

A scenic sunset over the ocean, framed by the dark silhouette of a large tree in the foreground. The sky transitions from a deep blue at the top to a bright orange and yellow near the horizon. The ocean is calm with gentle waves, and a small boat is visible in the distance. The tree's branches and leaves are silhouetted against the bright sky.

Mechanical Engineering Portfolio

Kevin Griffin
UCSB, 2013-2017

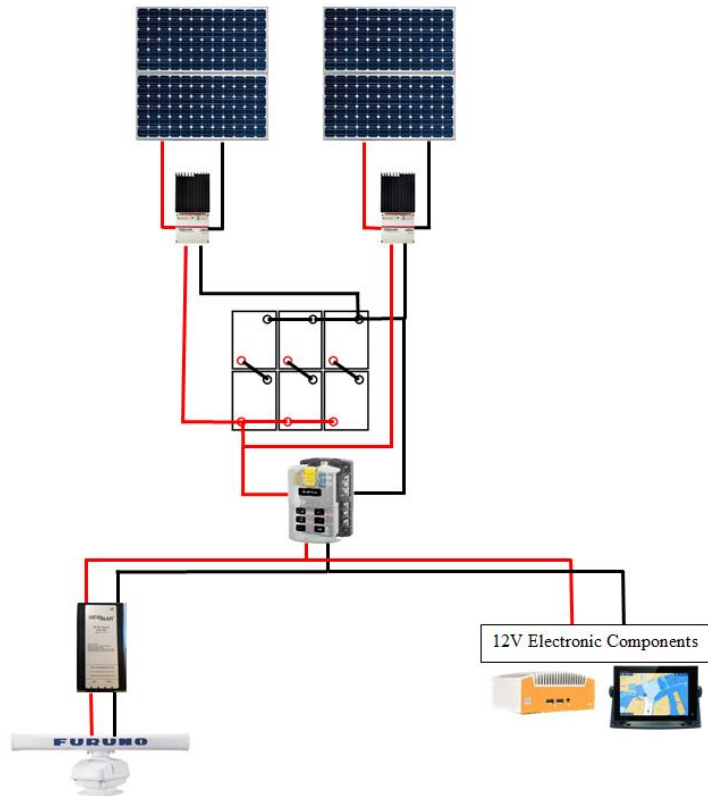
Capstone Project

- Solar powered marine radar system
- Built on a utility trailer chassis to allow for easy relocation
- Currently monitoring vessel activity around the Channel Islands

