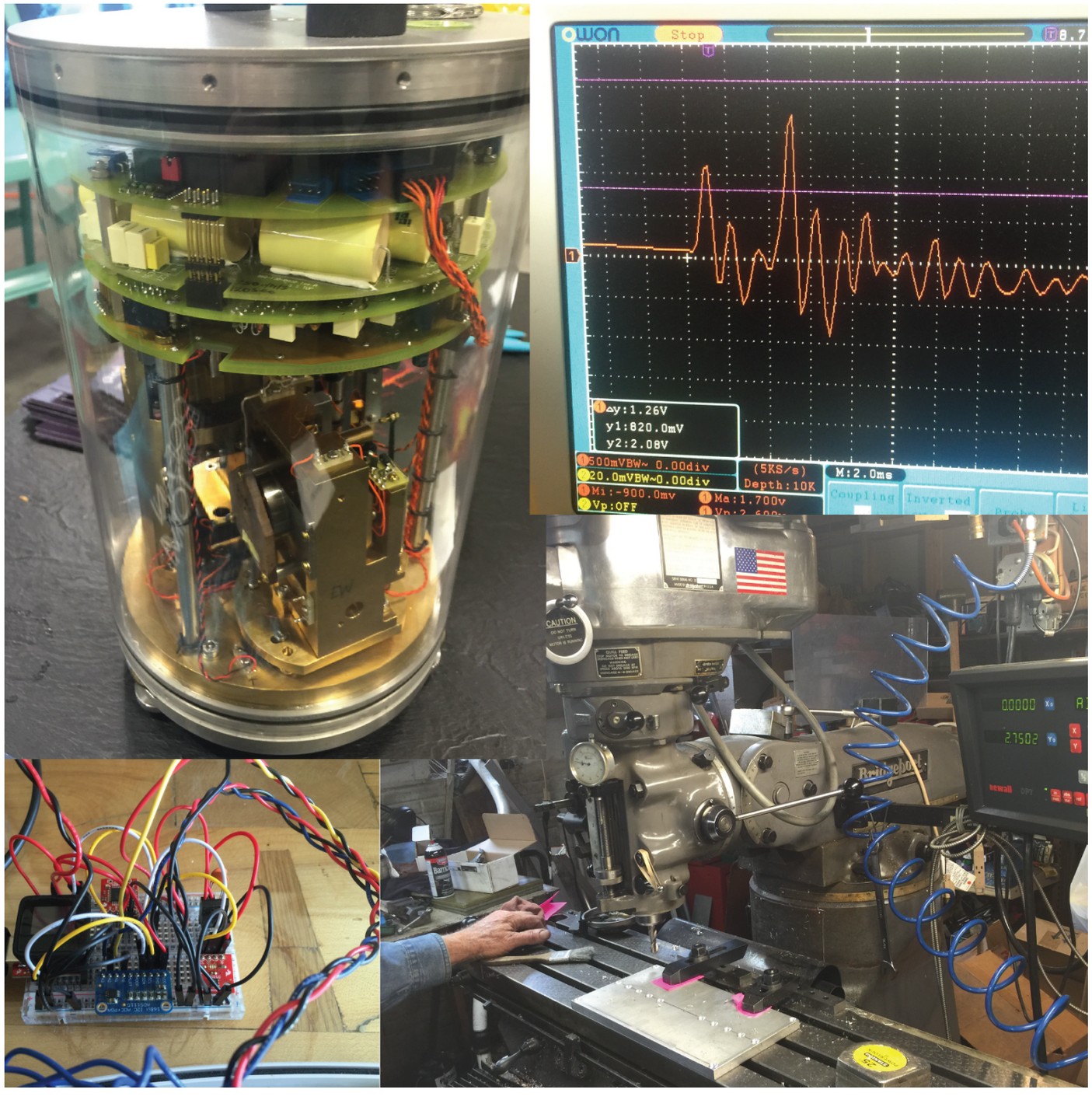
Course Introduction and Arduino Setup

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

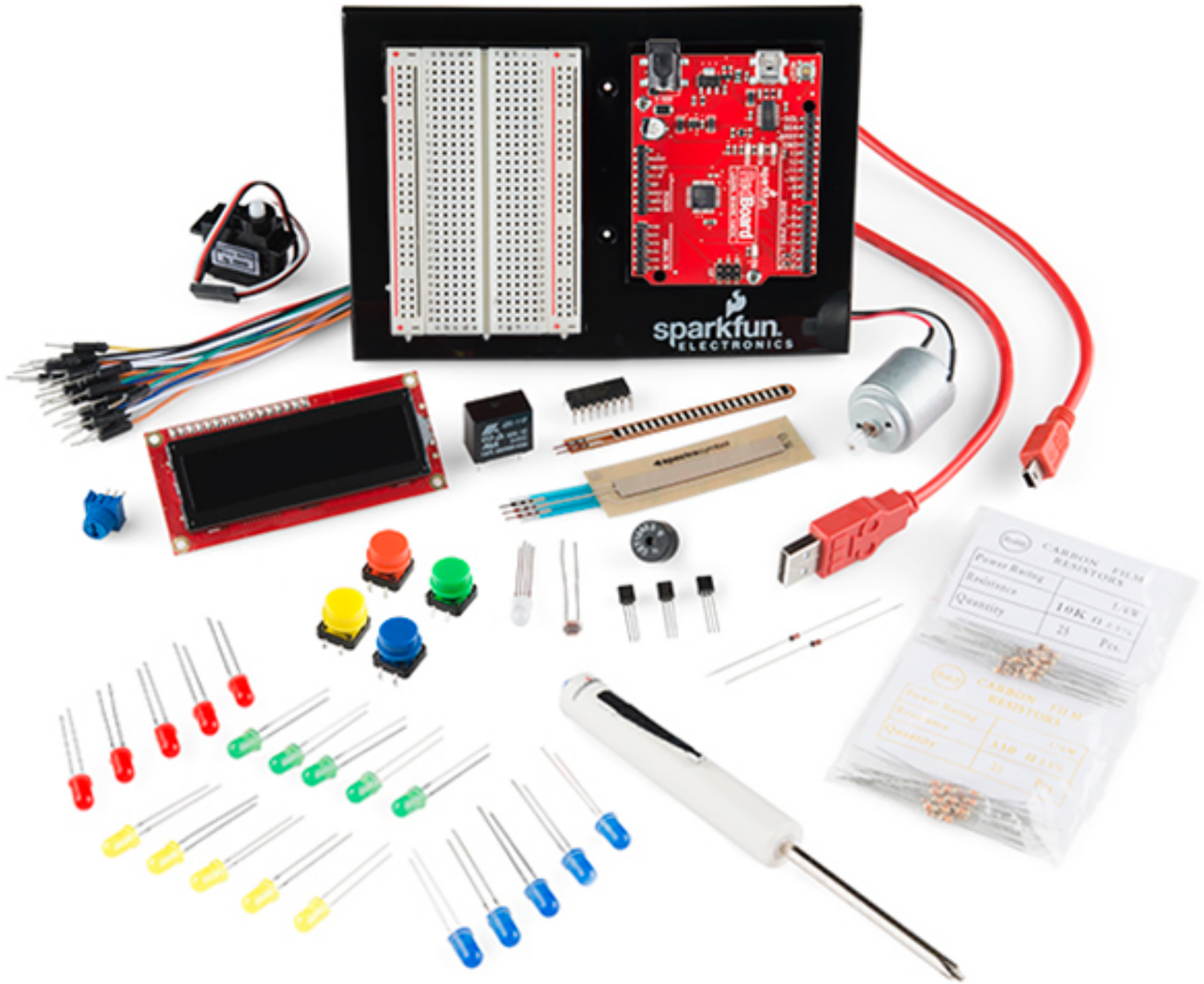


Image: sparkfun.com

Bookmark the course website now

http://tge.geoscience.tech

TGE

latest

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Shop Tools and Practices

