

# JOEY QUINLAN

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## EDUCATION

### University of Alberta

Honors Computing Science, BSc

**Relevant Coursework:** OS, Algorithms, DB Management, Numerical Methods, Machine Learning, Robotics, Graphics

Sept. 2020 – Dec. 2024

**Cumulative GPA:** 3.9/4.0

## WORK EXPERIENCE

### Undergraduate Research Assistant | Python, OpenCV, NumPy, Pandas, MLFlow | [code](#) | [paper](#) May 2023 – Aug. 2023

University of Alberta

Edmonton, AB

- Received the \$8000 NSERC USRA to build a video processing algorithm capable of detecting and tracking 15 classes of vehicles, reducing manual data extraction time by 75%
- Implemented a closed-loop active learning pipeline utilizing **Roboflow**, alleviating an unbalanced data set and cutting off 80% of manual labeling time
- Labeled and reviewed 5000+ images for object detection over a week-long annotation sprint, building a foundational data set for further research

### Software Engineering Intern | Python, OpenCV, Django

Promise Robotics

May 2022 – Aug. 2022

Edmonton, AB

- Engineered sequencing actions for a robotic cell by leveraging **Django** models and unit tests, providing building blocks for more complex robot activity
- Designed a multi-threaded client-server computer vision system using **Python** and the StereoLabs **ZED SDK**, resulting in a 3x increase in acquired image data
- Extracted wood stud locations with a precision of 5mm using **OpenCV's** edge detection and color space transforms

## EXTRACURRICULARS

### University of Alberta Formula Racing | ROS2, C++, Python, Docker

Aug. 2023 – Present

- Co-leading the development of an autonomous driving stack for an electric Formula 1 racecar
- Facilitated the onboarding of new members with a streamlined software setup and knowledge acquisition pipeline
- Containerized our software stacks with Docker to allow for consistent development across operating systems
- Designed ROS2 nodes for our perception pipeline, from camera data acquisition to object detection/localization

### Autonomous Robotic Vehicle Project | ROS2, Python, OpenCV

Jan. 2023 – Aug. 2023

- Collaborated with a small team to build a software stack capable of piloting an underwater autonomous vehicle
- Generated 3D bounding boxes for pose detection ground truth data by utilizing Apriltags, OpenCV, and NumPy
- Constructed behavior trees using the Py Trees library to allow for easy composition of mission tasks such as object detection and recovery behavior

## PROJECTS

### Autonomous Foosball, with a Twist | Python, OpenCV, NumPy | [code](#)

Dec. 2023

- Engineered a 1v1 autonomous foosball/pong system for a final course project
- Calibrated a fixed-camera system using OpenCV calibration and point projection functionality, along with empirical testing, to reduce localization error to  $\approx 0.2$  cm in both x and y directions
- Built a multi-threaded image processing loop with an eye for speed, capable of detecting objects and building trajectory estimates while maintaining 28 fps for real-time operation

### JournAI (HackED Hackathon) | JavaScript, React, Next, Firebase | [code](#)

Jan. 2023

- Built a journalling app with a team of four that integrates with an NLP model to give users data on their emotions
- Utilized Firebase for authentication and Cloud Firestore for storing user journal entries and emotion data
- Leveraged Next.js dynamic page routing and Firestore query functionality to provide the user easy access to previous journal entries

## TECHNICAL SKILLS

**Languages:** Python, C/C++, JavaScript, SQL, MATLAB

**Technologies:** OpenCV, ROS2, Git, Docker, NumPy, OpenGL, PyTorch, Pandas, MLFlow, SQLite, Unity, Django, Firebase