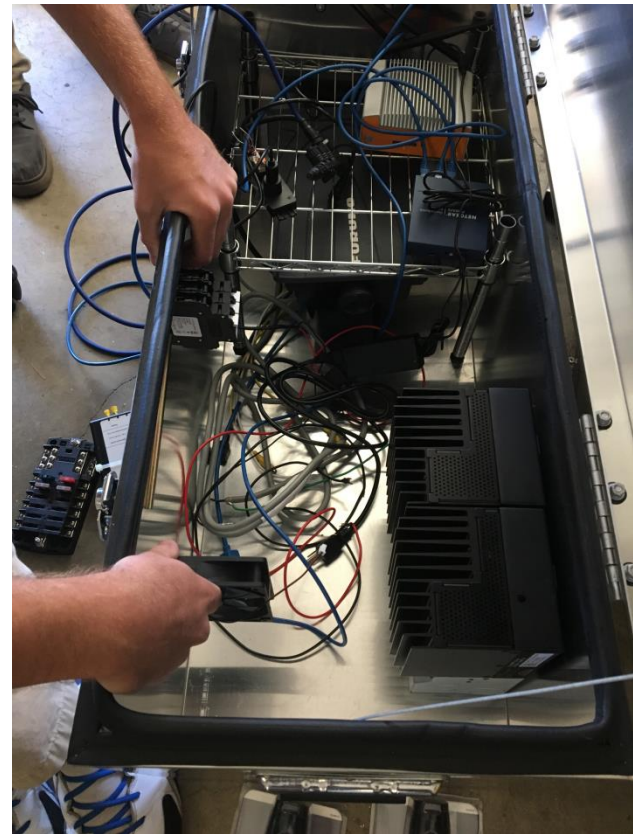


Capstone Project – Power Team Lead

Off-Grid Solar System Design

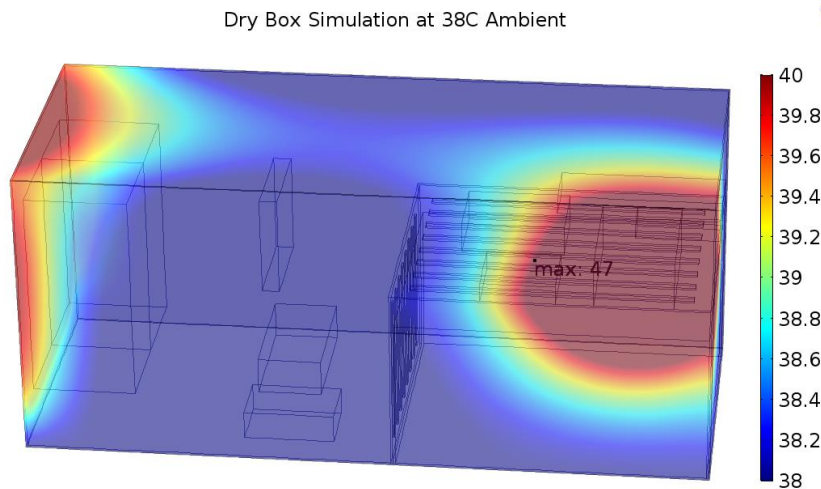


Sealed Electronics Box Design



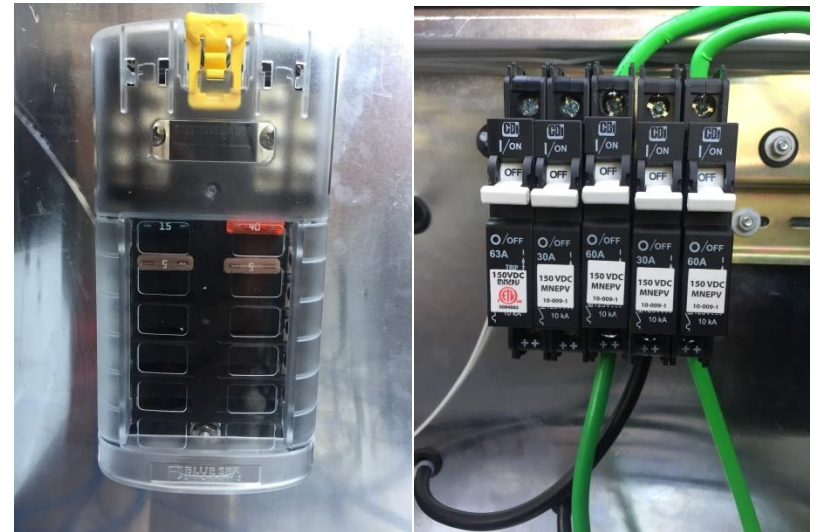
Capstone Project – Electronics Box Design

Thermal FEA in COMSOL



- Components were mounted flush to the enclosure to allow for direct conduction
- Internal circulation fans helped to eliminate local hot spots and aid in convection of heat to the enclosure

Electrical and Thermal Safeguards



Capstone Project – Electronics Box Design Cont.

- The enclosure needed to be sealed to limit corrosion from marine air
- Glands and heat shrunk conduits were used for data cable pass-throughs and trolling motor plugs were used for power connections

