Frederick Wachter

3601 Powelton Avenue, Unit B6
Philadelphia, PA 19104

faw28@drexel.edu | +1 (610) 517-0948 | fwachter.github.io | github.com/FWachter

Professional Profile

I am a **Robotics Engineer** with a background in mechanical engineering and over two years of professional and academic experience. My primary experience is combining software and hardware for developing robotic platforms. I also have experience full-cycle design, integration, and testing for **platform development** for ground, aerial, and maritime vehicles. I have taken **multiple leadership roles** in teams ranging from 4 to 100 student and professional members have experience in project management, product development, sponsorship, and website development.

Education

Master's and Bachelor's of Science in Mechanical Engineering
Drexel University, Pennoni Honors College | Anticipated Graduation: June 2018
GPA: 3.92 | *Focus in Controls & Systems*

Engineering Work Experience

Lockheed Martin Robotics and Intelligent Systems Group – *Robotics Engineer Intern*
Cherry Hill, New Jersey | March 2017 to September 2017 | *Advanced Technologies Lab*
- Robotic platform developer for unmanned maritime and aerial vehicles
- Performed full system design, development, and integration
- Developed vehicle autonomy framework, software and controls in ROS framework

Autonomous Systems Laboratory – *Robotics and Development Engineer Intern*
Zürich, Switzerland | March 2016 to September 2016 | *Swiss Fed. Inst. of Tech. (ETHZ)*
- Interfaced ABB YuMi with MoveIt! software in ROS C++ to automate kinematic and dynamic model and to integrate existing algorithms for path planning and controls
- Integrated the Leap Motion and VI sensor with YuMi for interactive manipulation
- Developed a stand and a new attachment for YuMi to integrate a VI sensor
- Presented work to the President of ABB Switzerland and his colleagues

Production Technology West – *Research Engineer Intern*
Trollhättan, Sweden | September 2014 to March 2015 | *University West*
- Developed algorithms to determine robustness of weld defect detection from an IR camera with various light sources
- Built a GUI in MATLAB to interface with algorithms to display defect locations to user
- Developed tests to image defects on welds using an IR camera with various light sources in order to benchmark the defect detection algorithms
- Designed and built a borescope for an IR camera to image welds inside of vanes

Engineering and Leadership Experience

Swerve Robotic Platform – *Project Manager, Software & Robotics Head, Webmaster*
Drexel University | July 2017 to Present
- Working with two mechanical one computer engineer to design a highly nimble, high speed, ROS-enabled robot targeted for manufacturing and entertainment industries
- Developing full physics simulation of platform with simulated sensors in Gazebo
- Implementing Kalman Filter for state estimation and MPC for local planner
- Building software architecture within ROS framework

ASME Student Design Competition – *Project Manager and Hardware/Software Head*
Drexel University | October 2017 to Present
- Major tasks include selecting hardware, making electrical layout, designing and implementing software, set up and execute meetings, and raising funds
- Running bi-weekly workshops to teach team members about robot design process

Drexel Hyperloop Team – *Project Manager, Sponsorship Head, Steering Committee*
Drexel University | June 2015 to January 2017
- Interfaced between subsystem teams, university advisors, university staff, and sponsors in order to manage team resources and keep the project on schedule
- Developed organizational structure, grew team of 5 to over 100 students
- Raised over $65,000 as sponsorship head for developing a scaled pod prototype

Skills

Robotics
ROS (Robot Operating System)
ABB Industrial Robots
Robot Dynamics and Control
Embedded Systems
Software Development
Full-Cycle Design/Integration/Testing

Programming
MATLAB
HTML/CSS
C++
Python
JavaScript
RAPID
Bash
LaTeX

Software
ProE/Creo
SolidWorks
Microsoft Office

Manufacturing
3D Printing
Auto Lathe
Milling
Power and Hand Tools

Electrical
Soldering
Wiring (crimping, layouts, etc.)

Languages
French (Working Proficiency)

Standards and Practices

Programming
Google C++ Style Guide
ROS C++ Style Guide

Non-required Coursework

Graduate
Probability & Random Variables
Advanced Programming Techniques

Undergraduate
Micro-Based Control Systems
Numerical Analysis I
Computer Programming I
Basic Robotic Simulation