Mechanical

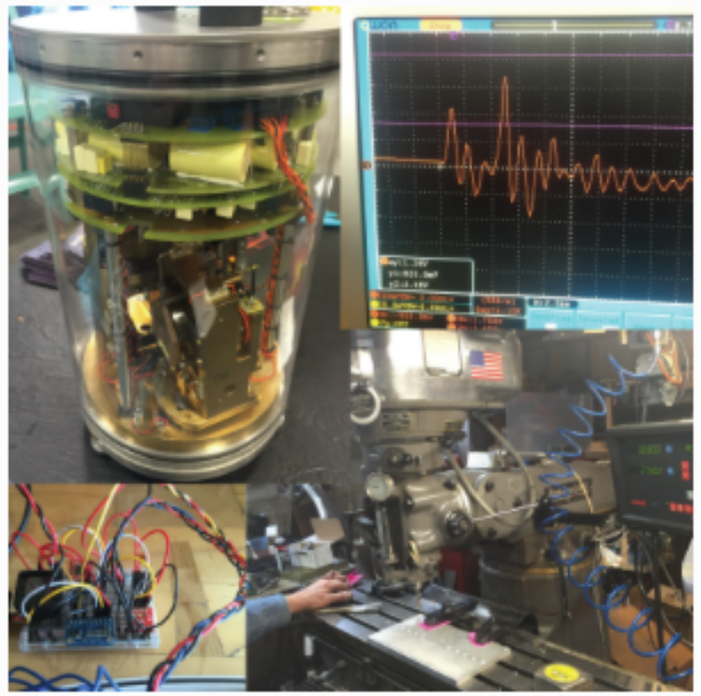
Electronics

Transducers

Control Systems

Lab Exercises

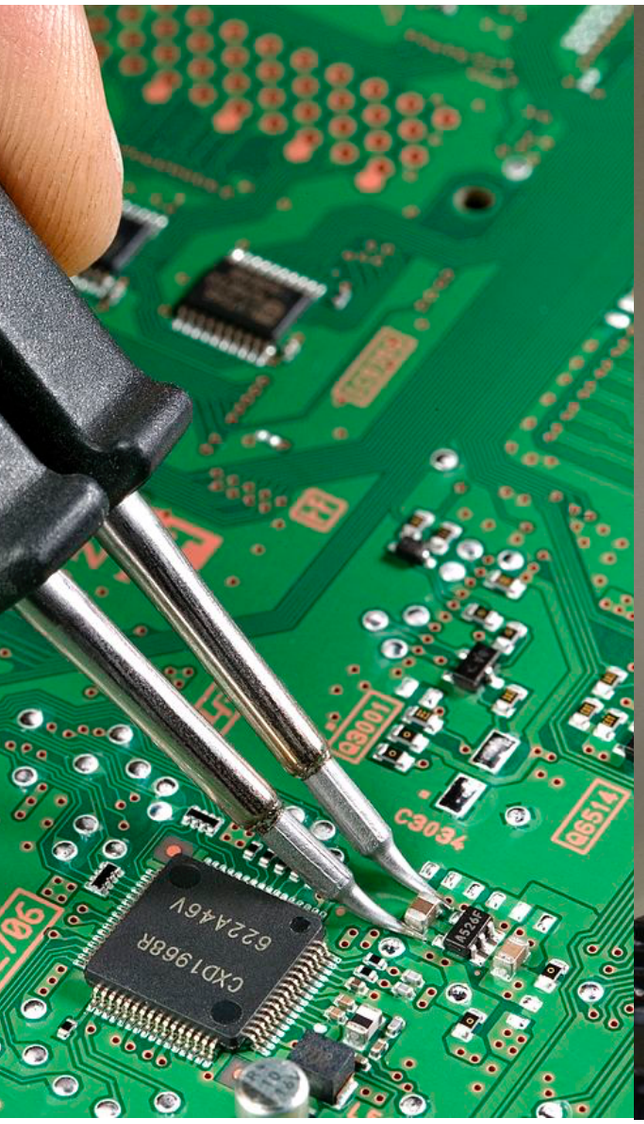
Techniques of Geoscientific Experimentation



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 though repeated use! Join the development on github.

