Joseph Lynch

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Portfolio website: Joseph-Lynch.github.io | Linkedin: linkedin.com/in/JLynchNU

SKILLS:

C/C++, Python, Matlab – Linux, ROS, Simulation (Gazebo, RVIZ), Hardware integration, Motion planning – Solidworks

EDUCATION:

Northeastern University, Boston, MA — 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, Reinforcement Learning

University of Pittsburgh, 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 Support Robot (HSR) Tidy Up Challenge – 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 – Robotics Sensing & Navigation Course Final Project — Apr 2019
- Integrated the Ackermann Steering Model into a Kalman filter to provide state estimation for autonomous vehicles
- Utilized 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
Cold Spray Additive Manufacturing
- Utilized 8-DOF Fanuc industrial robotic system to produce a part from a CAD model by spraying metal powders
- Leveraged laser profile depth sensor and point cloud library (PCL) to monitor material deposition in real time
- Lead all aspects of robotic software development from requirements elicitation to architecture design and implementation
- Produced a proof-of-concept design using ROS and C++ to reduce planning time by up to 95%

Fostering Innovation in Seafood Handling (FISH)
- Utilized MoveIt and Trajopt libraries to write motion planning software for sorting and processing seafood
- 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

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 93%
- Developed a python GUI for the labeling and 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
- Wrote firmware for PAMS with 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++
- 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
- Maintained and updated unit test infrastructure for the Aspen Student Information System primarily using Java
- Collaborated with 5 people in an 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
- Participated in 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 Cold Spray Additive Manufacturing Lab

Future of Innovation in Aeronautics and Aerospace, Paris, France Nov 2019

- Presented a poster on our research investigating robotic cold spray techniques for applications in the Aeronautics Industry

Advanced Robotics for Manufacturing Institute Conference, Pittsburgh, PA Nov 2019

- Delivered a talk on the results of our project developing robotics to Foster Innovation in Seafood Handling (FISH)

Amazon re:MARS Conference, Las Vegas, NV June 2019

- Presented a demo of current Northeastern 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