Joseph Lynch

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EDUCATION:

Northeastern University (NU), Boston, MA MS in Robotics — May 2020
Master of Science in Robotics, Concentration in Electrical and Computer Engineering | GPA: 3.92
Honors: Gordon Institute of Engineering Leadership Fellow Candidate
Relevant Coursework: Robotics Sensing & Navigation, Mobile Robotics, Assistive Robotics

University of Pittsburgh (Pitt), Pittsburgh, PA — Apr 2018
Bachelor of Science in Computer Engineering, Minor in Mechanical Engineering | GPA: 3.87
Relevant Coursework: Intro Embedded System Design, System Design on a Mobile Robot Platform, Intro Image Processing

COURSE PROJECTS:

Toyota Human Service Robot (HSR) Tidy Up Challenge – NU Mobile Robotics Course Final Project — Apr 2019
- Adapted motion planning and navigation algorithms for use with Toyota's HSR
- Programmed high level behavior to teach Toyota's HSR to respond to voice commands and tidy up scattered objects

Autonomous Vehicle Kalman Filter – NU Robotics Sensing & Navigation Course Final Project — Apr 2019
- Integrated the Ackermann Steering Model into a Kalman filter to provide state estimation for autonomous vehicles
- Used Northeastern's autonomous vehicle to collect real data and test our algorithm

Swarm Robotics – Pitt Senior Design Project — Dec 2017
- Implemented the Particle Swarm Optimization algorithm to simulate detection of and response to a forest fire
- Developed a computer vision system using ROS to simulate a GPS satellite and provide location data to each robot

WORK EXPERIENCE:

Robotics and Intelligent Vehicles Research Lab, Boston, MA – *Graduate Research Assistant* — Sep 2018 – Present
Fostering Innovation in Seafood Handling (FISH): developing robotic arms for use in sorting and processing seafood
- Wrote **motion planning** software using MoveIt and Trajopt using ROS and C++ for human robot collaboration
- Tested motion planning code in **simulation (Gazebo)** and on real collaborative robots (Universal Robots UR3e)
- Integrated several commercially available soft grippers into the motion planning algorithm to pick up delicate fish

Cold Spray Additive Manufacturing: developing 8-DOF Fanuc industrial robotic system for spraying metal powders
- Lead all aspects of robotic software development from requirements elicitation to architecture design and implementation
- Leveraged laser profile **depth sensor** and point cloud library **(PCL)** to monitor material deposition in real time
- Processed a CAD model to generate a tool path and joint trajectories using **ROS** and **C++** to reduce planning time by 95%

Center for Space High-performance, and Resilient Computing (SHREC), Pittsburgh, PA — Nov 2017-Apr 2018
- Created a low-memory version of existing image conversion app that reduced memory usage by up to 93%
- Developed a **python** GUI for the labeling/classification of satellite images

Human Engineering Research Labs, Pittsburgh, PA – *Embedded Systems Co-op* — Jan 2016 - Jun 2018
Physical Activity Monitoring System (PAMS) for wheel chair users
- Developed firmware for PAMS using **C** code compiled for TI microcontrollers using I^2C, SPI, and Bluetooth protocols
- Designed a case for PAMS PCB using CAD software (**SolidWorks**)

Hydroid Inc, Pocasset, MA - *Software Engineering Intern* — May 2016 – Aug 2016
Developed software for the Vehicle Interface Program (VIP) for Autonomous Underwater Vehicles (AUVs) using C++
- Developed a remote-control interface based on provided documentation that included PID control
- Wrote and carried out detailed software test plans + performed code reviews for other members of the software team

Follett Software Corporation, Hingham, MA - *Software Development Intern* — May 2015 – Dec 2015
Developed software for the web-based Aspen Student Information System primarily using **Java**
- Maintained **unit test** infrastructure for the Aspen product – wrote new tests while fixing and updating existing tests
- Worked within a 5-person **agile** product development team and contributed to daily stand-up meetings

LEADERSHIP + RECOGNITION

Gordon Institute of Engineering Leadership Fellow Candidate, Northeastern University — Sep 2019 – Aug 2020
- Intensive year-long program of hands-on leadership training with a focus on engineering practices
- Lead all aspects of a thesis-level engineering challenge project with the RIVeR Lab

Amazon re:MARS Conference, Las Vegas, NV June 2019
Conference on Machine Learning, Artificial Intelligence, Robotics and Space

- Presented a demo of current NU robotics research over three days of the conference as part of the tech showcase

Pitt Robotics and Automation Society, University of Pittsburgh January 2015 – April 2018
Robotic Panther - *System Integration Team Lead*

- Designed CAD models of eyes, ears and head of the Panther for 3D printing
- Used facial recognition software in Python and Arduino to allow Panther head to track and follow the closest person