JOEY QUINLAN

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EDUCATION

University of Alberta   Sept. 2020 – Dec. 2024
Honors Computing Science, BSc   ***Cumulative GPA**: 3.95/4.0*
Relevant Coursework: Operating Systems, Algorithms & Data Structures, DB Management, Machine Learning, Robotics

WORK EXPERIENCE

Undergraduate Research Assistant | *Python, OpenCV, NumPy, Pandas* | 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
- Delivered in-depth presentations on cutting-edge research to diverse audiences, including industry clients and academic peers, culminating in a presentation at IEEE ISM 2023

Software Engineer Intern | *Python, OpenCV, Django*   May 2022 – Aug. 2022
Promise Robotics   *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 using OpenCV, achieving a precision of 5mm which allowed automatic stud alignment, reducing operation time

EXTRACURRICULARS

Lead Software Developer | *ROS2, C++, Python, Docker* | code   Aug. 2023 – Present
University of Alberta Formula Racing   *Edmonton, AB*
- Leading the development of the UofA Formula Racing Club's first autonomous driving subsystem, mentoring and onboarding new members while coordinating efforts to advance the project
- Building a stereo vision-based perception pipeline using the Stereolabs ZED2i camera and ROS2 wrapper for cone detection and localization
- Containerized our software stacks with Docker to allow for consistent development across operating systems
- Established a continuous integration pipeline with build and linter checks using clang-based tools and ruff/mypy, ensuring code is standardized and follows best practices

Software Developer | *ROS2, Python, OpenCV*   Jan. 2023 – Aug. 2023
University of Alberta Autonomous Robotic Vehicle Project   *Edmonton, AB*
- Collaborated with a team of 7 developers to build a software stack capable of piloting an underwater autonomous vehicle
- Generated 3D bounding boxes using OpenCV, NumPy, and Apriltags for pose detection ground truth data
- 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 ≈ 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

TECHNICAL SKILLS

Languages: Python, C/C++, JavaScript, HTML/CSS, SQL
Technologies: OpenCV, ROS2, Git, Docker, NumPy, Pandas, SQLite, Django