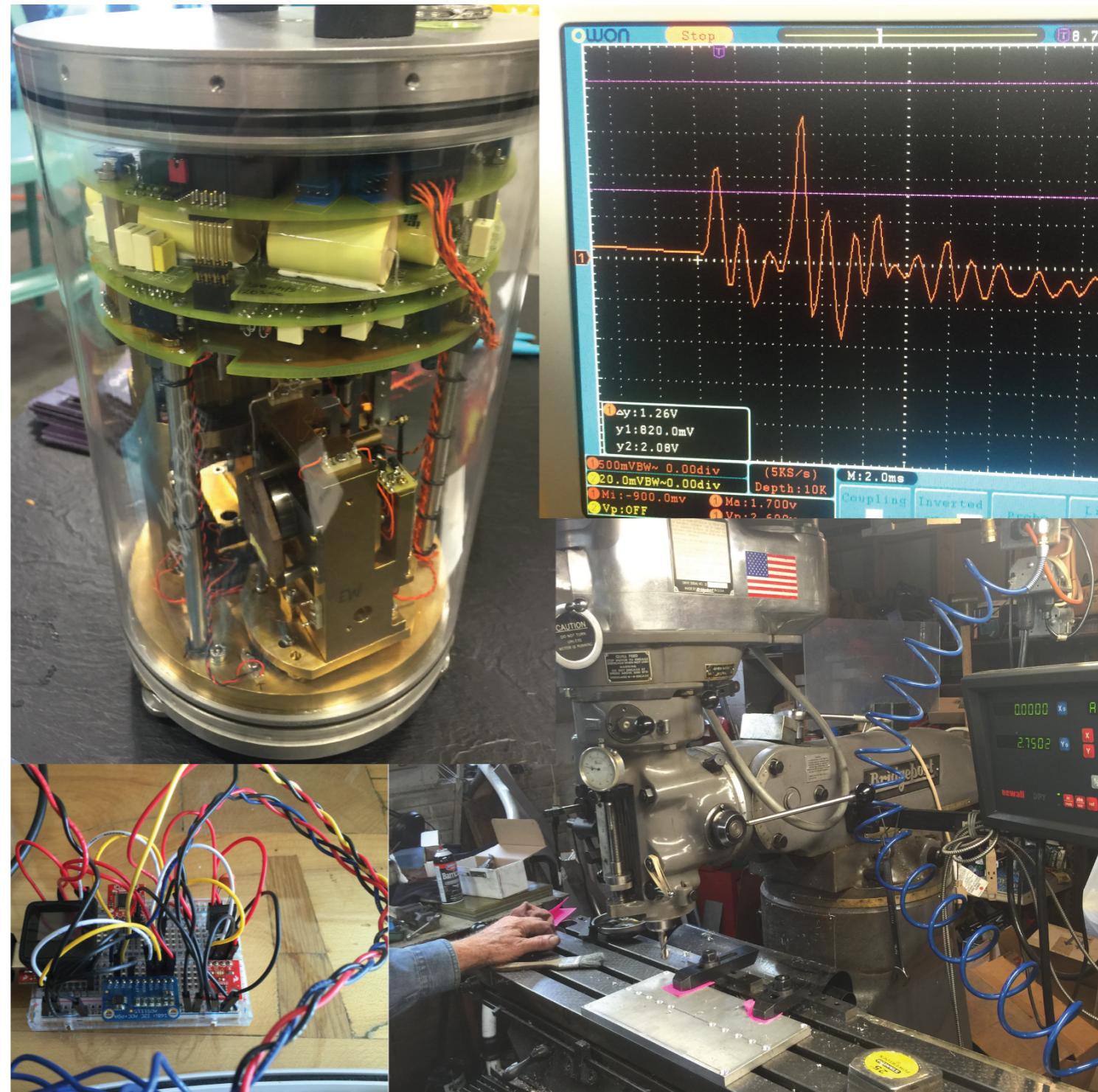


Course Introduction and Arduino Setup

J.R. Leeman and C. Marone

Techniques of Geoscientific
Experimentation

August 30, 2016



Please read the syllabus and lecture outlines! This is a hands on class that requires participation

Course Goals

1. To learn how to **design and build** basic mechanical and electrical devices for laboratory measurement work.
2. Gain **hands-on experience** using real equipment, sensors, and machines.

