

# 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

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A **Robotics Engineer** with a background in mechanical engineering and over a year of professional and academic experience with **ROS**. I have experience with full-cycle design, integration, and testing for **platform development** for ground, aerial, and maritime vehicles. I have also taken **multiple leadership roles** in teams ranging from 4 to 100 student and professional members along with experience with project management, product development, sponsorship, and website development.

## Education

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### 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

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### 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

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### 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

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### 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

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### Programming

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

## Non-required Coursework

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### Graduate

Probability & Random Variables  
Advanced Programming Techniques

### Undergraduate

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