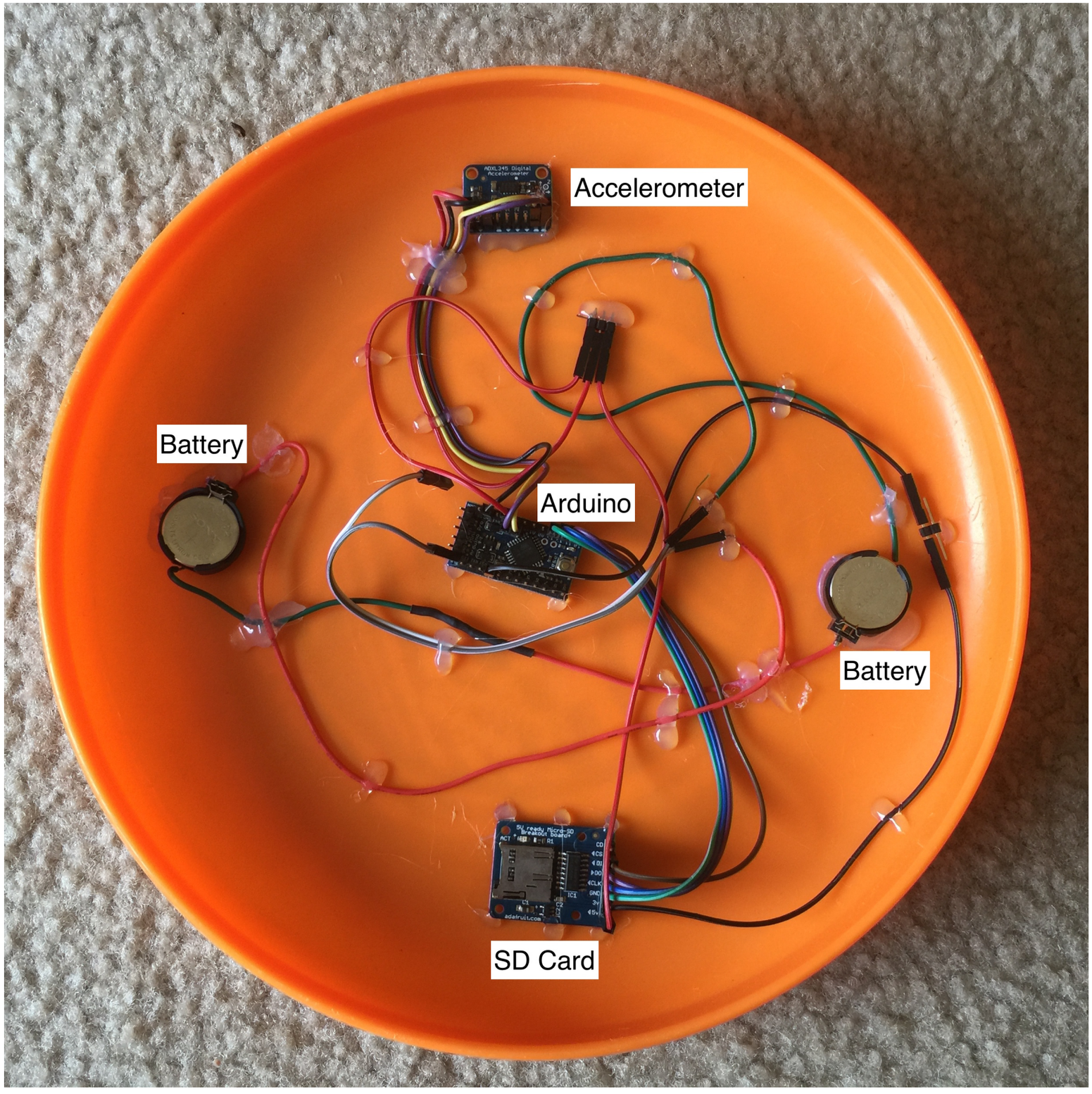
This backbone of this course is a semester long project that helps you with your research