Exercises	40%
Final Project	50%
Class Participation	10%

Bring your Inventor's Kit and Laptop to every class

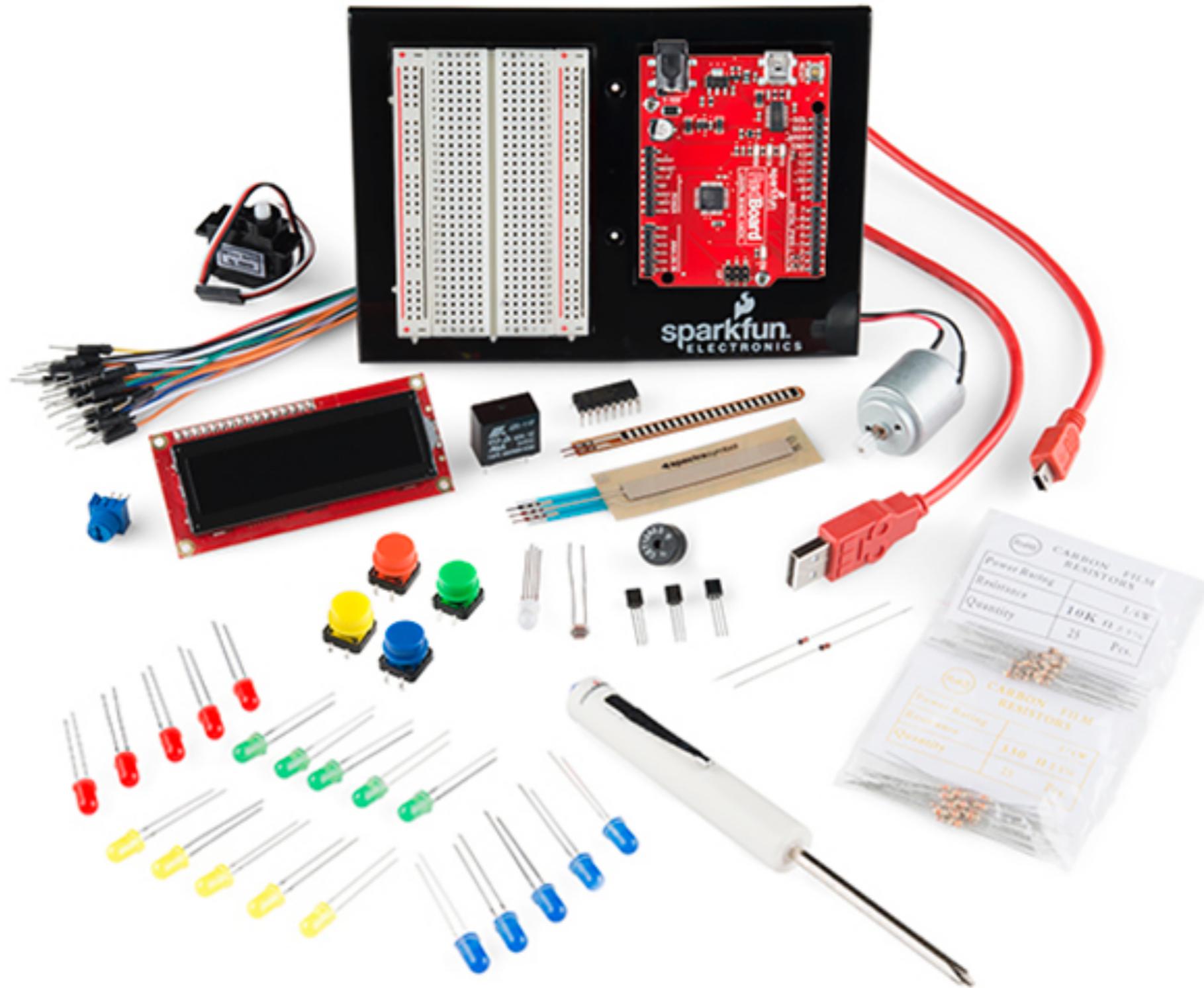


Image: sparkfun.com

Bookmark the course website now

http://tge.geoscience.tech



The screenshot shows the homepage of the Techniques of Geoscientific Experimentation (TGE) website. The header includes the TGE logo, a 'latest' link, and a search bar. A sidebar on the left lists categories like 'Shop Tools and Practices', 'Mechanical', 'Electronics', 'Transducers', 'Control Systems', and 'Lab Exercises'. A callout at the bottom left encourages bookmarking the site. The main content area features a heading 'Techniques of Geoscientific Experimentation' and a paragraph describing the resource as a guide for developing experimental equipment. It also credits John Leeman and Chris Marone and links to geosci.xyz. On the right, there's a collage of images related to geoscientific experimentation, including a close-up of internal machinery, a waveform on a screen, and a person working with equipment.

TGE
latest

Search docs

Shop Tools and Practices

Mechanical

Electronics

Transducers

Control Systems

Lab Exercises

Open Source (including Read the Docs) is  underfunded. This report from the Ford Foundation is a must-read.

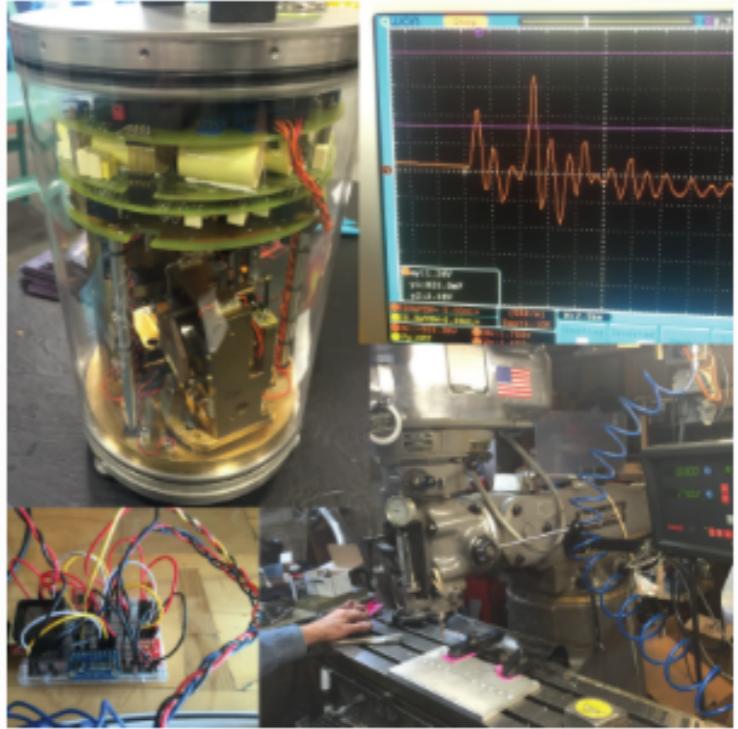
Docs » Techniques of Geoscientific Experimentation



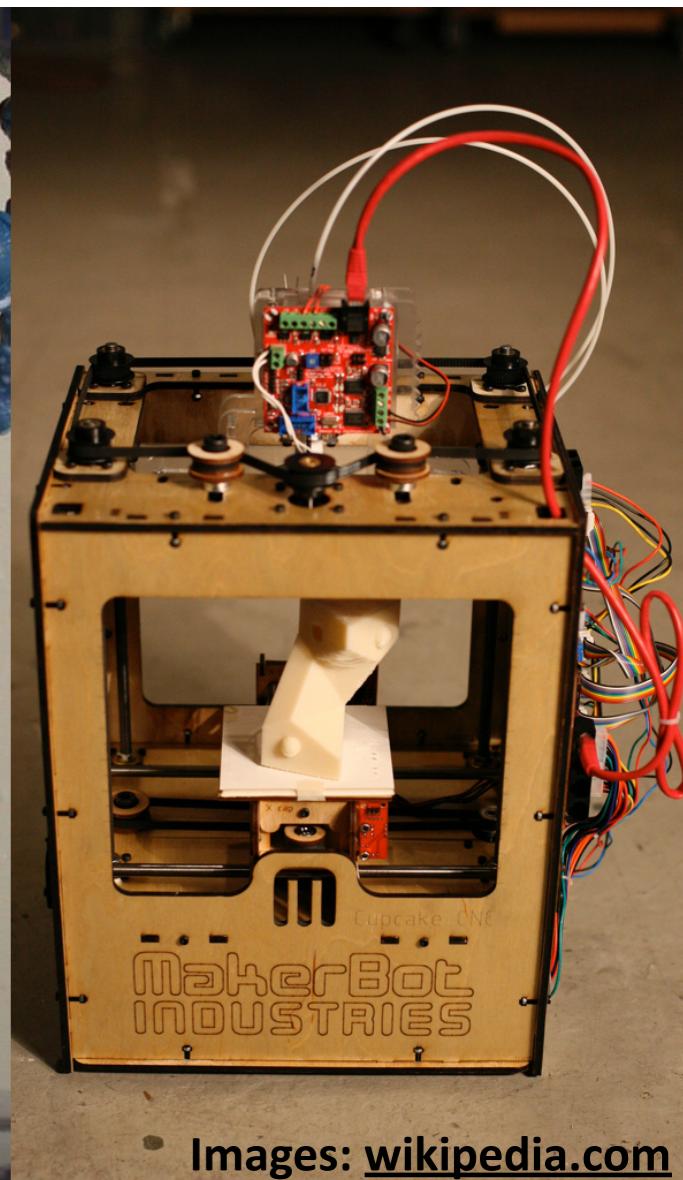
Techniques of Geoscientific Experimentation

