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.

- Designed, developed, and tested a software algorithm that used neural networks and optimization techniques to optimize motor control parameters for reluctance actuators given robotic force data. Data was collected using a HIL (hardware 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) from svn to aid software collaboration and tracking.
- Designed, developed, and tested a software algorithm that used the kinematics of a robotic stage to prevent thermal stresses from damaging the motors.
- Created a motion planning application in python that abstracted away positioning the 6 dof reticle stage into several desired positions.

Robotics | controls | Machine Learning | Data Analysis | Tensor flow | Pytorch | Scipy | Simulation | 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 ILC (Iterative Learning Control) in Python
- wrote a monte carlo application in python to pick design parameters for an origami robot.
- 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.

- Used Python to perform data analysis on real word data to determine the dynamics of a complex non-newtonian fluid system.
- Analyzed and tracked mechanics of a sphere moving through a fluid using OpenCV.

OpenCV | Python | 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 using django.
- 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 | Expiremental