Images: wikipedia.com

- 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



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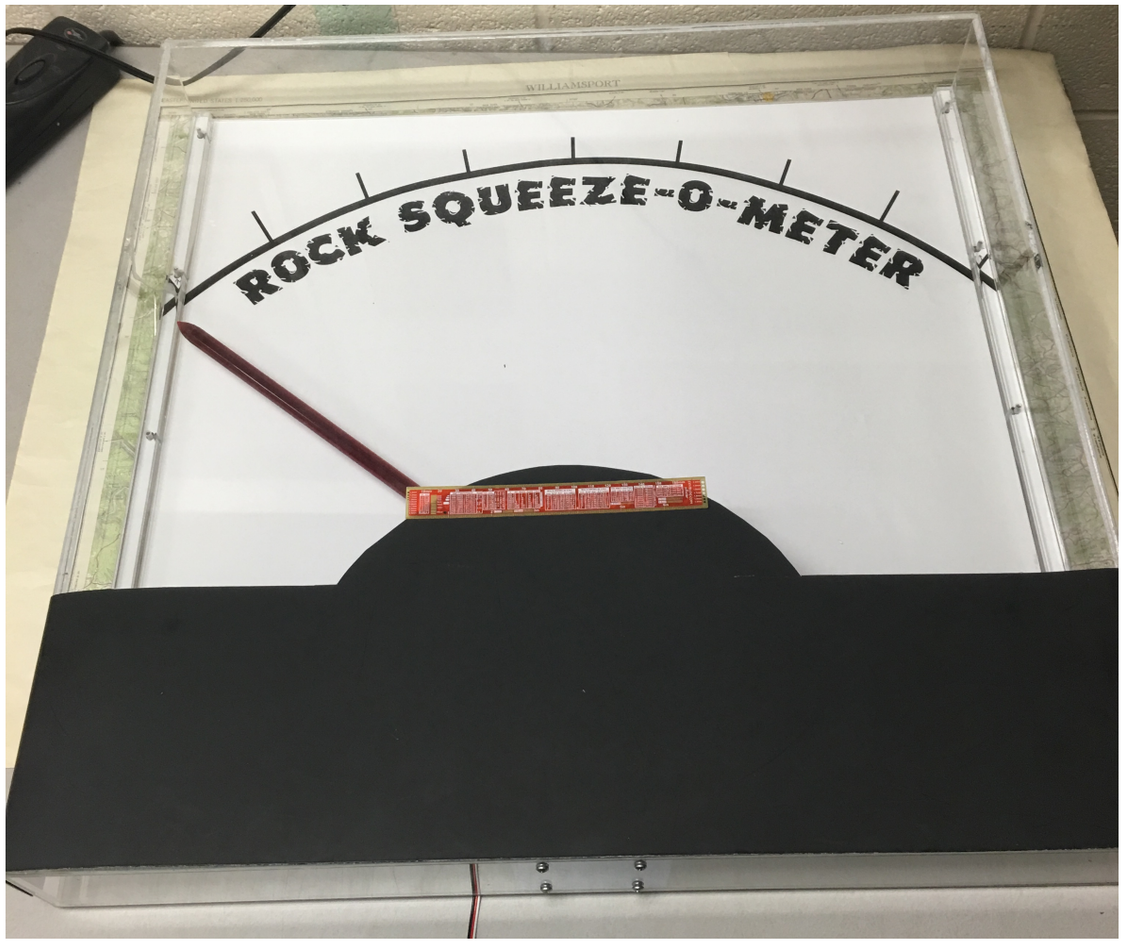

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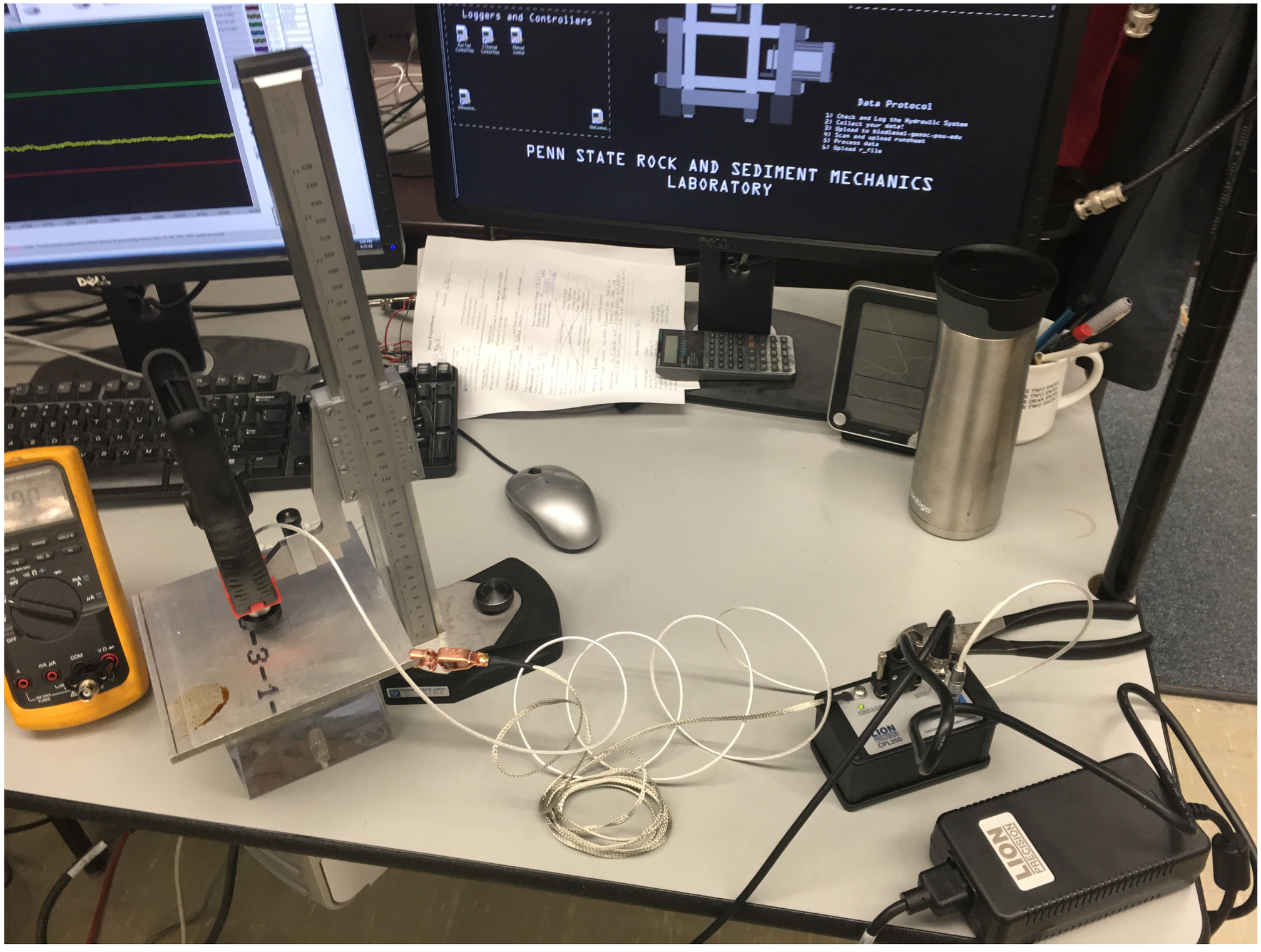

