

# Frederick Wachter | 205 N 36<sup>th</sup> Street, Apt. 2M Philadelphia, PA 19104

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## Education

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### Bachelor's and Master's of Science in Mechanical Engineering

Drexel University, Pennoni Honors College | Anticipated Graduation: June 2018

Undergraduate GPA: 3.92 | Graduate GPA: 3.89 | *Focus in Controls & Systems*

## Engineering Work Experience

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### Autonomous Systems Laboratory – Robotics and Development Engineer

Zürich, Switzerland | March 2016 to September 2016 | *Swiss Federal Institute of Technology*

- 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 sensor with YuMi in C++ for interactive manipulation
- Worked with machine shop to develop a stand and a new attachment for YuMi
- Presented work to the President of ABB Switzerland and his colleagues

### Production Technology West – Research Engineer

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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### Drexel Hyperloop Team – Project Manager, Sponsorship Head, Steering Committee

Drexel University | June 2015 to Present

- Interfaced between subsystems as project manager to develop project schedule, deadlines, and manage team resources to keep the project on track for competition
- Interfaced between university advisors, university staff, and sponsors
- Developed organizational structure, grew team of 5 to over 100 students
- Raised over \$65,000 as sponsorship head for developing a scaled pod prototype

### Micromouse Competition – Small mobile robotics maze competition

Drexel University | June 2016 to Present

- Developed GUI integrated with the A\* algorithm for solving mazes as a global planner

### THOR Mobile Robot – Three Omni-Wheeled Robot

Drexel University | March 2015 to September 2015

- Developed controller for three omni-wheeled robot using an Arduino
- Used PID, interrupts, SMA, remote radio, and sensor feedback

### 2D Mapping Mobile Robot – Freshman Design Project

Drexel University | March 2014 to June 2014

- Designed PCB, controller in Arduino, 3D printed base, fused sensor data in ArduinoC
- Worked with encoders, accelerometer/gyroscope, XBee, NAND gates, and H-Bridge

## Extracurricular Activities

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### Drexel Space Systems Laboratory – Developed lab website and advise projects running in the lab

Lab Manager and Webmaster | Spring 2015 to Present

### American Society of Mechanical Engineers – Worked with the committee to plan events and tours of local companies

Executive Board Member and previous Vice Chair | Fall 2013 to Present

## Honors and Awards

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### Paul Peck Scholar – Mentoring incoming freshman in engineering and taking specialized courses in leadership

Drexel University | September 2016 to Present

### Hess Honors Research Scholar – Developed orbital trajectories in MATLAB for attitude control of CubeSat's

Drexel University | December 2015 to March 2016

## Skills

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### Robotics

ROS (Robot Operating System)

ABB Industrial Robots

Arduino

### Programming

MATLAB (Proficient)

HTML/CSS (Proficient)

C++ (Working Proficiency)

JavaScript (Working Proficiency)

RAPID (Working Proficiency)

Bash (Working Proficiency)

Java (Limited Working Prof.)

### Software

ProE/Creo (Working Prof.)

SolidWorks (Working Prof.)

Microsoft Office (Proficient)

### Manufacturing

3D Printing (Proficient)

### Languages

English

French (Working Proficiency)

## Specialized Courses

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### Graduate

Eng. Analysis & Methods I

Aircraft Flight Dyn. & Control I

Non-Linear Controls I

### Undergraduate

Intro. to Robotics (Stanford)

Machine Learning (Stanford)

Mechanics of Materials II

Numerical Analysis I

Computer Programming I

Basic Robotic Simulation

Leadership

Mentorship