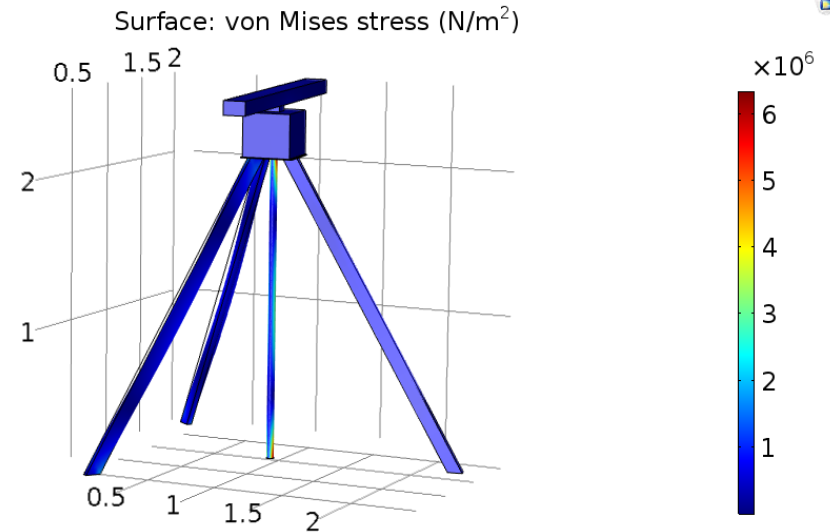


Capstone Project – Testing Rig

Test Installation on the NOAA Facility



COMSOL Model to Verify Structural Integrity



iCRco Internships

**Fiberglass CT Machine Enclosure
Design**



**Work Instructions and
Procedures for Assembly**

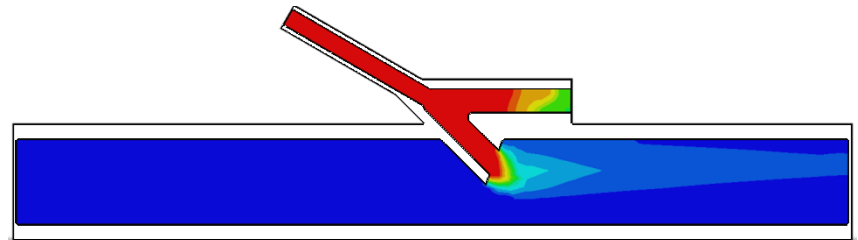


Junior Design Project

**Collapsible Countertop
Dishwasher**



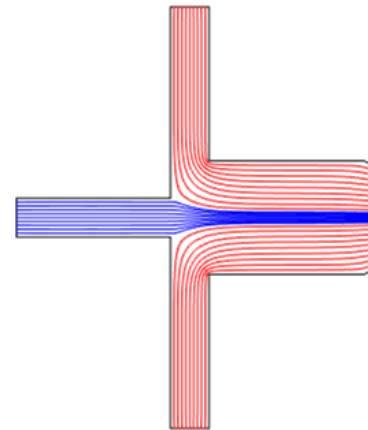
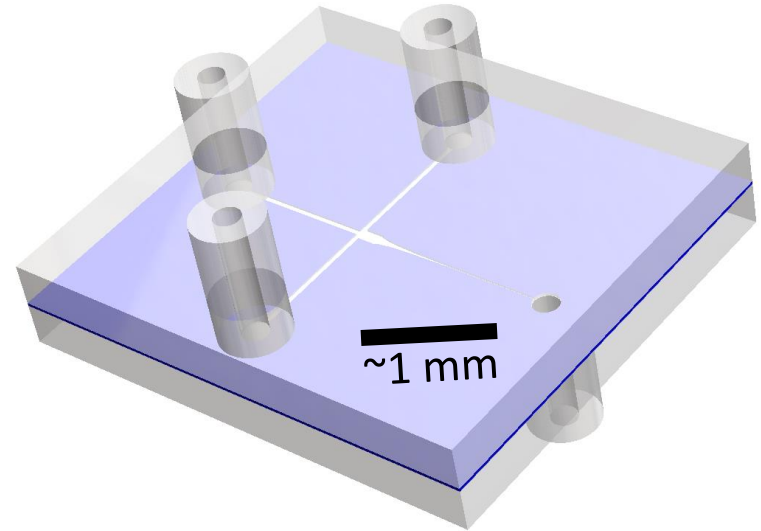
**SolidWorks Flow Simulation for
Venturi Tube Soap Feeder**



