

Hi

Burnaby

Mountain!

Engineering at UBC

This presentation is already online.

Google

“UBC Engineering Burnaby Mountain”

Jon Nakane, PhD PEng
Lab Director, UBC Engineering Physics Project Lab
Burnaby Mountain School – 2013 April 18

- What is Engineering?
- How is it different than Science?
- Skills and aptitudes that we look for in students.
- Engineering careers
- Prototyping tools

Departments and Schools:

Chemical & Biological Engineering

Civil Engineering

Electrical & Computer Engineering

Materials Engineering

Mechanical Engineering

Mining Engineering

UBC Okanagan Engineering

Non-department Programs

Biomedical Engineering

Engineering Physics

Environmental Engineering

Geological Engineering

Integrated Engineering

Common first year for APSC students, then learn about different options throughout the year.

Can also transfer in from other faculties (arts/science) after 1st year.

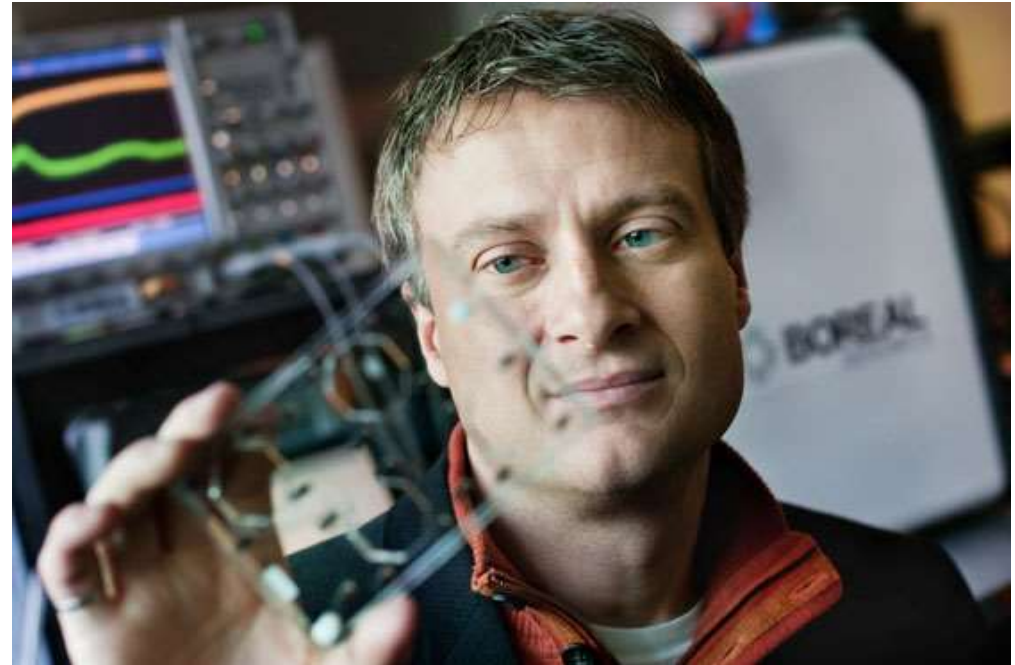
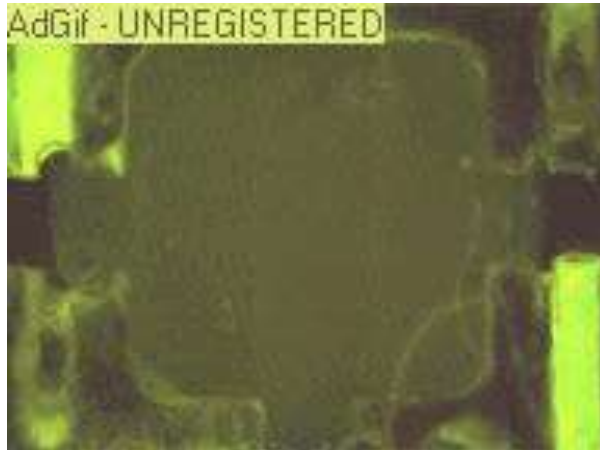
Think of it as an Applied Physics degree
Math + Physics + a background in one of:

- Electrical Engineering
- Mechanical Engineering
- Computer Science
- Mechatronic Science

1.

