**Local Address:** Foster D. Collins **Permanent Address**

 3901 Locust Walk MB 329 1088 Novara St.

 Philadelphia, PA 19104 San Diego, CA 92107

(619) 947-1505 **Project Portfolio:** [www.fosterdcollins.weebly.com](file:///F%3A%5CHDD%20Documents%5CSchool%5CMISC%5Cwww.fosterdcollins.weebly.com) fcollins@seas.upenn.edu

**Education:** University of Pennsylvania, School of Engineering and Applied Science, Philadelphia, PA **GPA: 3.86/4.00**

 **Degree Expected:** Bachelor of Science in Mechanical Engineering and Applied Mechanics **(Spring 2016)**

Masters of Science in Robotics **(Fall 2016)**

**Engineering**

**Experience: Internship, SPAWAR Systems Center - San Diego, CA Summer 2015**

Modified a jet ski to navigate autonomously, with servo motors on the throttle and steering. Prototyped and packaged the electronics to allow for GPS navigation to waypoints set in Google Earth. Wrote C++ ROS (robot operating system) Nodes on the Linux based BeagleBoneBlack micro-computer. Conducted sea-tests of 5 nm courses at >20 kts.

**Active Secret clearance until June 2016**

**Penn Electric Racing** Student Club at Penn **Fall 2012 – Present**

*Second Car (Fall 2014-Present:* Power Train Captain: Designing, packaging, and manufacturing the electric motor, differential, brakes, chain drive, and drive shafts on the national champion EV Car with a 0-60 time of 3.0 seconds.

*First Car (2012-Summer 2014): O*ne of the primary mechanical designers for the car. Designed and fabricated pedal box (~20 parts) and steering components. Performed other mechanical fabrication tasks including CNC turning drive spindles, composite body, and final car assembly and wiring.

**ModLab UPenn Summer Research** Rachleff Scholars Program S**pring 2014-Spring 2015**

*Spiral Zipper Project:* Designed and built 3 prototypes for a novel large extension ratio column for use on a long-range, heavy-lift robotic arm. The concept is currently being patented by the lab.

*S.M.O.R.E.S. Mechanical Team:* Headed the fabrication of 6 new modules for a modular robot concept. Created GCode for and advised two other undergraduates in the machine shop. Sourced batteries and packaged electronics.

**SeaBotix Inc.** San Diego, CA: **Summers 2011-2013**

*Mechanical Engineering Intern: (2012, 2013)* Supported development of a new product, producing full engineering and assembly drawings for prototype and production releases. Handled engineering changes and improvements in SolidWorks. Developed CAD concepts for a new ROV vehicle configuration.

*Sustaining Engineering Intern: (2011)* Developed work instructions and made CAD files for undocumented products.

**FIRST FRC Robotics Alumni/Mentor** Team 2485, San Diego, CA **Fall 2008-Present**

*Student Member (Team Captain):* 2008-2012 (2011-2012) Served as the team’s primary mechanical designer and fabricator (2009-2012). Taught myself CAM, CNC Machining, MIG Welding, and Carbon fiber layups to advance the abilities of the team.

*Mentor:* (2012-Present) Ran 6 SolidWorks Seminars in 2013 and 2015. Help advise the team during the build season while at home for winter break and then mentor SolidWorks CAD design remotely from school.

**Design**

**Projects: Robot Hockey:** *Design of Mechatronic Systems (MEAM 510)*  **Fall 2014**

Designed and built 3 small mobile robots in 4 weeks with a team of 4 others to play a modified form of hockey autonomously for the annual completion at Penn. I did the mechanical design of the two identical primary robots as well as the majority of the 2000 lines of code and libraries written in C to run the robots. Out of the class of 100 students and 24 other teams made up both undergraduate, graduate, and PhD students, our team finished in 2nd place.

 **Stirling Engine:** *Machine Design and Manufacturing (MEAM 201)* **Spring 2013**

Designed and machined a Gamma Type Stirling Heat Engine. With over 30 custom components, the flywheel was a counter rotating planetary gear set, and ran at over 1000 rpm

**Vertical Axis Wind Turbine:** *Mechanical Engineering Design Laboratory II (MEAM 347)* **Fall 2014**

Designed and built a 5 ft. tall lift based (Darrieus) VAWT. Conducted small scale tests in a wind tunnel and completed dimensional analysis to determine the expected output, and operating conditions at full scale.

**Skills:** SolidWorks (8 yr. experience), SolidWorks FEA, Femap, SolidCAM, Mill & Lathe (CNC/Manual), Mechatronics, MATLAB, Java, C/C++, ROS, AVR/Arduino Microcontrollers, Laser Cutting, MIG Welding, Composite Layup

**Awards &**

**Involvement:** **Eagle Scout** (2011) Troop 959, San Diego, CA

**Dean’s List:** *2012-13, 2013-14, 2014-15,* University of Pennsylvania

 **TA for Mechanical Design 101** *2013-2014* Teaching lab sections of 20 CAD Design and engineering best practices

 **Rachelff Scholars Program** *Fall 2013* *- Present*

 **Dr Douglass C. Crone Head of School Award** *2012,* Francis Parker High School

 **Penn Sailing Team**  *Fall 2012 – Present,* Race Crew