# Frederick Wachter

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## Education

**Bachelor's and Master's of Science in Mechanical Engineering** – Minor in Mathematics
Drexel University, Pennoni Honors College | Anticipated Graduation: June 2018
Undergraduate GPA: 3.94 | Graduate GPA: 3.95 | *Focus in Controls & Systems*

## Engineering Work Experience

**Lockheed Martin Advanced Technologies Laboratory** – *Robotics Engineer*
Cherry Hill, New Jersey | March 2017 to September 2017 | *Emerging Technologies Lab*

- Robotic platform developer for unmanned maritime and aerial vehicles
- Performed full system design, development, and integration
- Performed software developments and controls in ROS framework

**Autonomous Systems Laboratory** – *Robotics and Development Engineer*
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
- 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

**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

- Working with a mechanical and computer engineer along with a professor in mechanical engineering to develop a fully custom robot and controls system to autonomously move the robot through a maze for a grand prize of $2,000
- Developed the simulation of the robot in a maze in MATLAB as a visualization tool for testing mapping and maze solving algorithms for further optimization of algorithms

**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

## Extracurricular Activities

**Drexel Space Systems Laboratory** – *Developed lab website and current lab manager*
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*
Vice Chair and Member | Fall 2013 to Present

## Skills

**Robotics**
ROS (Robot Operating System)
ABB Industrial Robots
Embedded Systems

**Programming**
MATLAB (Proficient)
HTML/CSS (Proficient)
C++ (Working Proficiency)
Python (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)

## Standards and Practices

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

## Specialized Courses

**Graduate**
Aircraft Flight Dyn. & Control I
Non-Linear Controls I

**Undergraduate**
Mechanics of Materials II
Numerical Analysis I
Computer Programming I
Basic Robotic Simulation
Leadership
Mentorship