Amy Phung

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Education

Olin College of Engineering Needham, MA

B.S. in Engineering:Robotics *Aug. 2017 – May 2021*

- Recipient of 4-year, Olin Merit Tuition Scholarship valued at more than $100,000
- Relevant Coursework: Machine Learning, Discrete Math, Software Design, Fundamentals of Robotics, Computational Introduction to Robotics, Quantitative Engineering Analysis, Data Structures and Algorithms, Principles of Engineering
- GPA: 4.0/4.0

Sea Education Association Woods Hole, MA

Global Oceans Program *Jan. 2020 – March 2020*

- Crewmember and student researcher aboard the SSV *Robert C. Seamans* on an oceanographic research cruise off the coast of New Zealand
- Conducted a comparative study between three different sources of chlorophyll-a measurements: satellites, robotic Biogeochemical Argo floats, and shipborne fluorometers. Published results in a sole-authored conference paper
- Relevant Coursework: Leadership and Communication in a Dynamic Environment, Directed Oceanographic Research

Research Experience

Olin College Senior Consulting Project in Engineering September 2020 – Present

Product Owner *Needham, MA*

- Developed virtual reality (VR) interfaces using Unity and C# for the Monterey Bay Aquarium Research Institute (MBARI) to improve ROV piloting for scientific sampling
- Implemented human-robot interactions in VR with hand gestures, gaze tracking, and foot-based controls
- Coordinated activities and design reviews for a 5-person engineering team
- Maintained team communications with MBARI scientists and engineers through weekly presentations

Olin Ground Robotic Autonomous Vehicle Lab October 2017 – Present

Lead Student Researcher *Needham, MA*

- Developed software for machine learning based obstacle detection and classification in 3D pointclouds. Project was competitively selected as a Finalist in the Panasonic Prototype 3D LiDAR Competition
- Simulated a robotic tractor in Gazebo with ROS integration to augment off-board testing capabilities, reducing iterative test cycle time from a 3-hour field test to 1-hour of debugging in simulation
- Developed algorithms for path planning research related to autonomous dirt road leveling and maintenance
- Designed and implemented the electromechanical three-point hitch subsystem to actuate a road grader
- Established ROS communications between the high and low-level control systems for interfacing with sensors and actuators

Woods Hole Oceanographic Institution June 2020 – September 2020

Summer Student Fellow *Woods Hole, MA*

- Developed a computer vision-based calibration method to characterize sensor-to-angle relationships for 6 degree-of-freedom manipulators without physical operator assistance for use in remote underwater environments
- Implemented method using ROS, C++, and Python for testing with a physical hydrualic manipulator testbed setup

Industry Experience

Relativity Space May 2019 – August 2019
Automation Intern *Inglewood, CA*

- Developed and tested computer vision algorithms and controls to automate high-precision end-effector position adjustments on industrial manipulators in a noisy welding environment. Enabled precise < 0.01 mm adjustments on a robot whose accuracy specifications were ± 0.05 mm
- Increased team bandwidth by reducing frequency of off-hours requests to on-call engineer through aforementioned adjustments
- Ran proof-of-concept tests of software containerization for testing and deployment
- Worked with industrial robot arms on the world's largest metal 3D printer used for constructing rocket tanks

GE Aviation May 2018 – August 2018
Product Support Intern *Lynn, MA*

- Spearheaded development on Rotorcraft Operations Center (ROC), a project that automates the process of pulling and manipulating raw helicopter engine data from a database and applying statistical tools to create virtual dashboards for predictive fleet monitoring
- Tested and developed a python-based webcam mouse with OpenCV to make user-friendly controls for the large ROC display
- Developed custom python-based GUI through rapid iterations based on user input, reduced raw engine dataset analysis time from 2 hours to 5 minutes

Teaching Experience

Olin College Machine Shop October 2017 – Present
Rapid Prototyping Student Instructor *Olin College*

- Maintained, repaired, and recalibrated FDM and SLA 3D printers used by 50% of the student population
- Trained students and faculty to use the 3D printing space
- Assisted users with CAD and troubleshooting 3D printing problems
- Automated community hardware restock process by creating a user-friendly webapp

Modeling and Simulation in Python August 2018 – December 2018
Course Assistant *Olin College*

- Evaluated homework and held office hours to ensure students understood quantitative modeling concepts and implementation of models in Python
- Facilitated project feedback discussions

Publications

A. Phung, "A comparison of Biogeochemical Argo sensors, remote sensing systems, and shipborne field fluorometers to measure Chlorophyll-A concentrations in the Pacific Ocean off the northern coast of New Zealand", OCEANS 2020 MTS/IEEE Singapore-U.S. Gulf Coast (Accepted).

Technical Skills

Languages: Python, C++, C#, MATLAB, HTML/CSS, LaTeX
Developer Tools: ROS, Gazebo, DDS, Git, TravisCI, Docker, Unity
Libraries: OpenCV, Pandas, NumPy, Matplotlib, SciPy
Mechanical: Rapid Prototyping, SolidWorks, OnShape, FDM & SLA 3D Printing