Aidan Reilly

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Experience

Robotics Software Engineer II May 2024 – Present
Komatsu Mining *Pittsburgh, PA*

- Leading the development of a **3D perception stack** for autonomous underground mining vehicles in harsh GPS-denied environments using **ROS2**, deployed on **NVIDIA Jetson**.
- Trained **3D deep learning models** in **PyTorch** (**PointPillars/SECOND**) for LiDAR-based object detection.
- Designed and deployed a real-time pointcloud **segmentation** pipeline to classify structural mine geometry.
- Converted geometric understanding into executable cut targets, enabling fully autonomous **26-cut sequence** execution within operational boundary constraints.
- Implemented **ICP**-based algorithms for extrinsic calibration, plane extraction, and volume/velocity estimation.
- Wrote pointcloud preprocessors for filtering, voxelization, merging, and pointcloud-to-laserscan conversions.
- Integrated and deployed 3D/visual **SLAM** systems (RTAB-Map, VO pipelines) for GPS-denied autonomy.
- Configured and integrated physical **LiDAR, camera, and RADAR**; created ROS2 drivers and wrappers.

Robotics Software Engineer Intern May 2022 – Aug. 2023
Komatsu Mining *Pittsburgh, PA*

- Led various perception and autonomy projects across 3 internships.
- Developed LiDAR-based 3D perception pipelines for object detection and environment understanding.
- Set up **Nav2** navigation stack from scratch and developed custom planners and controllers.
- Configured mapping and localization using **SLAM Toolbox** and **RTAB-Map** for GPS-denied environments.

Teaching Assistant, Discrete Mathematics Aug. 2022 – May 2024
University of Pittsburgh *Pittsburgh, PA*

- Led a weekly recitation for 30 students and held office hours/tutoring sessions.

Education

Georgia Institute of Technology Remote
M.S. Robotics Perception | GPA: 4.0 *Expected 2027*

University of Pittsburgh Pittsburgh, PA
B.S. Computer Science | GPA: 3.7 *2024*

Projects

Indy Autonomous Challenge | *TEAM: Pittsburgh, Carnegie Melon, MIT* June 2022 – Aug. 2023

- Trained camera and LiDAR deep learning models with **PyTorch** for real-time detection of opponent racecars.

Autonomous Navigation Assembly June 2022 – Dec. 2022

- Built end-to-end autonomous navigation system using ROS2, NVIDIA Jetson, LiDAR, and cameras.

Clothing Segmentation Extension | *University of Pittsburgh* Mar. 2023 – Apr. 2023

- Trained a machine learning model for live clothing segmentation and classification as a Chrome Extension.
- Placed 2nd overall in the 2023 SteelHacks Hackathon, winning the "User Experience" category.

Technical Skills

Languages: C++, Python, MATLAB
Deep Learning: PyTorch, CUDA, TensorFlow, PointPillars
3D Computer Vision: Point Cloud Library, Point Cloud Segmentation, 3D Reconstruction, Visual Odometry, SLAM
Frameworks & Simulation: ROS2, Isaac Sim, Docker
Libraries: OpenCV, PCL, NumPy, scikit-learn, Git
Algorithms: ICP, RANSAC, Point Cloud Filtering, Voxelization