Techniques of Geoscientific Experimentation (TGE) is a resource designed to help scientists, hobbyists, and experimentalists learn how to develop their own experimental equipment. Topics include mechanical design, data acquisition, electronics, microcontrollers, CAD, pressure vessel design, and more.

This course material has been primarily developed by John Leeman and Chris Marone. The format and online format of the course are patterned after the excellent course structure developed by researchers and students at the University of British Columbia. Their courses are available on [geosci.xyz](#). We encourage others to use the material with proper citation. Contributions are welcome and encouraged - the material improves through repeated use! Join the development on [github](#).



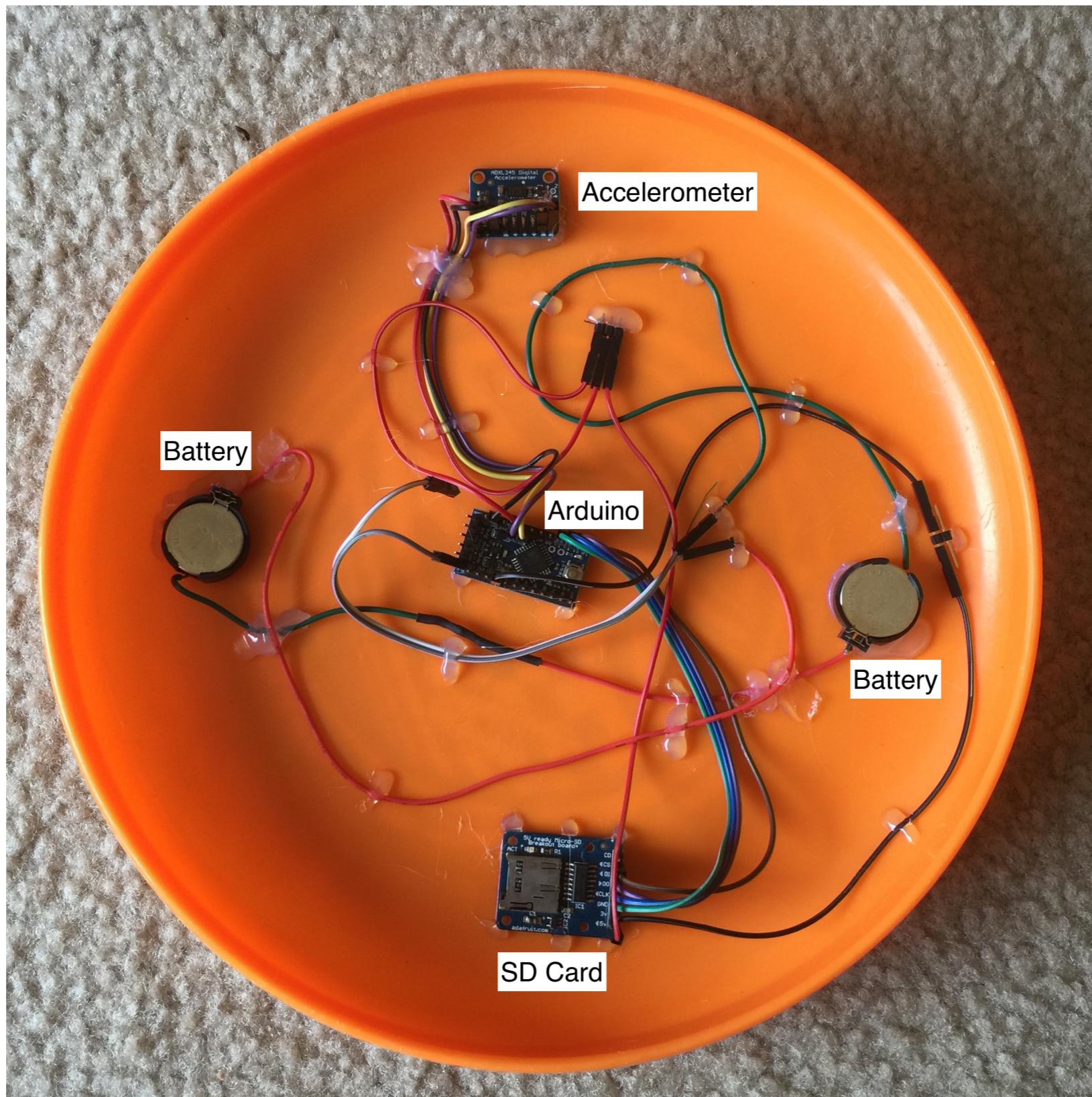
This backbone of this course is a semester long project that helps you with your research



