloo.ca

oleather.github.io

github.com/OLeather

SKILLS

Programming – Kotlin, Java, Python, C++, C#

ROS2, OpenCV, Open3D, Eigen, Gazebo, Lanelet2, ActiveMQ

DevOps – Git, Gradle, CMake, Docker, Ansible

Controls – PID, State Space, Motion Control, Model Predictive Control, Kalman Filtering, Pose Estimation

Game Engines – Unreal Engine, Unity 3D

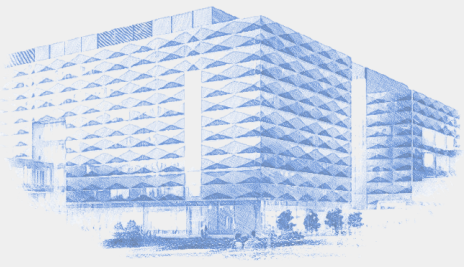
Manufacturing – Solidworks, Fusion 360, CAD/CAM, 3D Printing

AWARDS

FIRST Robotics Innovation in Controls Award - 2022

FIRST Robotics Autonomous Award - 2021

FIRST Robotics Autonomous Award - 2019



EXPERIENCE

Robotics Engineering Intern, Toronto, ON — *Quantum Robotic Systems*

January 2023 - April 2023

Skills: C++, Python, ROS, Docker, OpenCV, PID, Motion Control

- Developed computer vision system using OpenCV for global pose localization within 1 cm
- Built ROS2 infrastructure for mobile robot platforms to increase target market and allow for vision, navigation, and advanced controls
- Implemented custom I2C and Serial protocol links between ESP32 and Raspberry Pi for ROS, vision, and logging
- Implemented PID control laws and dynamic motion profiling for robot subsystems to improve motion performance and tolerances by 80%

Tech Lead, World Modeling, Waterloo, ON — *WATonomous*

December 2023 - Present

Skills: C++, ROS, Docker, Autonomous Vehicle, Occupancy Grid

- Developed C++ code using ROS2 within Docker infrastructure for an embedded autonomous vehicle utilizing cameras, LiDAR, and radar
- Implemented cutting-edge research in point cloud segmentation, motion prediction, and multi-agent simulation using Tensorflow and PyTorch
- Derived architecture for software including novel solutions for HD map navigation, LiDAR localization, and dynamic voxel grid mapping

Software Engineering Intern, San Francisco, CA — *iMetalx*

August 2021 - August 2022

Skills: Kotlin, Python, C++, C2 Messaging, OpenCV, ActiveMQ, Gazebo Simulator

- Implemented government standards in command and control messaging and tactical mesh networks for communication within a 25 km range
- Created Hardware in The Loop simulator using Gazebo for testing and developing on UAV platforms and embedded systems
- Developed embedded CPython interface for a native Kotlin application to run Python libraries on Android devices enabling additional features
- Built application for controlling UAVs within ATAK (Android Team Awareness Kit) for interoperability with government programs
- Worked on stereoscopic vision-based SLAM algorithm enabling onboard navigation for small form-factor UAVs

PROJECTS

Pendulum Controls | *Python, MPC, State Space*

2022

- Applied controls project to control an inverted pendulum on a cart using linear state space control and nonlinear model predictive control

Check out my website for more projects: oleather.github.io

EDUCATION

University of Waterloo, Waterloo, Ontario — *BASc Mechatronics Engineering*

September 2022 - April 2027