What do Engineers Do?

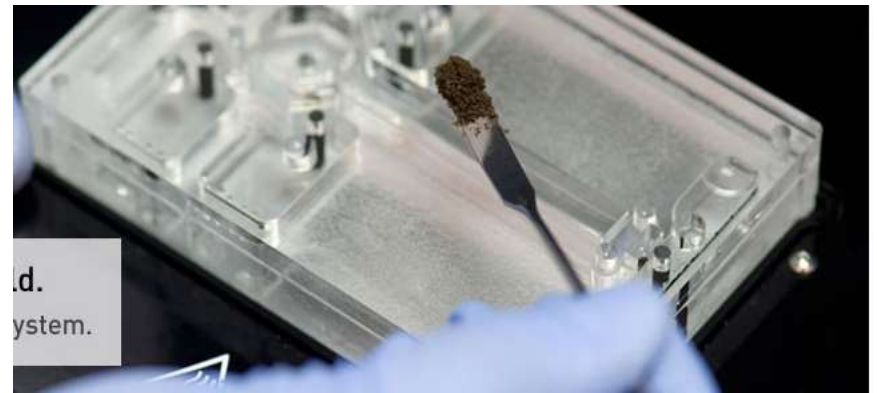
Biomedical



Name: Andre Marziali

Job Title: President and CSO, Boreal Genomics
(and current UBC Engphys Program Director)

Technique for
concentrating
highly dilute
quantities of DNA



Energy



Name: Lauren Kulokas

Job Title: Chief Operating Officer (2005-12)

Company: Energy Aware Technology Inc.



The PowerTab App

The days of waiting for your energy bills are over. The PowerTab App gives you real-time information about your energy use and ways to get your bill down before it's too late.

[LEARN MORE »](#)



Energy

Name: Justin Lemire-Elmore

Company: Founder, GRIN Technology

In 2008, rode his electric bike across Canada.
Took 30 days.
Used less than \$10 in electricity for the whole trip.



Energy

Name: Justin Lemire-Elmore

Company: Founder, GRIN Technology

Started own electric bike company.



A screenshot of a web browser displaying the ebikes.ca website. The browser's address bar shows the URL http://www.ebikes.ca/store/store_ezee.php. The website's header features a logo of a person riding a bicycle with a lightning bolt, and the tagline "Thinking Outside the Four-Wheeled Box" above the domain name "ebikes.ca". Below the header is a navigation menu with links for Home, FAQ, Contact Us, Cycle Analyst Info, Lights Info, Tech Info, Troubleshooting, Projects, Events, Store, and Simulator. A search bar and a "View Cart 0" button are also visible. The main content area displays the "eZee Bike Conversion Kit" product page, which includes a photograph of the kit components: a bicycle wheel with a motor, a battery pack, a headlight, and other accessories.

Energy



Soon, our sign here



Started own electric bike company.
Store at Main and 4th Ave in Vancouver
~10-15 employees.

Engineering as Creative Expression

Vancouver Junkyard Wars

Pumpkin Cannon Test Launch - Vancouver Junkyard Wars 2009

rsteves00 6 videos



969 views



Automatic pancake maker - 2002

First Prototype built in 48 hours





Engineers Work Everywhere.

BC Hydro

PMC-Sierra (internet network chips)

Pulse Energy (energy management)

Lumerical Solutions (electric-field simulation)

Electronic Arts

Microsoft

Google (hardware development)

HSBC (strategy analyst)

REV Engineering (electric Vehicles)

Starfish Medical (prototype devices)

Elect Energy Services, Vancouver2010

Qualcomm (USB designer)

Advanced Cyclotron / BEST Cyclotron (for medical devices)

Boreal Genomics (UBC start-up)

Sandwell Engineering (mech consulting)

2.