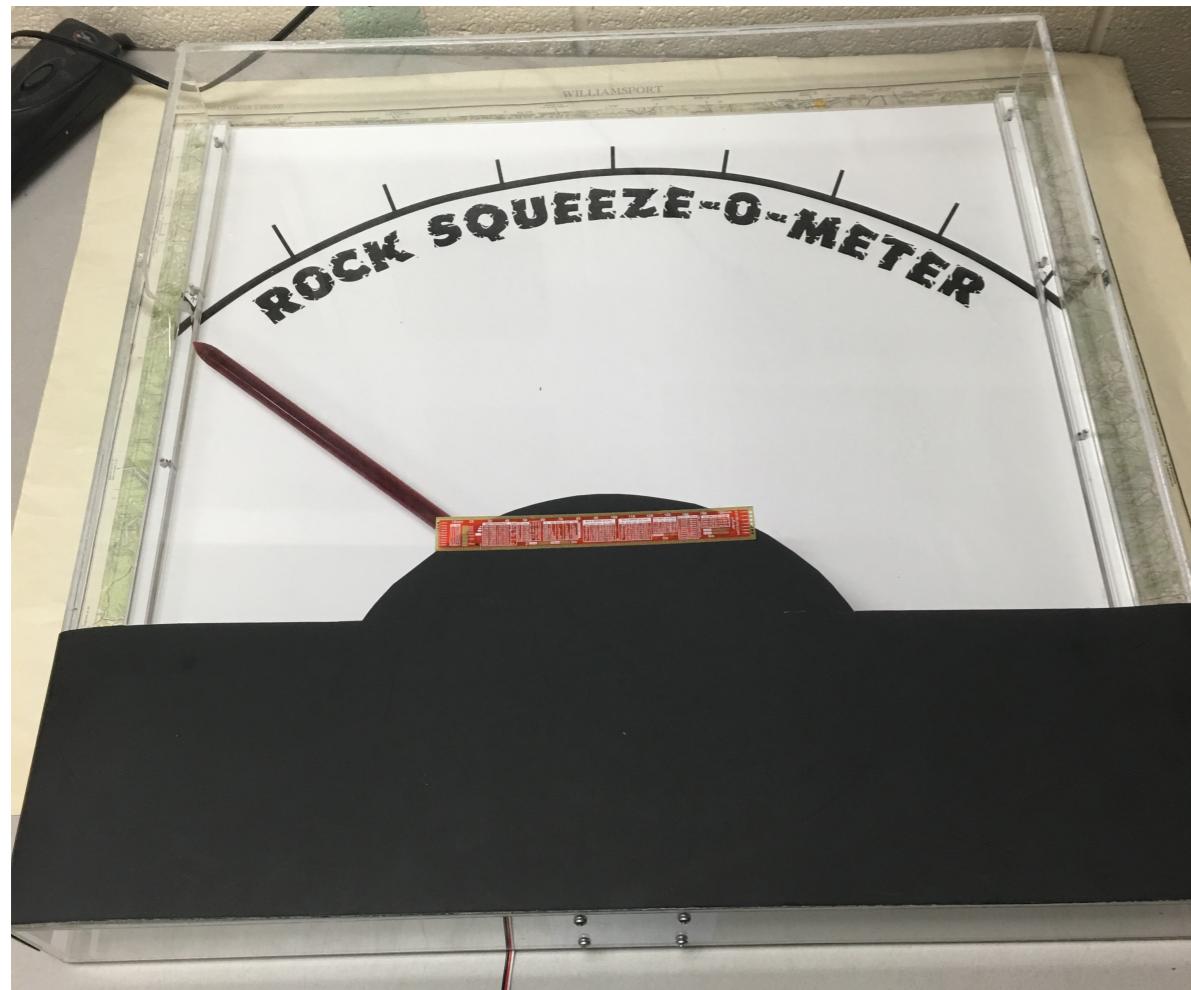
Images: [wikipedia.com](https://en.wikipedia.org)

- Uses multiple disciplines we discuss (i.e. mechanical, electrical, software, etc.)
- Solves a problem with no commercial solution or no economical commercial solution.
- Will not cost thousands of dollars to build
- Does not put you or others in the path of potential harm or danger.

