

# Justin Fortner

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Github: [github.com/justinfortner/UCSC.git](https://github.com/justinfortner/UCSC.git)

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## EDUCATION

### University of California Santa Cruz — BS in Computer Engineering : Robotics & Control Concentration

September 2015 - December 2019

## EXPERIENCE

### Head Beach Volleyball Coach — Mountain View Volleyball Club, Mountain View, CA

May 2019 - August 2019

Technical - Created an automated system capable of pulling information from a google form, creating a schedule and keeping track of attendance for drop in sessions of all players in the program using. This was accomplished through google forms, google sheets and custom macros for the sheets.

Coaching - Coached several girls beach volleyball teams of various skill levels and ages.

### Mechanical & Network Engineering Intern — Fortner Engineering, Glendale, CA

June 2015 - September 2015 & June 2016 - September 2016

Mechanical - Created 30 specialized tools used to dismantle and assemble hundreds of unique precision made airplane parts for companies such as Southwest, United, FedEx, UPS, Ect. Schematics for these tools were created in AutoCAD and used by machinists to create the tools out of steel.

Networking - Set up an easily scalable physical internal network that allows 50+ workers to electronically access a central database of manuals, forms, spreadsheets and other miscellaneous files. As of 2020 this network is still in use and has been scaled to fit the now 80+ workers within the company.

## RELEVANT COURSEWORK

### Robotics

- Mechatronics
- Bio-Inspired Locomotion
- Feedback & Control Systems
- Signals & Systems
- Electronic Circuits

### Programming

- Computer Systems
- Assembly Language
- C Programming
- Algorithms
- Data Structures & Types

### Hardware

- Computer Architecture
- Electronic Circuits
- Microprocessor System Design

## SKILLS

### Programming Languages

- OOP
  - Java
  - C/C++/C#
- Web Development
  - HTML
  - CSS
- Scripting
  - MATLAB
- Hardware
  - Verilog

### Robotics Programming Frameworks

- Arduino

### CAD Programs

- Fusion360
- AutoCAD
- Solidworks

## PROJECT HIGHLIGHTS

### **Mechatronics Final Project - <https://bit.ly/2TF8vUP>**

This project, as shown in the video link above, combines arduino hardware, custom built sensors, C programming and laser cut materials to produce a fully autonomous robot to deposit a ping pong ball inside of a correct hole within a beacon tower. A state machine coded in C software allowed the arduino hardware to communicate with the many custom build sensors. This robot was able to use an IR signal sensor to lock onto desired "towers", bumper sensors to signal arrival at the tower and easy circumnavigation, tank circuits to read the correct wire signal emitted by the wall and a tape sensor to locate the correct hole in which to deposit a ping pong ball. This project was the collaborative effort of myself and two other classmates. We were able to complete this project quickly and effectively through hard work and communication.

### **Soft Robotic Jellyfish Research Paper**

This paper takes inspiration from a jellyfish bell in order to create a battery powered and autonomous bio-inspired soft robot. A jellyfish was chosen due to its combination of speed and efficiency. This is due to the natural aerodynamics of the jellyfish as well as their use of a toroidal vortex. In addition to the swimming characteristics of a jellyfish, the animal is also naturally soft and flexible allowing for an easy translation of the jellyfish kinematics to soft robot. A soft robot was chosen because the final intention of this robot is to aid marine researchers in their studies of fragile ecosystems such as coral reefs.

### **Terrastep - IDEA Hub 2019 Pitch for Social and Creative Enterprise 1st Place Winner**

A team of engineers and I created a battery powered, portable prosthetic wearable capable of alerting the user if they were to take an abnormal step that may cause them harm. This is accomplished through the analysis of data collected by sensors in a shoe insert. The feedback of this data is then given to the user through the use of vibrational feedback in a comfortable band on the users thigh. This feedback has two specific modes. The first being a continuous feedback. In this mode light vibrations are given to the user so they are aware of the system. The second mode being an alert mode. This interrupts the continuous feedback mode on detection of hazardous step. High intensity vibration feedback is then given to alert the user to adjust their footing. Thus greatly reducing the risk of injury. I lead the mechanical engineering team in creating custom sensing arrays as well as custom micro controller and battery housings. I also assisted out lead software engineer in creating the algorithm behind analyzing the data from the sensors and detecting a hazardous step. This project was created during the fast paced senior design project course.

## REFERENCES

**Dr. George Hurtarte** - Interim  
Professor at the University of  
California Santa Cruz

- [jhurtart@ucsc.edu](mailto:jhurtart@ucsc.edu)

**Professor Mircea Teodorescu**  
- Professor at the University of  
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**Lake Merchen** - Mountain View  
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