

Shaun FEDRICK

Mechatronics Design Engineer/ASML

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PROFESSIONAL EXPERIENCE

current
Jan 2022

Mechatronics Design Engineer | Motion Planning and Controls , ASML, Wilton,Ct

Currently I work to implement robotic (Controls, Machine learning, Kinematics, and Computer vision) software and functional changes onto a 6 dof precision robotic stage. This involves writing software in matlab, python and C++ for a 6dof robot. I then implement the function onto the fleet within a cross sectoral team.

- > Used numerical optimization techniques to optimize pretension values for pull only actuators and to optimize controller parameters given frequency response data.
- > Created a LSTM neural network that will be used to predict robotic actuation.
- > Created a motion planning application that utilized multithreading to position the robotic stage into several desired positions .
- > Lead the development of two new robotic tools that will enable automatic testing of electronics, hardware, and control methodologies of our new robot.
- > Designed, developed, and tested a software algorithm in C++ and Matlab to keep motor coils warm while preventing movement of the robot in order to minimize thermal stresses due to bonding layers undergoing a phase transition.

C++ robotics controls Data Analysis Simulation Pytorch Tensor Flow Matlab Linear Algebra Statistics
Machine Learning 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

Fluid dynamic research | Student Researcher, HAVERFORD COLLEGE AND UNIVERSITY OF PENNSYLVANIA, Pennsylvania

December 2018

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
- > Programmed a testing instrument to collect force measurements of a probe being moved at a constant velocity through viscoelastic fluid

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

May 2019

Digital Scholarship | Website designer, HAVERFORD COLLEGE, Pennsylvania

December 2016

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 Archivogam
- > Implemented a panning zoom feature and a person search feature

Python Linux Django git command line Docker

EDUCATION

December 2021

University of Pennsylvania | Mechatronics and Robotic Systems , (MASTERS OF SCIENCE IN ENGINEERING), Philly,PA

January 2020

- > Mechatronic and Robotics engineering master's student.

Robotics Mechatronics Controls Machine Learning Computer vision Electrical design Sensors

December 2020

Haverford College| Physics , B.S, Haverford,PA

August 2016

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

Physics Math Dynamics Mechanics Computational Physics Coding Problem Solving Experimentation