A few example projects



A few example projects



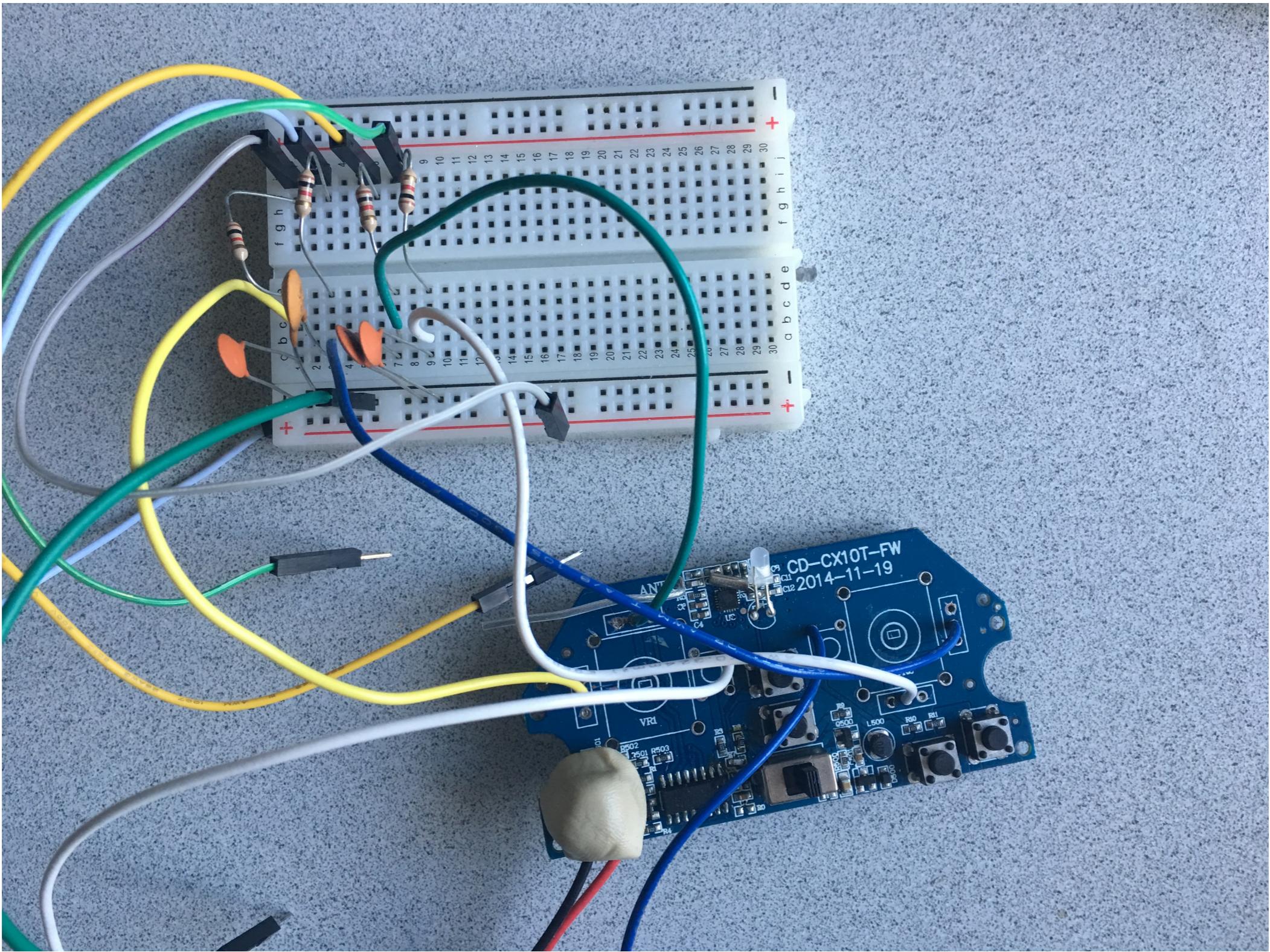
A few example projects



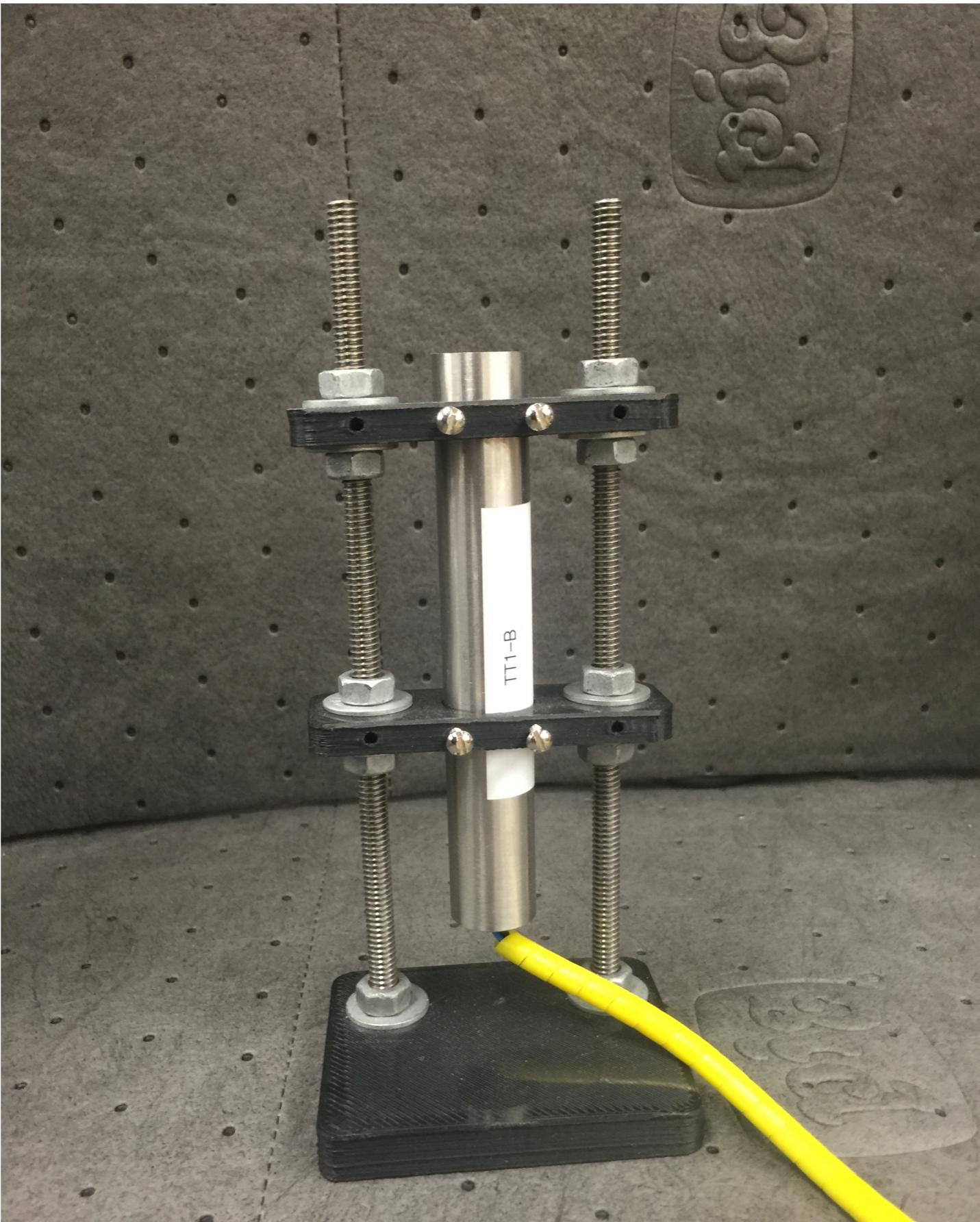
A few example projects



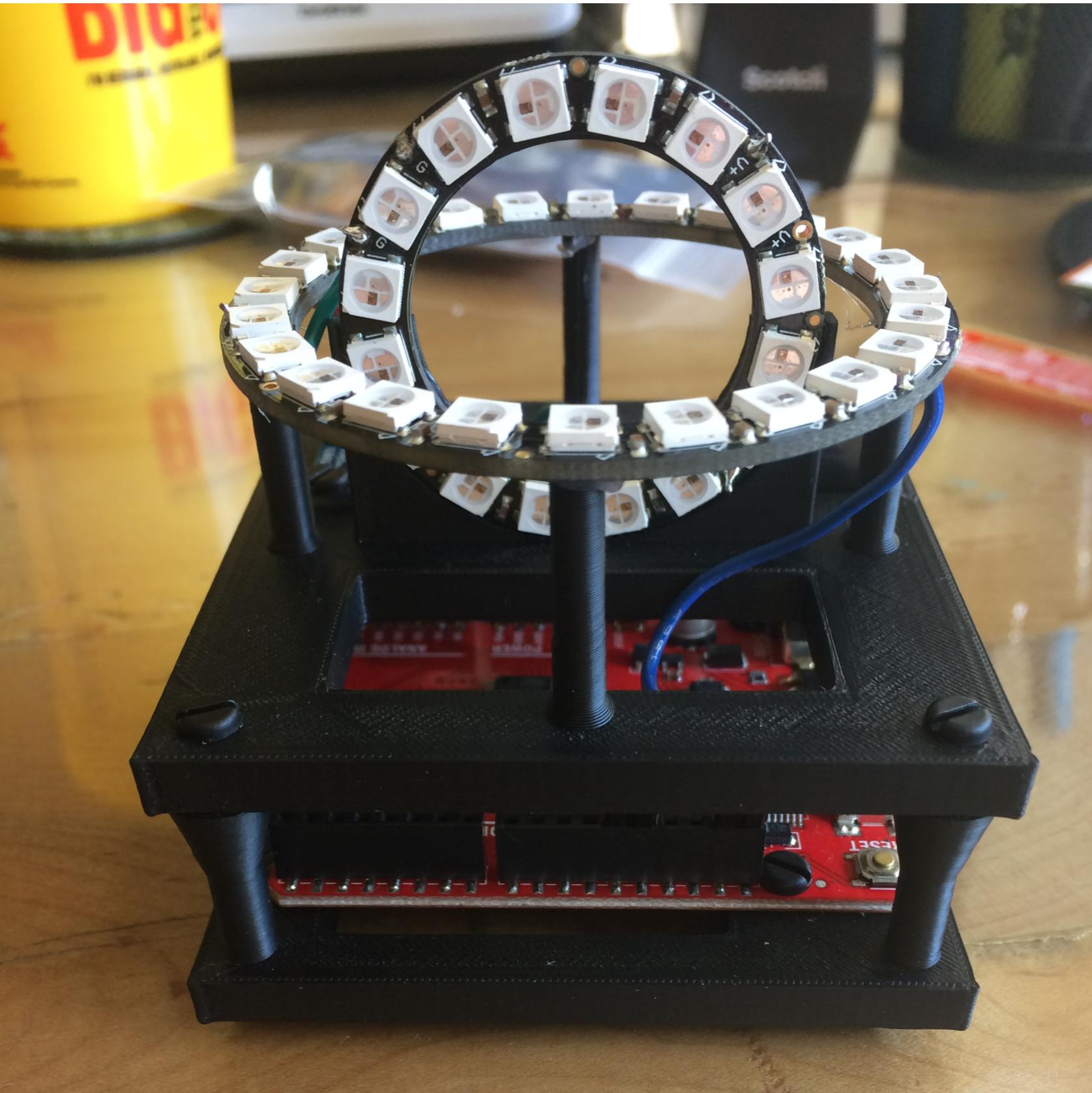
A few example projects



A few example projects



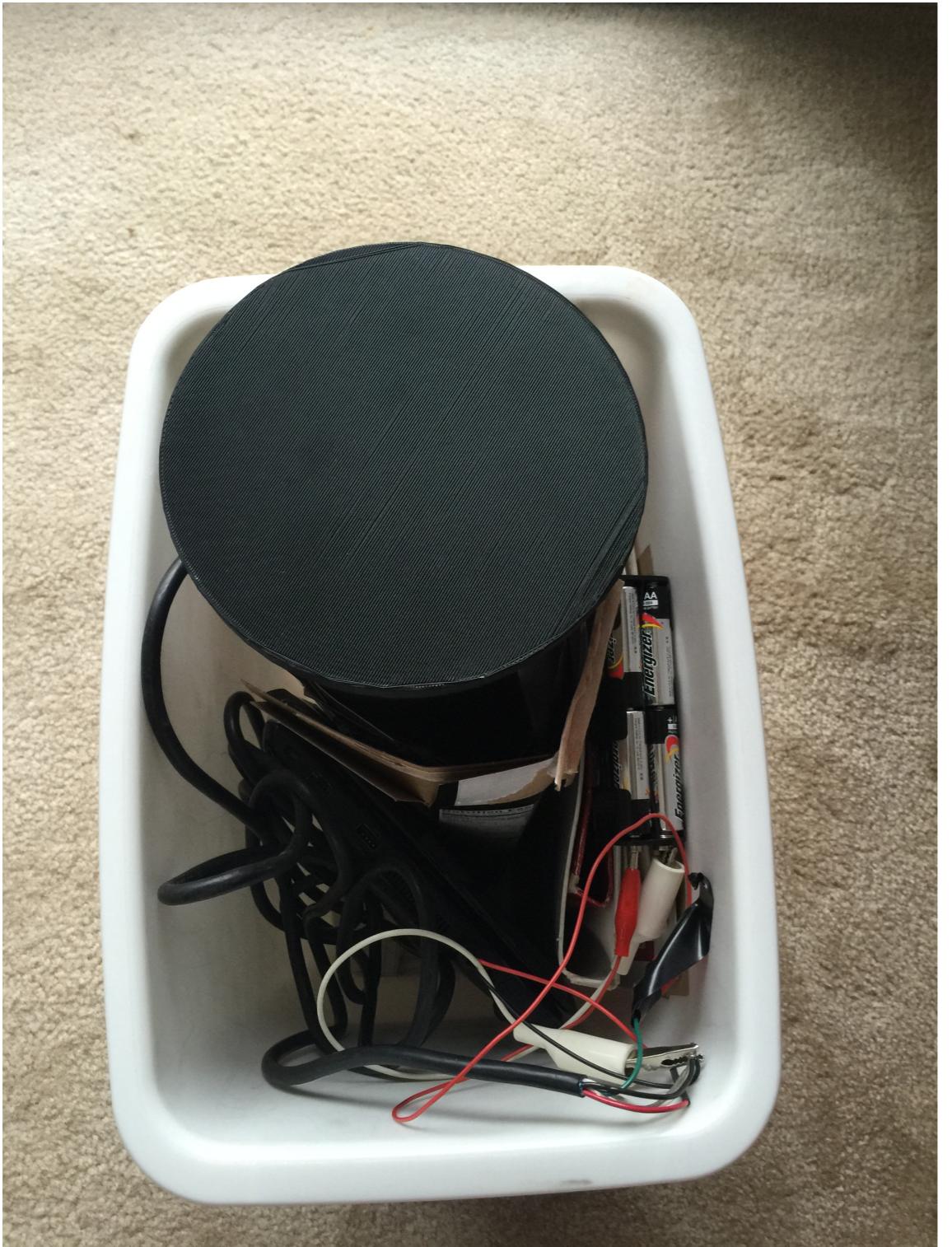
A few example projects



A few example projects



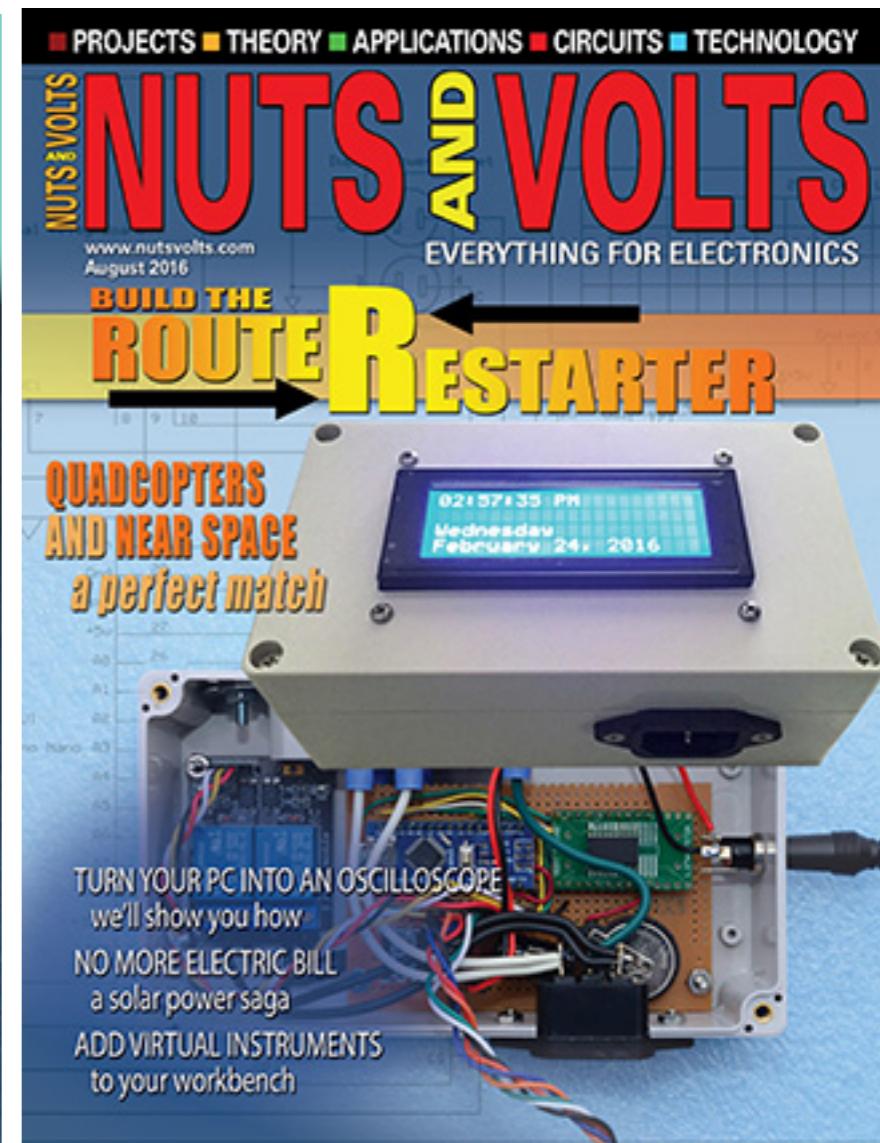