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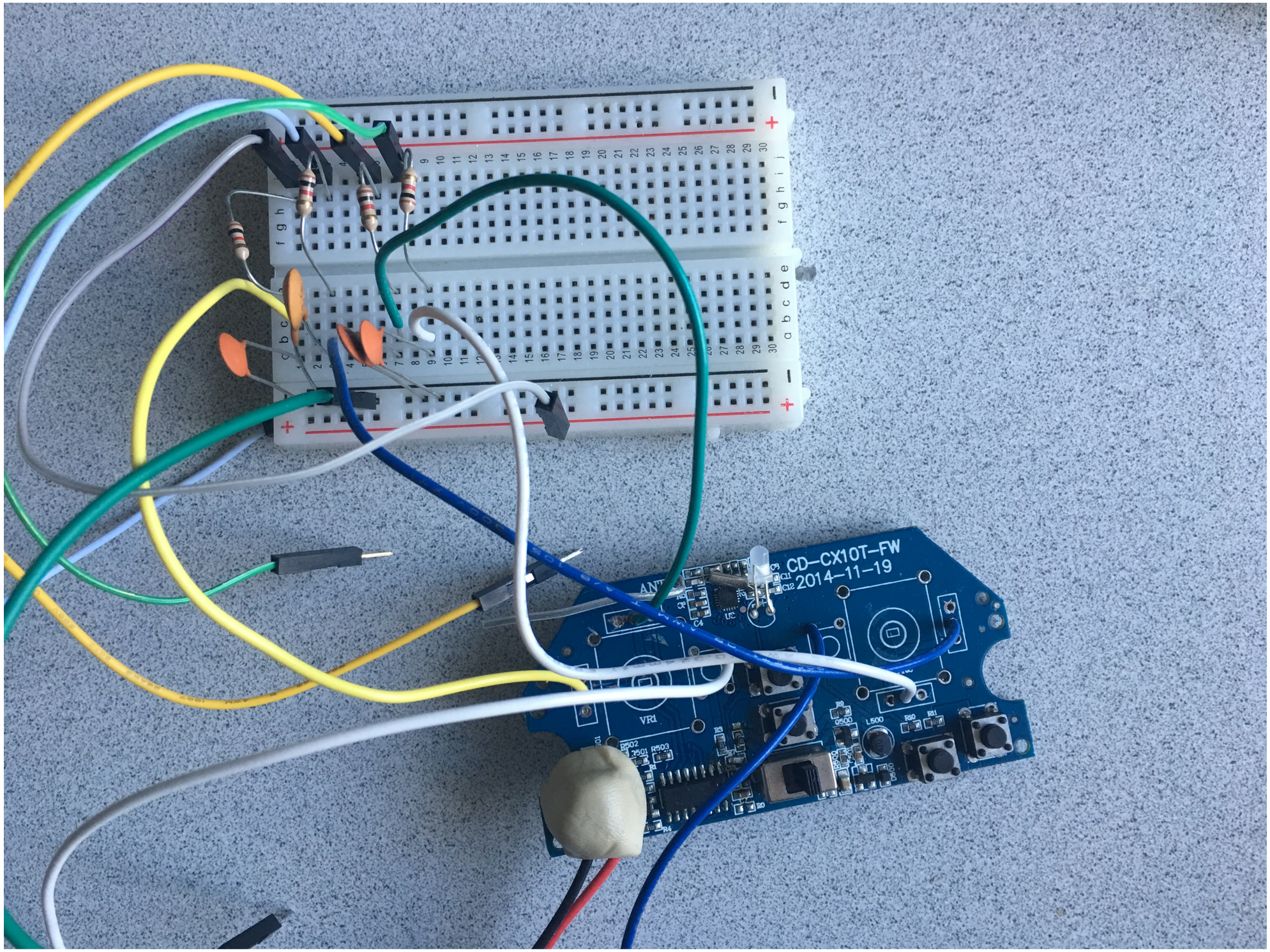

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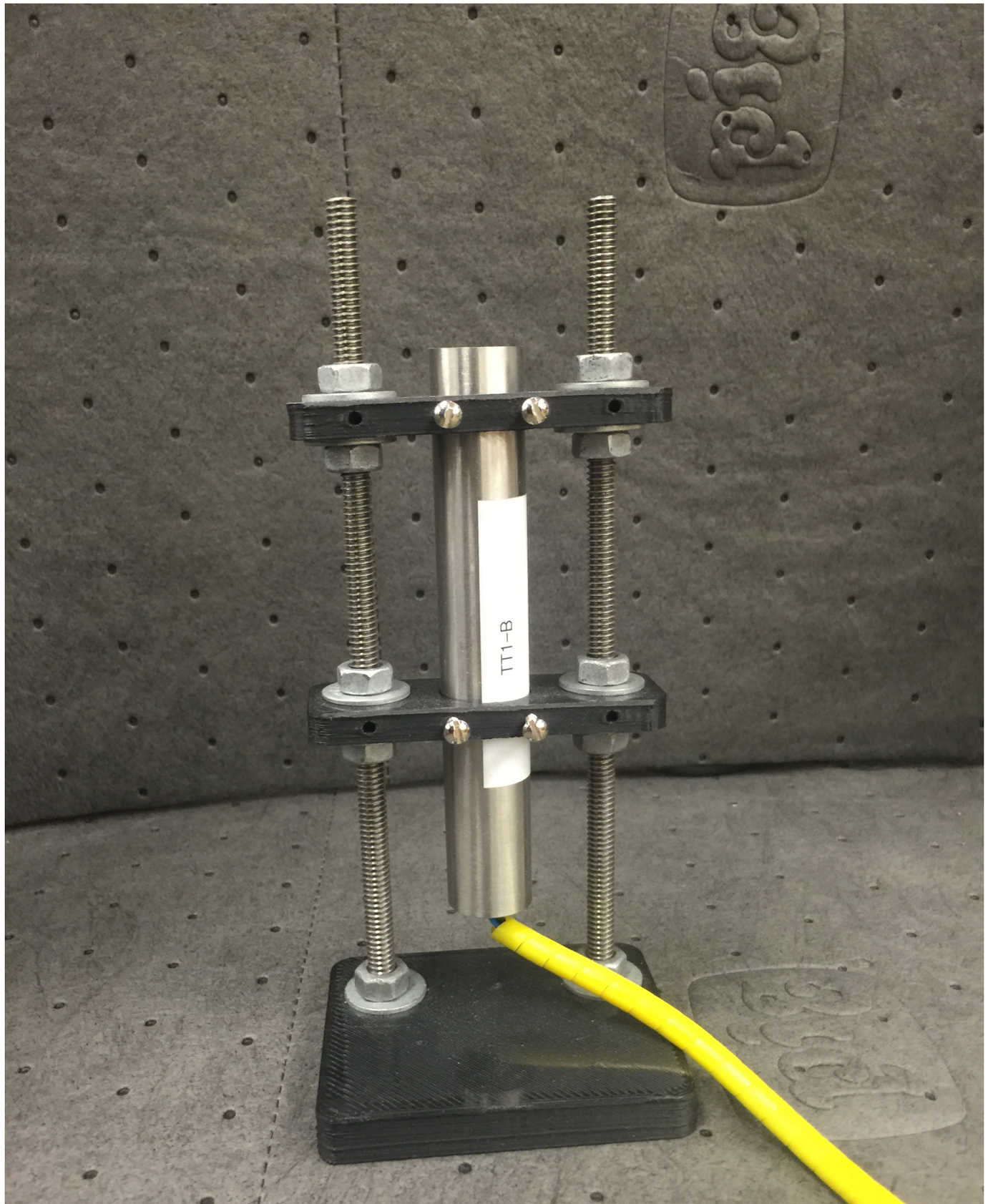