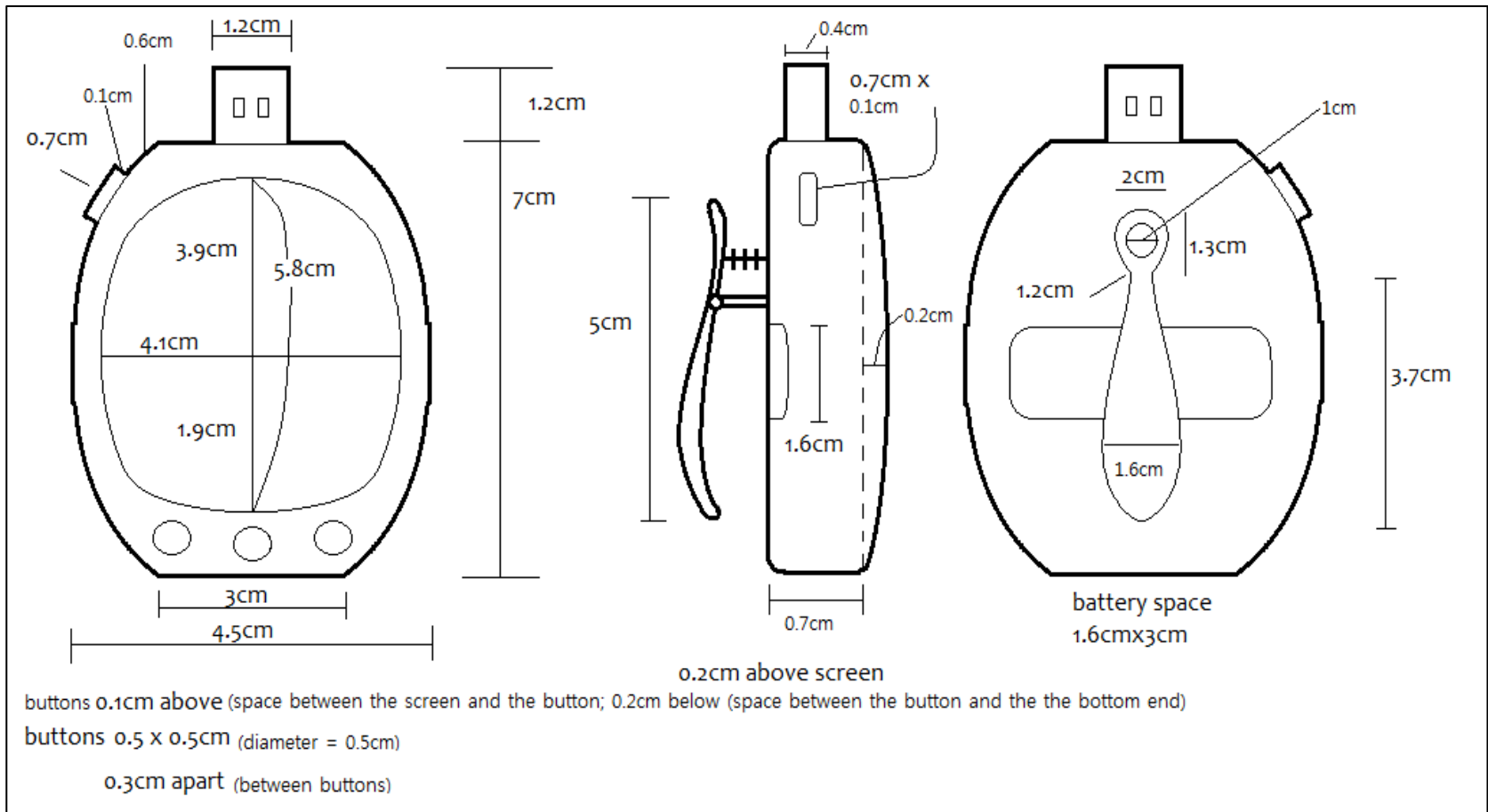
Tools for prototyping