**“Most Technical” Award Winner at
the Junior Design Fair**

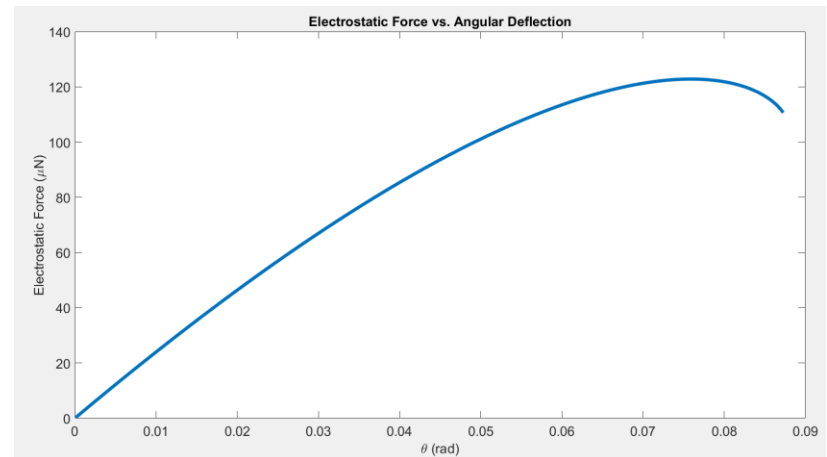
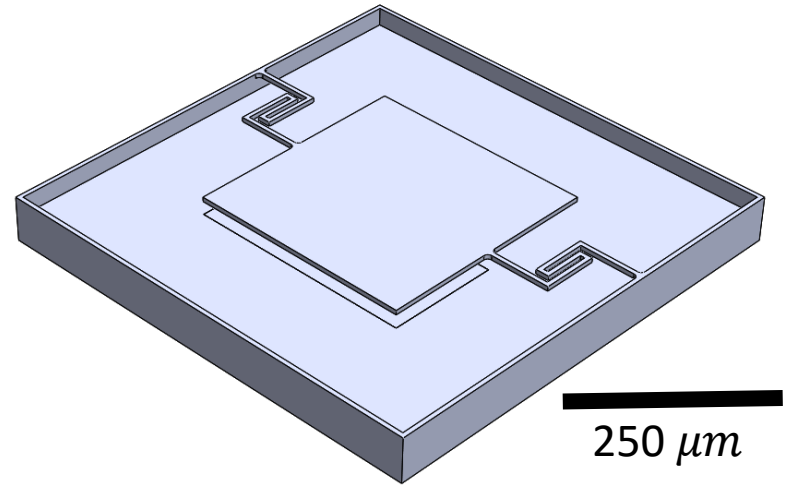
MEMS Design Course – Hydrodynamic Cell Stretcher

- Hypothetical microfluidic device which integrates with syringe pumps
- The T-shaped junction hydrodynamically focuses cells and the constriction applies a constant strain rate



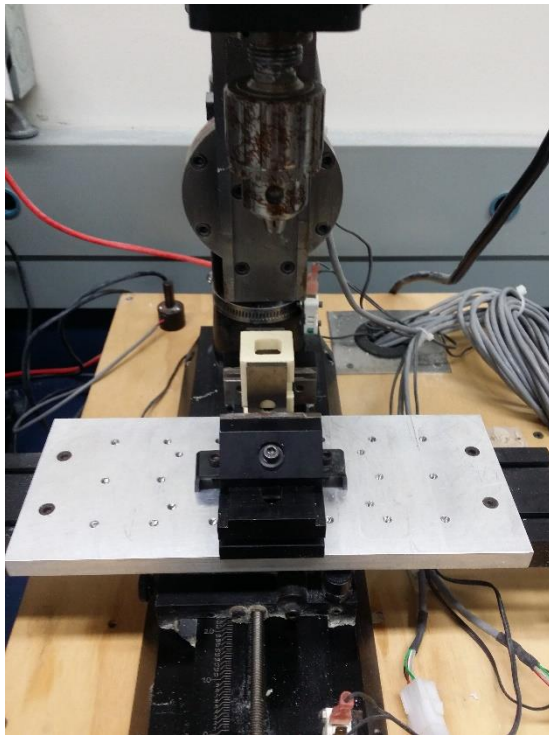
MEMS Design Course – Digital Micromirror Device

- Hypothetical DMD device
- Designed spring geometry to limit the electrostatic force needed for a 5° tilt

