Matthew Desaulniers

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Education

Colorado School of Mines — Golden, CO
PhD in Robotics — Aug 2024-Present

Colorado School of Mines — Golden, CO
Masters of Science in Robotics - 3.78/4.0 GPA — Aug. 2020 – May 2022

Florida Polytechnic University — Lakeland, FL
Bachelors of Science in Electrical Engineering - 3.76/4.0 GPA — Jan. 2016 – May 2019

Experience

Embedded Flight Software Engineer — May 2022 – Jan 2024
United Launch Alliance — Centennial, CO

- Participated in launch vehicle subsystem development from planning and scope creation in PDR to presenting finished work in CDR.
- Developed reliable, consistent C++ code to aerospace standards across a wide range of subsystems related to flight computer communication, guidance, navigation, control, actuators, fault detection, etc.
- Created test plans for how to verify software subsystems to accurately meet requirements while taking into account constrained testbed resources.

Transportation Systems R&D Intern - Sensing — April 2021 – March 2022
National Renewable Energy Lab — Golden, CO

- Designed and conducted experiments for object detection in foliage using embedded MIMO radar.
- Prototyped object tracking, estimation (Kalman Filter), and mapping algorithms to test different sensing schemes.
- Created parsers in C++ and Python for UART TLV packet data stream.
- Ran tests with Radar, Lidar, Cameras, and RTK/PPK Differential GNSS units for tracking systems.

Hardware Engineer 1 - Analog — June 2019 – March 2020
Plexus Corp. — Louisville, CO

- Lead design reviews between internal teams and customer for a high-speed computing test device.
- Created schematics (Altium), schematic symbols, footprints, and assisted in layout process.
- Designed circuits and selected parts for new circuits or existing ones with previous part issues.
- Conducted testing for computing and medical board prototypes, identified manufacturing defects that affected expected board function, and altered test plans to appropriately address high risk issues that were unanticipated.

Electrical Engineering Intern — May 2018 – Sep 2018
SOFWERX — Ybor, FL

- Troubleshot and fixed issues related to electrical malfunctions occurring (e.g. electric vehicle malfunctions, shop equipment, power supplies, etc)
- Communicated with customers to ensure that our designs aligned with their requirements and interpreted said requirements into technical specifications

Projects

Autonomous Scooter

- Implemented speed control in ROS.
- Designed hardware and software safety features.
- Designed/Simulated State-Feedback controller using Matlab.

6DOF Robot Arm

- Created a library of Matlab functions relevant to arm control, inverse kinematics, dynamics, rigid-body transformations, and trajectory generation/interpolation.
- Tuned interpolation and trajectory parameters to achieve better path.

ML Vehicle Pose Estimator

- Implemented YOLO detector for vehicle recognition.
- Used OpenCV for preprocessing (masking, grayscale, resizing).
- Created feedforward and CNN networks for estimating orientation and position of vehicles in local coordinate system.