The Apple I - 1975

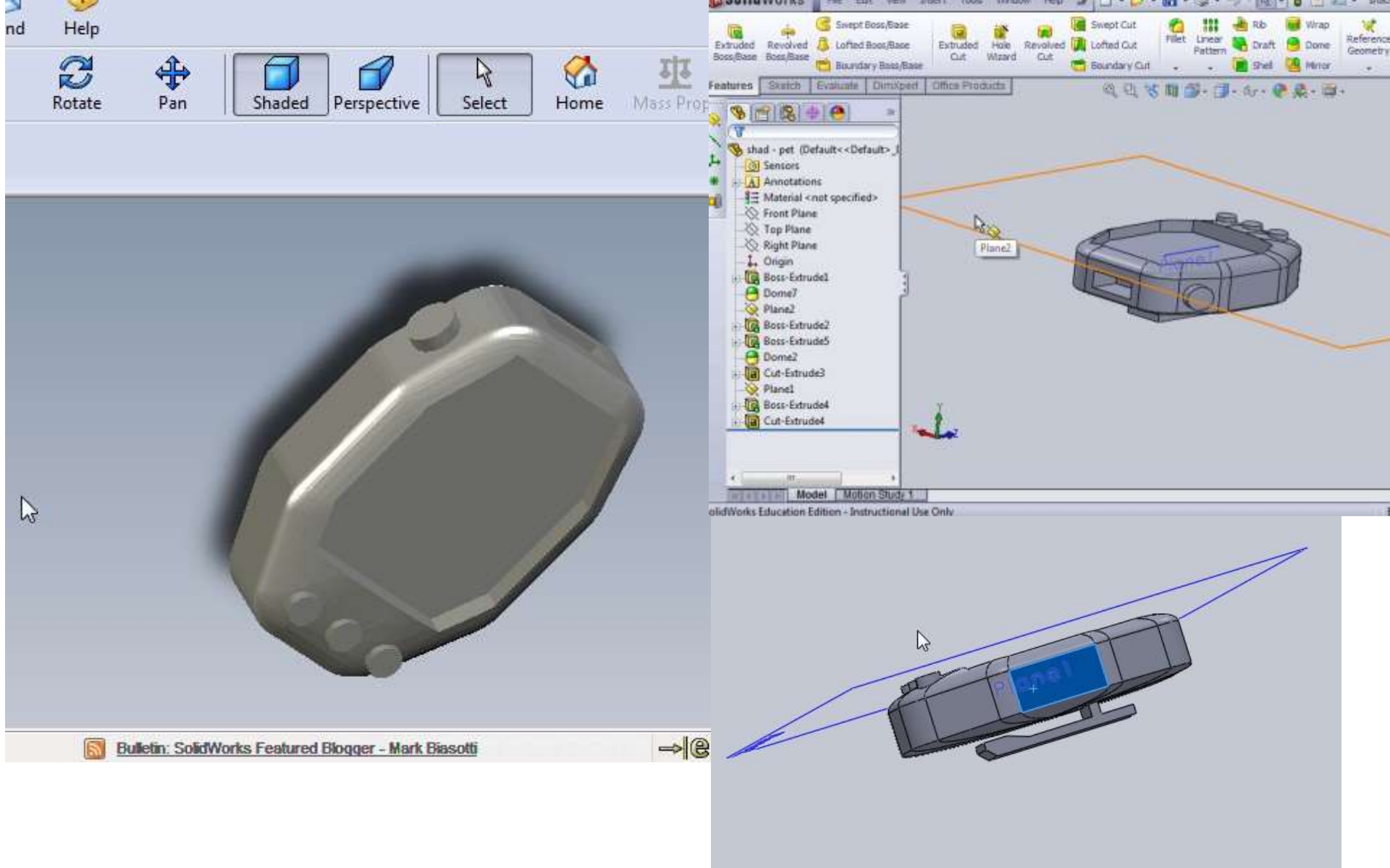


