

Frederick Wachter

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Professional Profile

I am a **Robotics Engineer** with a background in mechanical engineering and over two years of professional and academic work experience. Most of my work and project experience has involved combining software and hardware for developing robotic platforms. I also have experience full-cycle design, integration, and testing with ground and maritime robotic platforms. 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 | Graduated: June 2018

Cumulative 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 December 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
- Ranked #1 senior design capstone project in Drexel University College of Engineering

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