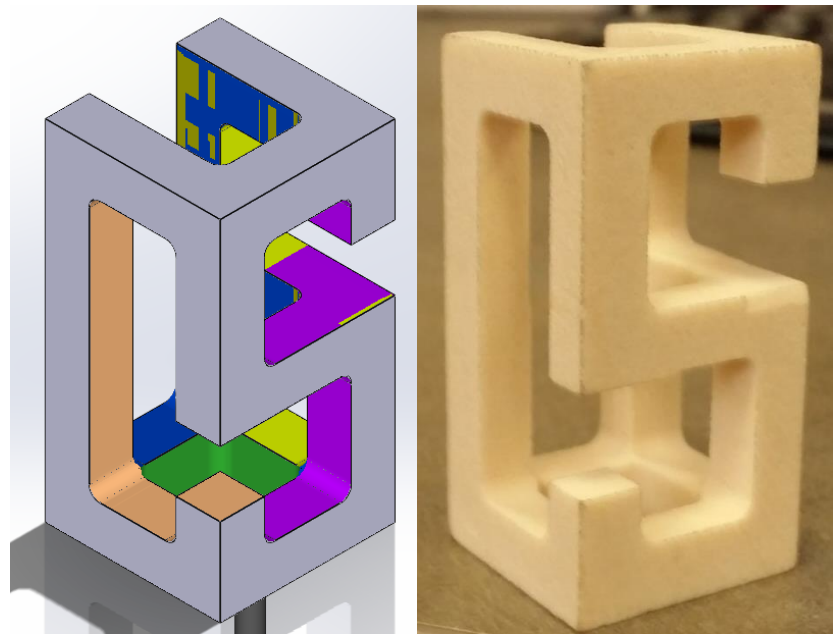


CAD/CAM Course – CNC Milling

CNC Milling

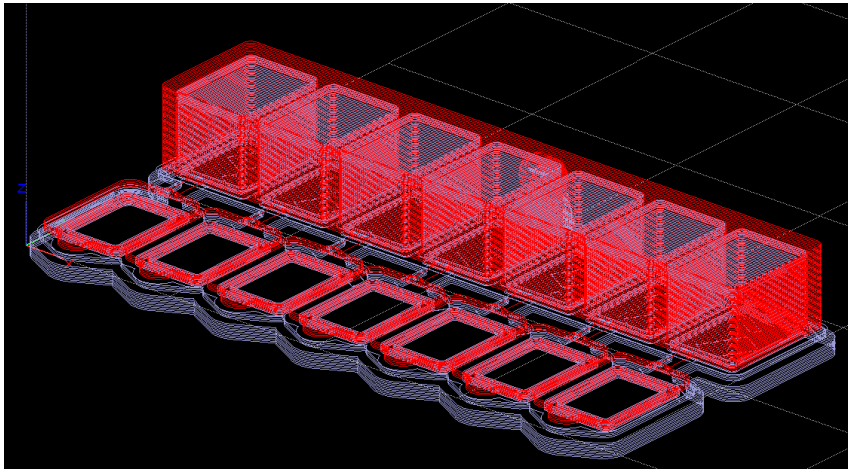


HSM Simulation / Actual Result

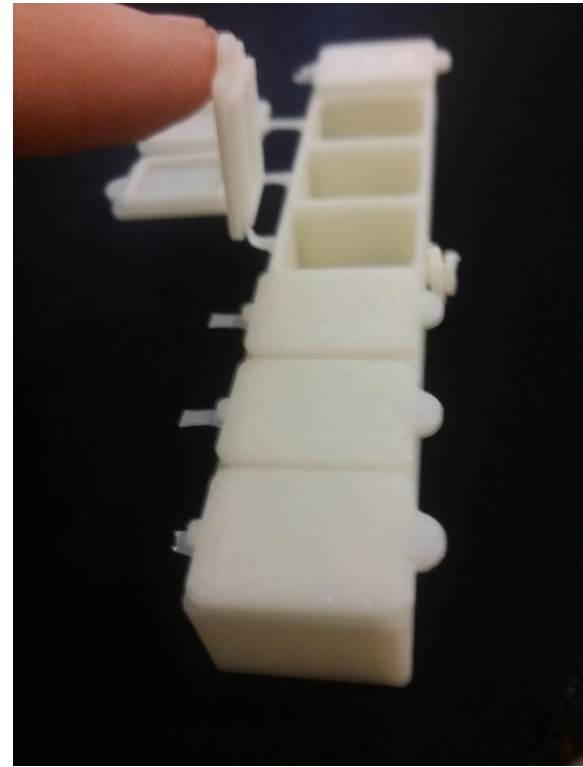


CAD/CAM Course – 3D Printing

Catalyst 4.5 Pack Image



3D Printed Pill Box with Living Hinges



Machining Course

- Followed engineering drawings to build a compressed air motor from raw materials
- Utilized mills, lathes, bandsaws, and hand tools