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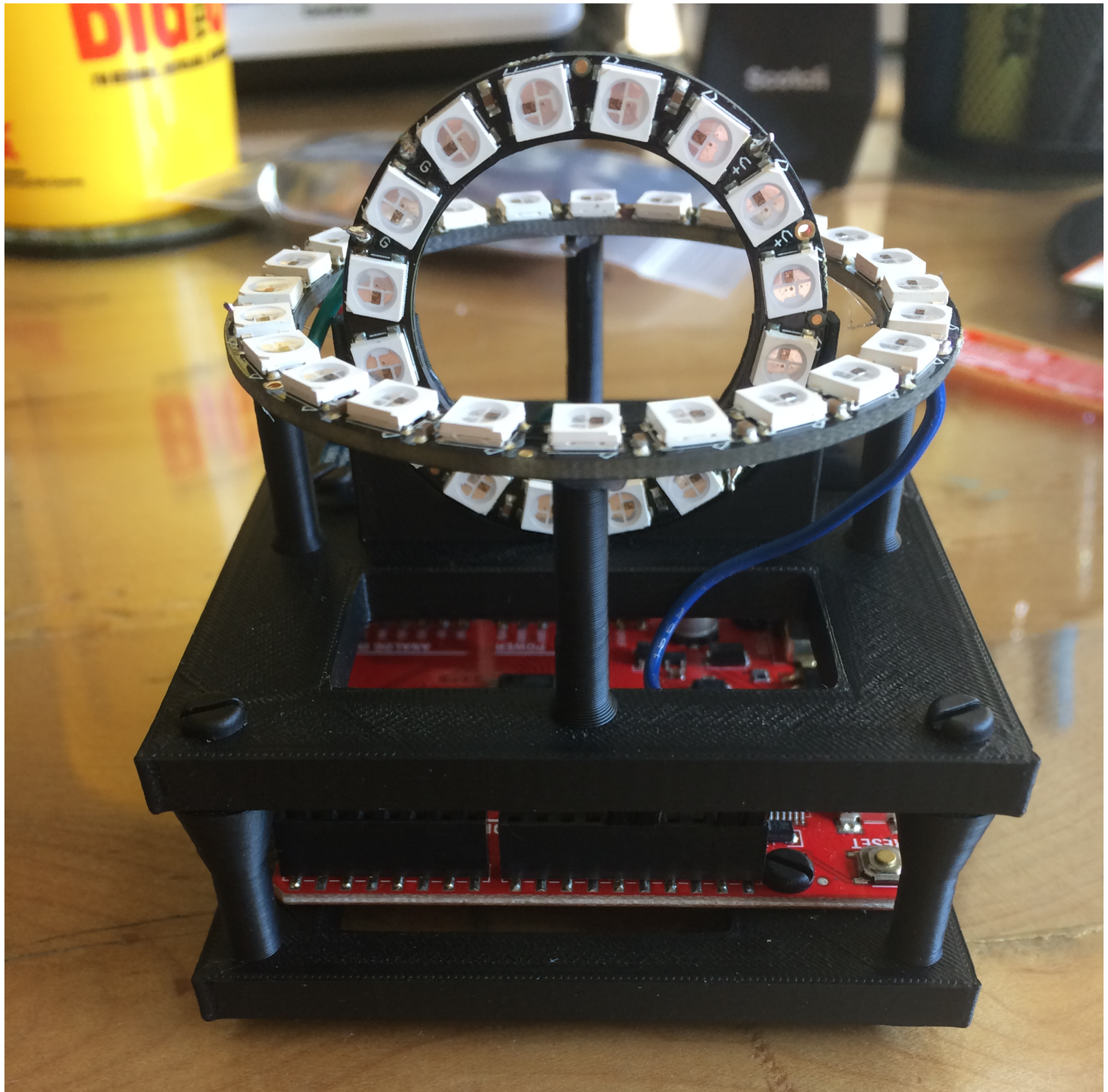