A few example projects



A few example projects



Sources of inspiration are everywhere



Let's dig into the inventor's kits and see what you have

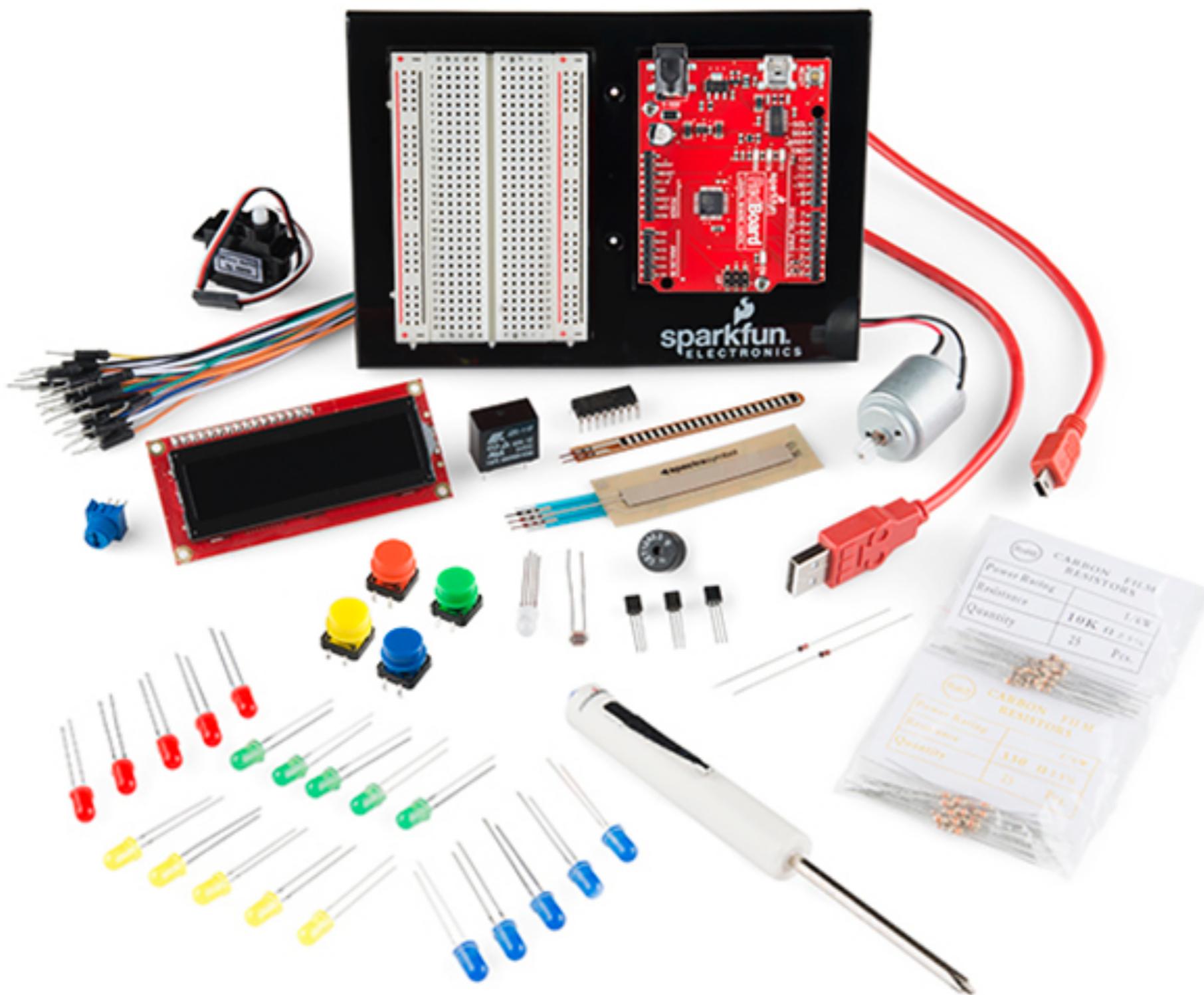


Image: sparkfun.com

Activity: Blinky 1.0

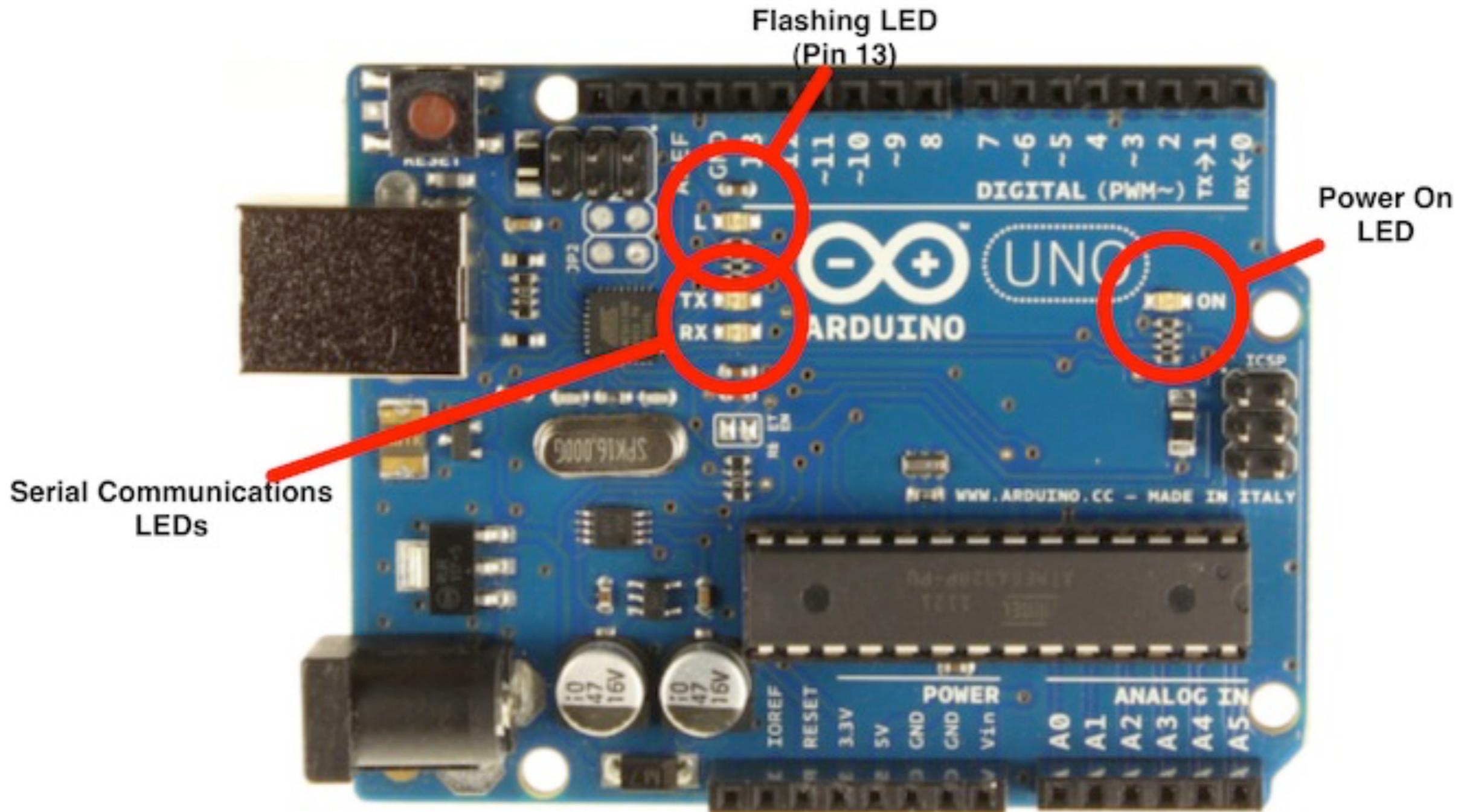


Image: geekdad.com

Assignment: Project Brainstorm

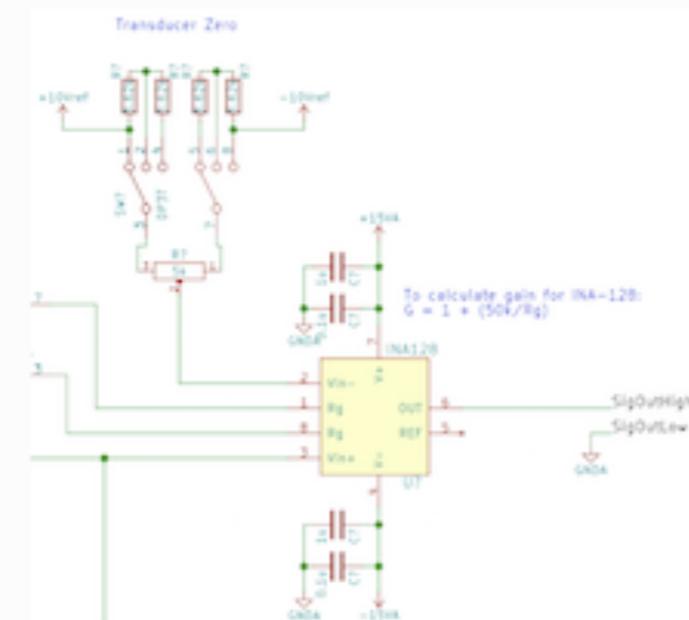
Docs » Lab Exercises » Project Brainstorm

 Edit on GitHub

Project Brainstorm

The course project should help you solve a research problem you are facing while helping you actively learn many of the skills introduced in this course. The best way to learn is through trial and error - there is sure to be a lot of both during your project. We would like to help you define a project that is within the scope of the course and the semester time limit on the work. A good project will have several characteristics:

- Uses multiple disciplines we discuss (i.e. mechanical, electrical, software, etc.)
- Solves a problem with no commercial solution or no economical commercial solution.
- Will not cost thousands of dollars to build Does not put you or others in the path of potential harm or danger.



Brainstorm 5 potential project ideas.

DUE: 9/6/16 with a meeting done or setup