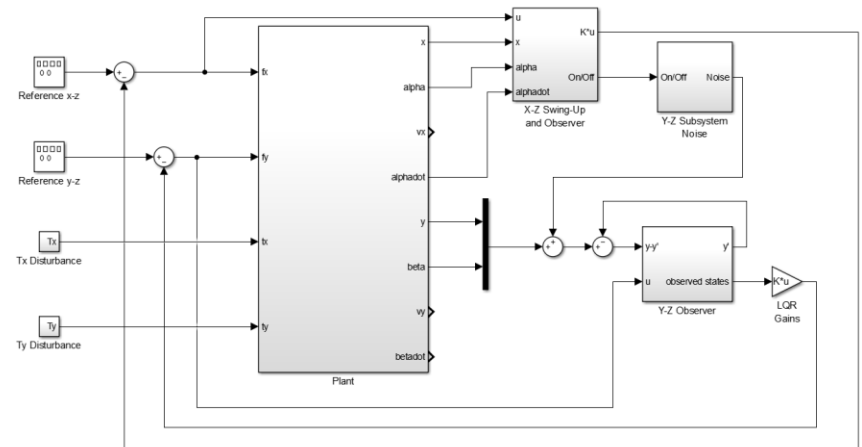


Controls Laboratory Course

Spherical Inverted Pendulum attached to a 2 DOF Actuator

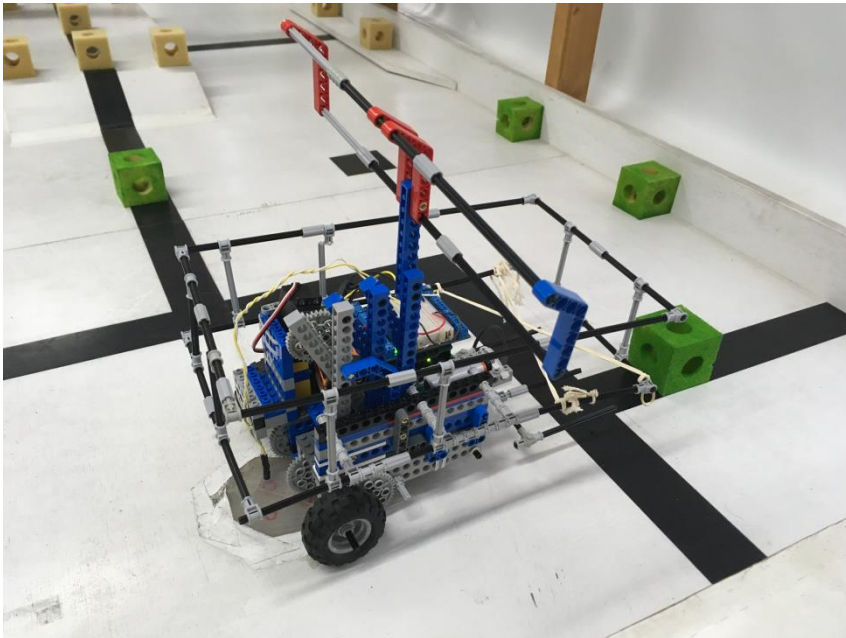


Simulink/SimMechanics Observer Based Controller with Swing Up

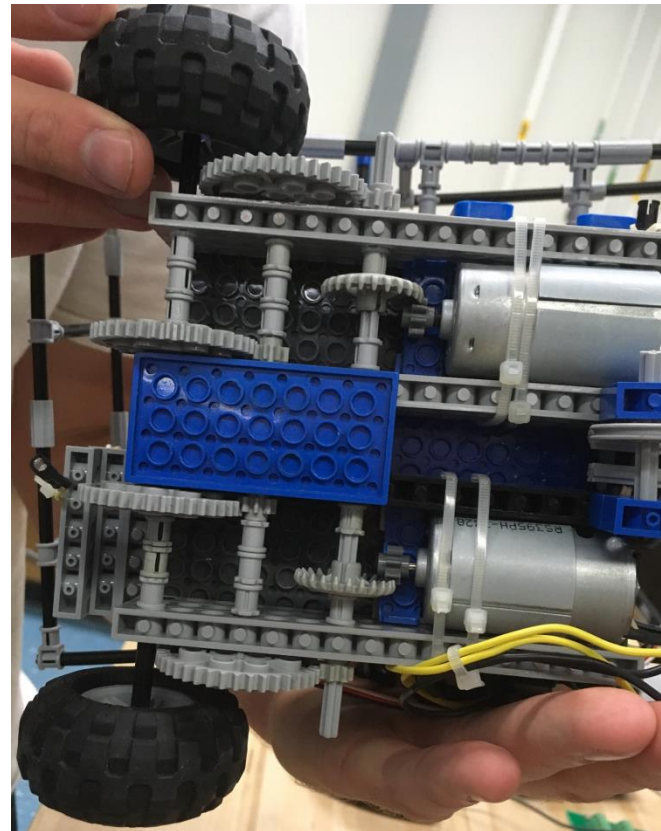


Robotics Design Course

Arduino and LEGO Based Robot

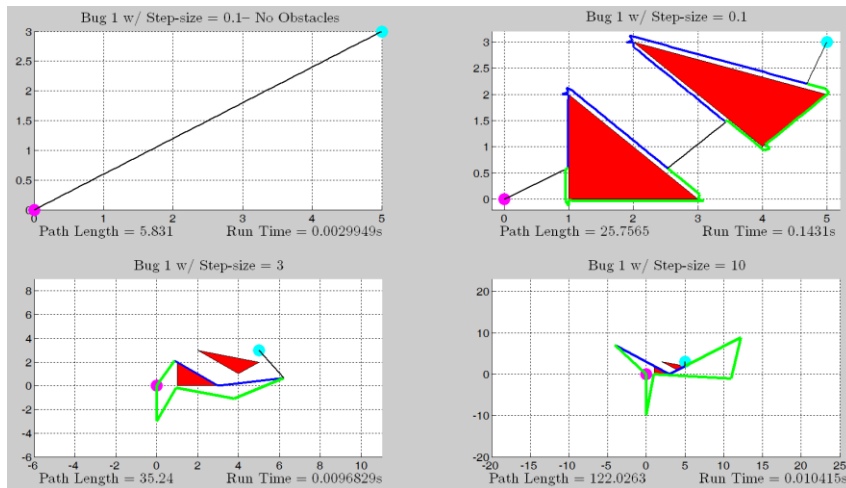


