

# KENJI BOWERS

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Recently graduated Mechanical Engineer holding a Master of Science degree from Stanford University with strong electro-mechanical design skills. A passionate self-directed learner who can do everything from design and manufacture mechanisms, to program embedded microprocessors. Seeking to get involved with a great robotics team and use my design, development, and manufacturing skills to help bring next generation robots to market.

## EDUCATION & SKILLS

### Stanford University

Stanford, CA

Master of Science in Mechanical Engineering: Mechatronics specialization (GPA 3.65)

September 2014 – December 2015

Bachelor of Science in Mechanical Engineering (GPA 3.87)

September 2010 – June 2014

- **Notable Coursework:** Machine Design, Internal Combustion Engines, Vehicle Dynamics, Mechatronics, Programming in C++, Systems in C, Robot Control, CNC Machining, Mathematical Methods for Robotics and Vision, Digital Image Processing, Electronics, Linear Algebra, Design and Manufacturing, Fluid dynamics, Thermodynamics

**Digital Design Skills:** Additive manufacturing, Rapid prototyping, CNC machining, CAD (Solidworks), CAM, Circuit design (Altium Designer), Laser cutting, Waterjet, Electric motor selection/characterization/tuning, Electro-mechanical debugging

**Analog Design Skills:** Machine shop skills, TIG welding, Carbon fiber composites work, Mold design, Design for manufacturability, Brainstorming, Need finding, Team design reviews, Concept sketching, Woodshop skills

**Software Development Skills:** Embedded C for ARM Cortex, Python, Linux Environments, Matlab, C, C++, Java, HTML, CSS, Arduino

## PROFESSIONAL EXPERIENCE

### Stanford University

Stanford, CA

Teaching Assistant for Professor Christopher Gerdes

September 2014 – June 2015

- Suggested, lead, and executed the integration of consumer grade 3D printers into the capstone Machine Design class. Designed and printed the parts needed to use off-the-shelf hobby motors with the Lego ecosystem for this class's motor powered Lego Crawler project. In addition to substantially cutting costs, this alternative to using the pre-gearred Lego motors forced students to design transmissions with higher reduction ratios and greater gear counts, which increased class comprehension levels. (Fall and winter) Mentored a group of undergraduate students in an effort to make an MRI safe driving simulator controller that mimics the actual driving experience. (Spring)

### Intuitive Surgical Inc.

Sunnyvale, CA

Instruments and Accessories Manufacturing Intern

June 2013 – August 2013

- Developed an automatic manufacturing station that used pneumatic cylinders to securely attach and detach a manufacturing aid to a surgical instrument. This drastically reduced tack time and human error by automating a worker's task. Designed, prototyped, tested, made drawings, and sent parts out for machining. Asked to return summer of 2014.

### Renovo Motors Inc. (High performance electric vehicle startup)

Campbell & Gilroy, CA

Mechanical Engineering Intern specializing in Composites

June 2012 – August 2012

- Designed and manufactured carbon fiber parts using vacuum resin infusion. Began by wiring 480V 3 phase into a shop, brought a used CNC router online, milled the plug out of MDF, finished the plug by priming and sanding, created the mold with fiberglass and tool coat, and manufactured the carbon parts from the mold. Asked to return during the 2012 – 2013 school year and summer of 2013.

## RELEVANT PROJECTS

### Vision Guided Watering Robot

SF Bay Area, CA

Developing a precision irrigation robot: Waterbot

January 2016 – July 2016

- Designed and developed a vision-guided robot, which precisely dispenses water from the end effector of its 2 degree of freedom SCARA arm. Waterbot is a camera enabled connected device allowing only remote plant watering at the moment but will have autonomous control in the near future. The robot is almost entirely 3D printed and is powered by a Raspberry Pi and an ARM Cortex microprocessor. See website for video.

### Autonomous Racing Go Kart

Palo Alto, CA

Team project for Mechatronics Class ME218B

January 2015 – March 2015

- Worked on a team of four to build an autonomous Go Kart from the ground up using the TIVA Launchpad ARM Cortex board. Personally designed the drive train of the Kart using Legos and 3D printed parts: laser cut encoder wheels for each driven wheel, built and tested the optical encoder circuitry, and implemented and tuned PID position and speed control in embedded C.

### Delta 3D Printer

Palo Alto, CA

Building my own FDM Printer: Icarus

September 2013 – September 2014

- Designed and built my own 3D printer when I wanted one but could not afford one. Things that set my printer Icarus apart from other RepRap builds: zero-backlash magnetic ball and socket joints, huge 17" diameter circular base by 17" height cylindrical build volume, rigid waterjet and milled all aluminum construction, low mass end effector with Bondtech dual drive gear Bowden extruder, and an open source 100Mhz Smoothieboard. These features combine to make Icarus one of the fastest high quality large FDM printers out there. Media on personal website.

### CNC Machined Indoor Train

Palo Alto, CA

In-room service robot created for CNC Machining Class ME318

January 2014 – April 2014

- Designed and machined an indoor service robot concept for the CNC machining class. Milled a large aluminum block down to a one-millimeter shell for the train chassis, added a brushless drive motor with a custom transmission to power the train, and rode it on an 80-20 style aluminum extrusion. The robot has a dovetailed slot milled on its face, allowing it to hold all sorts of "tools" which could be anything from cup holders to small robotic arms.