Shaun **Fedrick**
Robotics Software Engineer

linkedin.com/in/shaun-fedrick-0b2069144
github.com/sfedrick Portfolio
+1 954 440 8279 shaunclfedrick@gmail.com
NYC Metropolitan area Authorized to work in the U.S
www.shaunfedrick.com

Professional Experience

current – Jan 2022 | **Mechatronics Engineer | Motion Planning and Controls , ASML, Wilton,Ct**

Currently I work to implement robotic (Controls, Machine learning, Kinematics, and Computer vision) software and hardware changes onto a 6 dof, precision, robotic reticle stage. This involves writing software in matlab and python for a 6 dof robotic reticle stage to simulate the new feature. I then implement the function onto a fleet of stages within a cross sectoral team.

- Developed a Slam algorithm to map disturbance at any given point within the Reticle stage's work space and then determine and predict necessary FF command given to the reticle stage based on that estimated location. Location was determined using differential sensors fused using a Kalman filter. Code was developed and written in a combination of Matlab and Python.
- Designed, developed, and tested a software algorithm to optimize pretension values for pull only actuators and to optimize controller parameters using a MIL (machine in the loop) approach.
- Refactored a code base designed to simulate the dynamics of a 6 dof robotic reticle stage. Transfered this code base into a modern version control system (git) to aid software collaboration and tracking.
- Created a motion planning application that utilized multithreading to position the 6 dof reticle stage into several desired positions .
- Lead the development of two new mechatronic tools that will enable automatic testing of electronics,hardware, and control methodologies of a 6 dof robotic reticle stage.

robotics | controls | Data Analysis | Simulation | Matlab | Python | C++ | Linear Algebra | Statistics | Agile

Dec 2021 – May 2021 | **GRASP Lab | Graduate Student Researcher (Robotics) , University of Pennsylvania, Pennsylvania**

I used a phase change material coupled with a heated insert to create a latching mechanism to add directionality to an origami robot. I then designed and implemented a controller in C++ that ran on a micro controller in real time to control the mechanism .

- Designed and optimized a nonlinear controller using Matlab and Python
- Created a simulation and optimization of a mechanical Design of the latch insert using Python.
- Wrote a controller in C++ to control the latching mechanism.
- See DOI:10.1109/ICRA40945.2020.9196534 for more information on the robot.

C++ | Python | Controls | Rapid Prototyping | Git | Docker | Data Analysis | Robotics

May 2020 – December 2018 | **Fluid dynamic research | Student Researcher, Haverford College and University of Pennsylvania, Pennsylvania**

I worked in collaboration with University of Pennsylvania and Haverford College to investigate the way Non-Newtonian effects impacted lubrication forces within a fluid.

- Analyzed and tracked mechanics of a sphere moving through a fluid using OpenCV

Matlab | OpenCV | Python | Solid Works | Java | Computational Physics | Computer Vision | Rapid Prototyping

May 2019 – December 2016 | **Digital Scholarship | Website designer, Haverford College, Pennsylvania**

I worked on https://archivogam.haverford.edu/en/, a website designed to connect persons illegally detained and forcibly disappeared in Guatemala during the Civil War with friends and relatives.

- Wrote the front and back end of Home and Images Section of Archivo Gam
- Implemented a panning zoom feature and a person search feature.

Python | Linux | Django | git | command line

Education

December 2021 – January 2020 | **University of Pennsylvania | Mechatronics and Robotic Systems , (Masters of Science in Engineering), Philly,PA**

- Mechatronic and Robotics engineering master's student.

Robotics | Mechatronics | Controls | Machine Learning | Computer vision | Electrical design | Sensors

December 2020 – August 2016 | **Haverford College| Physics , B.S, Haverford,PA**

- Fluid dynamic research; Thesis : Touch Down of a Sphere in Viscoelastic Media

Physics | Math | Dynamics | Mechanics | Computational Physics | Coding | Problem Solving | Expirementation