Drivetrain Detail View

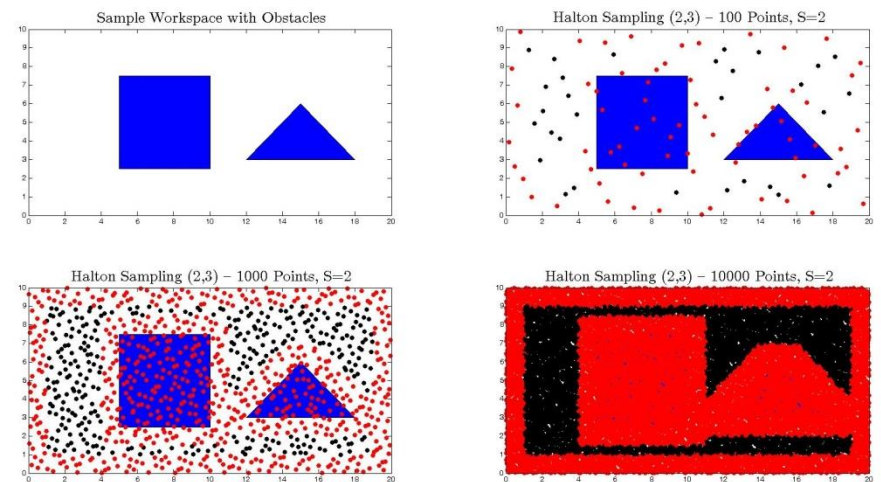


Robotics Planning Course

Robot Motion Planning in MATLAB

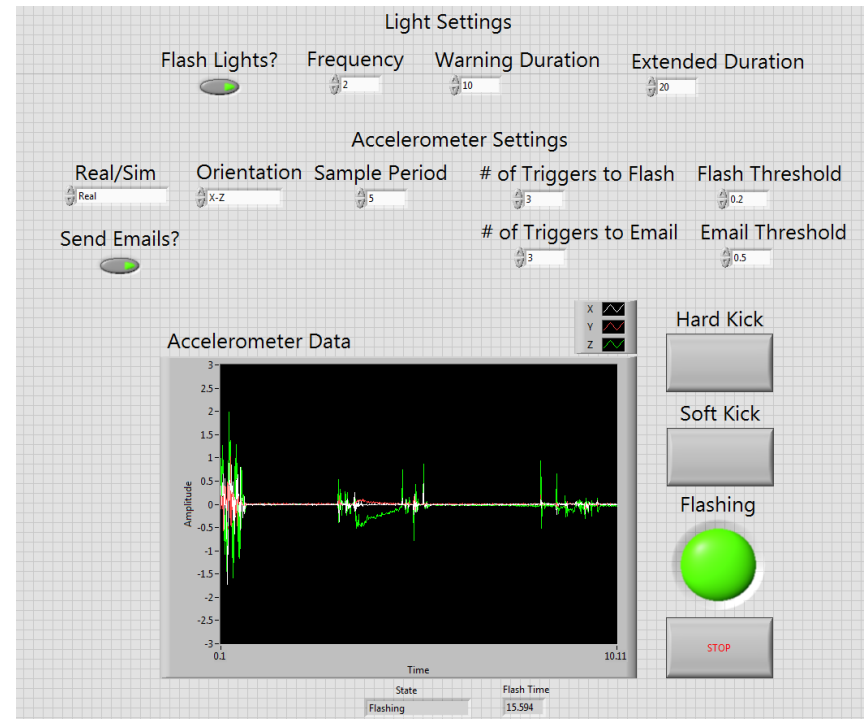


Sampling to Generate Free Configuration Space



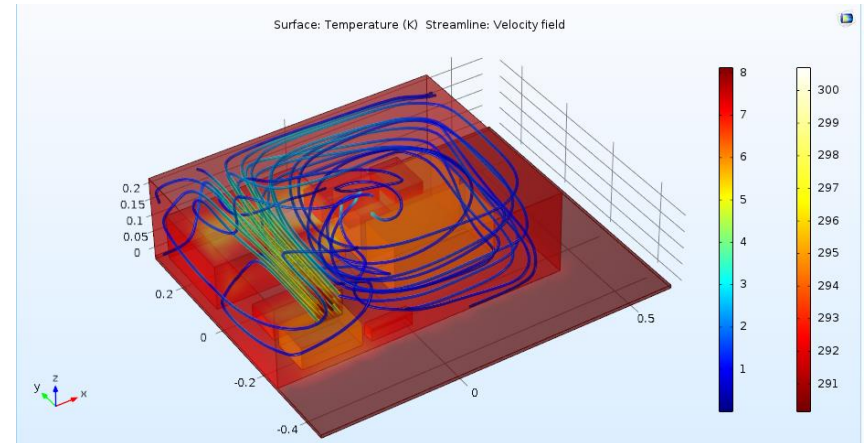
LabVIEW Course

- Developed VIs to control motor module performance via tachometer and optical sensor feedback
- Developed an accelerometer based anti-theft system with email notifications (shown to the right)



COMSOL Optimization Course

- Optimized fan placement within an electronics enclosure
- Fully coupled turbulent flow and heat transfer



Undergraduate Research – MATLAB GUI Development

- Input: Seismic information in the SEG-Y format
- Output: 2D or 3D ParaView file (.vtk) with velocities and arrival times