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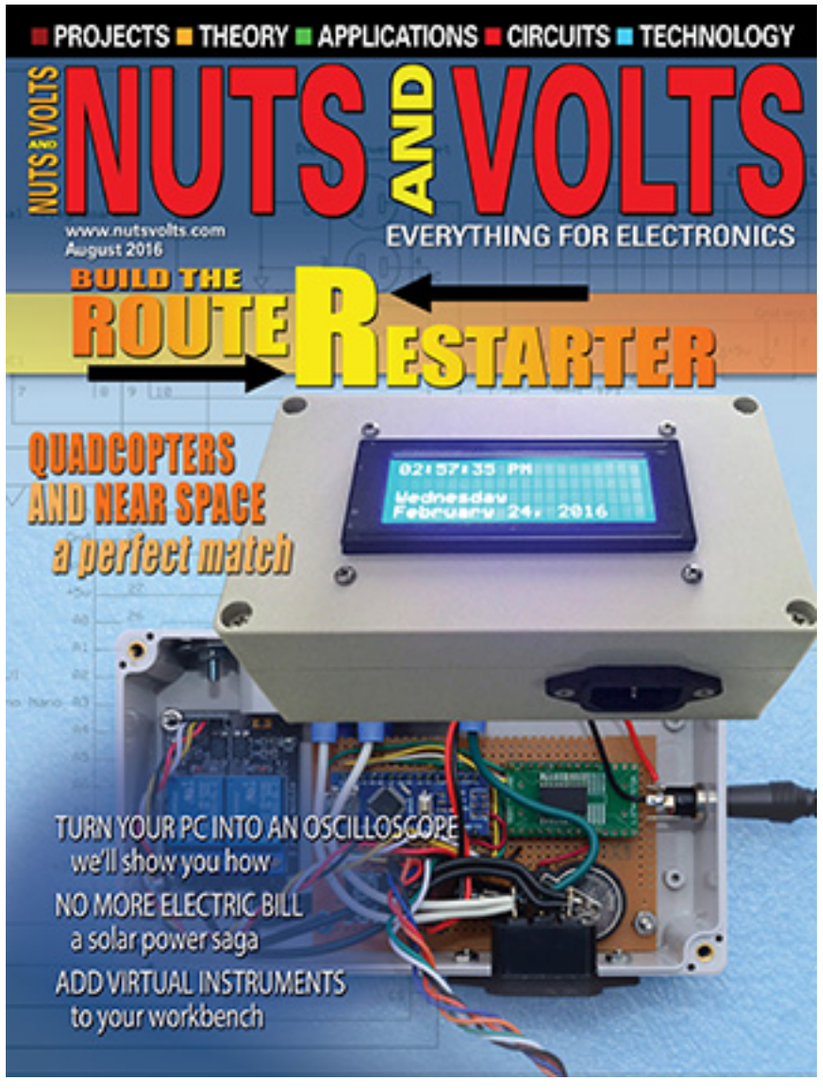
Sources of inspiration are everywhere



HACK A DAY

YouTube

Make:

