

Justin Carrus

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EDUCATION

MIT

**S.M. MECHANICAL
ENGINEERING**
June 2018
Cambridge, MA
GPA: 5.0/5.0

MIT

**S.B. MECHANICAL
AND OCEAN
ENGINEERING**
June 2017
Cambridge, MA
GPA: 5.0/5.0

SKILLS

- Systems Arch.
- Machine Design
- Product Design
- Solid Modeling
- Simulation
- Embedded SW
- Serverless Web

PORTFOLIO

Online at jcarrus.com

EXPERIENCE

TULIP INTERFACES | PROJECT LEAD

Summer 2018 — Present | Cambridge, MA

Lead project work including **mechanical design and manufacturing** for production hardware, **backend infrastructure** for an eCommerce and fulfillment system, and **Yocto Linux** firmware development.

MIT PRECISION ENGINEERING RESEARCH GROUP | GRADUATE RESEARCHER

Fall 2017 — Spring 2018 | Cambridge, MA

Designed **medical devices** for orthopedic surgery and medical imaging. Partnered with **clinicians** to determine functional requirements and establish high-level goals. Drove development from concept phase to **working prototype** with functional validation. Additional work in **developing world** technology and **disaster relief** resulting in a pending patent application.

ULTRASONIC GESTURE SENSOR | SYSTEM INTEGRATOR

Spring 2018 | Cambridge, MA

Developed a **benchtop sensor system** for detecting hovering hand gestures through reflection based **system identification**. A stochastic signal was used as input and Fourier techniques were used for system deconvolution.

AUTONOMOUS SAILBOAT | TECHNICAL LEAD

Spring 2017 | Cambridge, MA

Led a **team of 8** that designed and built a 600lb SWATH-hulled autonomous boat for station-keeping in the **open ocean**. Controllable-pitch propellers allowed for **thrust vectoring** and a vertical-axis wind turbine served as the prime mover. The success of the project led to a **\$50k grant** from the US Navy.

MIT PRECISION ENGINEERING RESEARCH GROUP | RESEARCHER

Fall 2016 | Cambridge, MA

Designed and built an instrumented 1:150 scale model of an offshore floating wind turbine for Froude model testing. **Modular, waterproof design** allowed for IMU placement at still water line and center of buoyancy. Product delivered on-time and **far under budget** using simple breakout boards with custom firmware 1/10th the cost of traditional DAQ hardware. The model was used to validate **two PhD Thesis** projects over two weeks of tow tank testing.

MIT FORMULA SAE | TESTING AND DEVELOPMENT LEAD

Fall 2013 — Spring 2016 | Cambridge, MA

Lead **vehicle-level testing and development** projects such as **data acquisition** and vehicle-level **validation** for a team that designs and builds an all-electric, Formula style race car. Additionally, designed and manufactured **anti-roll bars** and **suspension rockers**.

FIAT-CHRYSLER AUTOMOBILES | SUMMER INTERN

Summer 2015 | Auburn Hills, MI

Vehicle-level mechanical and electrical validation for Jeep Grand Cherokee SRT. Developed and validated a **quasi-static track simulation** for estimating lap times. Managed track-day **testing and data collection** as well as data analysis.

FORD SILICON VALLEY LAB | SUMMER INTERN

Summer 2014 | Palo Alto, CA

Designed an electronic system for bicycles from **initial concept development to final product**, the InfoCycle, **released at CES 2015**. **Physical and electronic design, PCB manufacturing, firmware design** and implementation in C, and the design of a supporting web app. In the 12 weeks, was personally involved in **3 Ford invention disclosures** and **1 patent**.