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

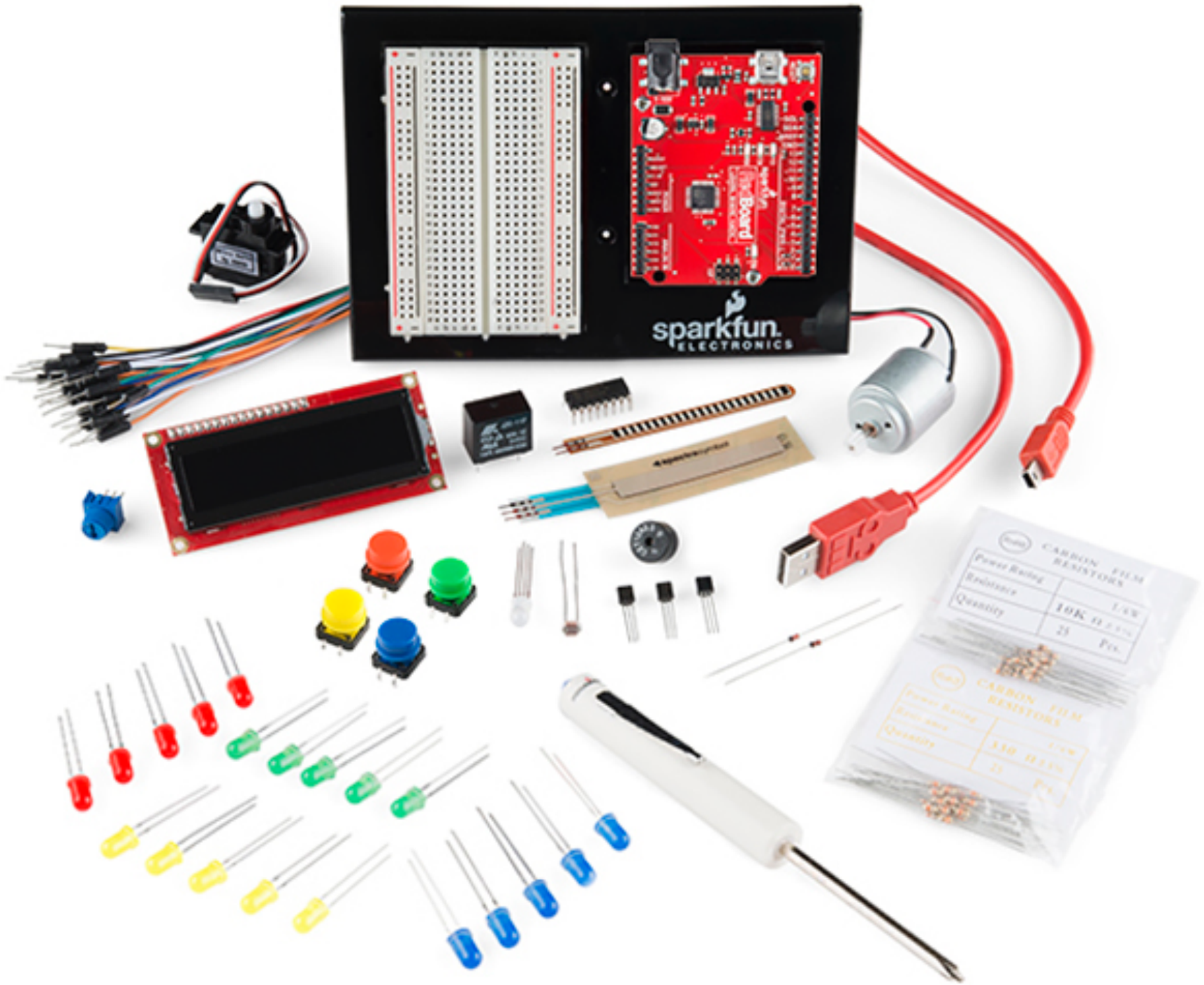


Image: sparkfun.com

Activity: Blinky 1.0

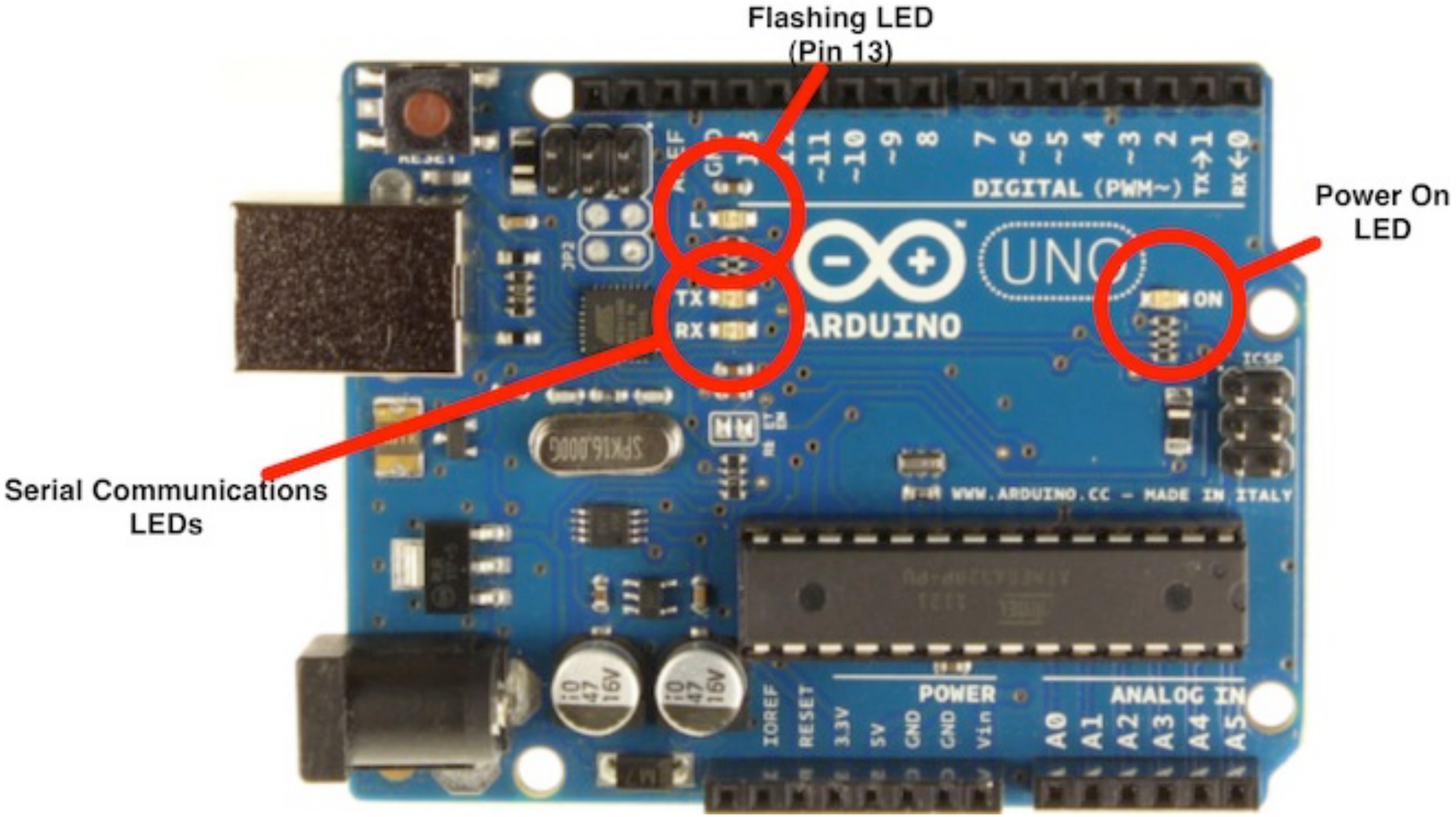


Image: geekdad.com

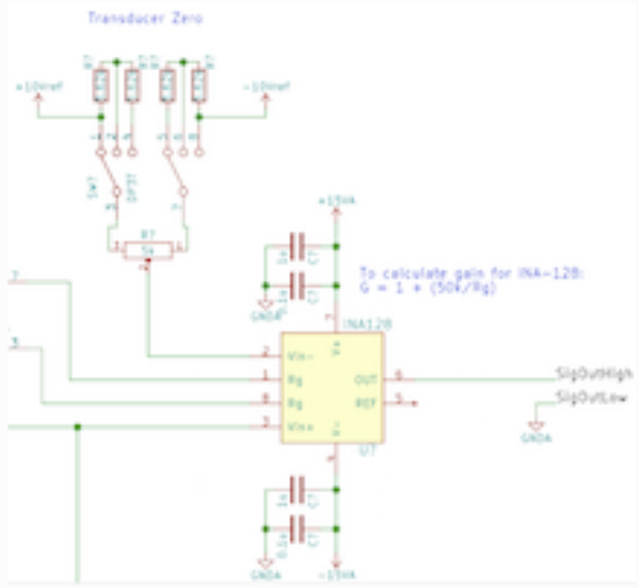
Assignment: Project Brainstorm

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 trail 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:



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Brainstorm 5 potential project ideas.

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