The Apple I - 1975

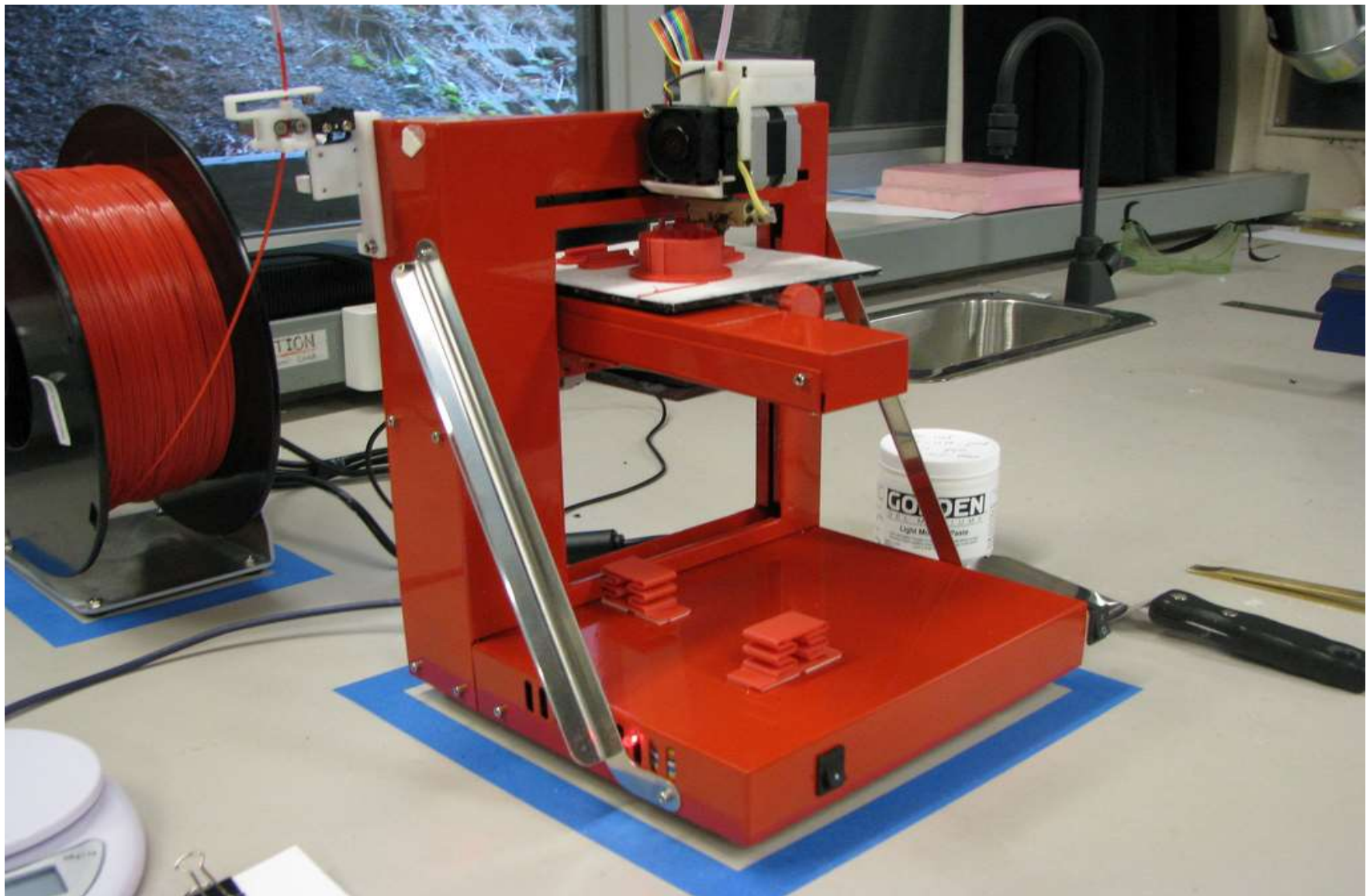




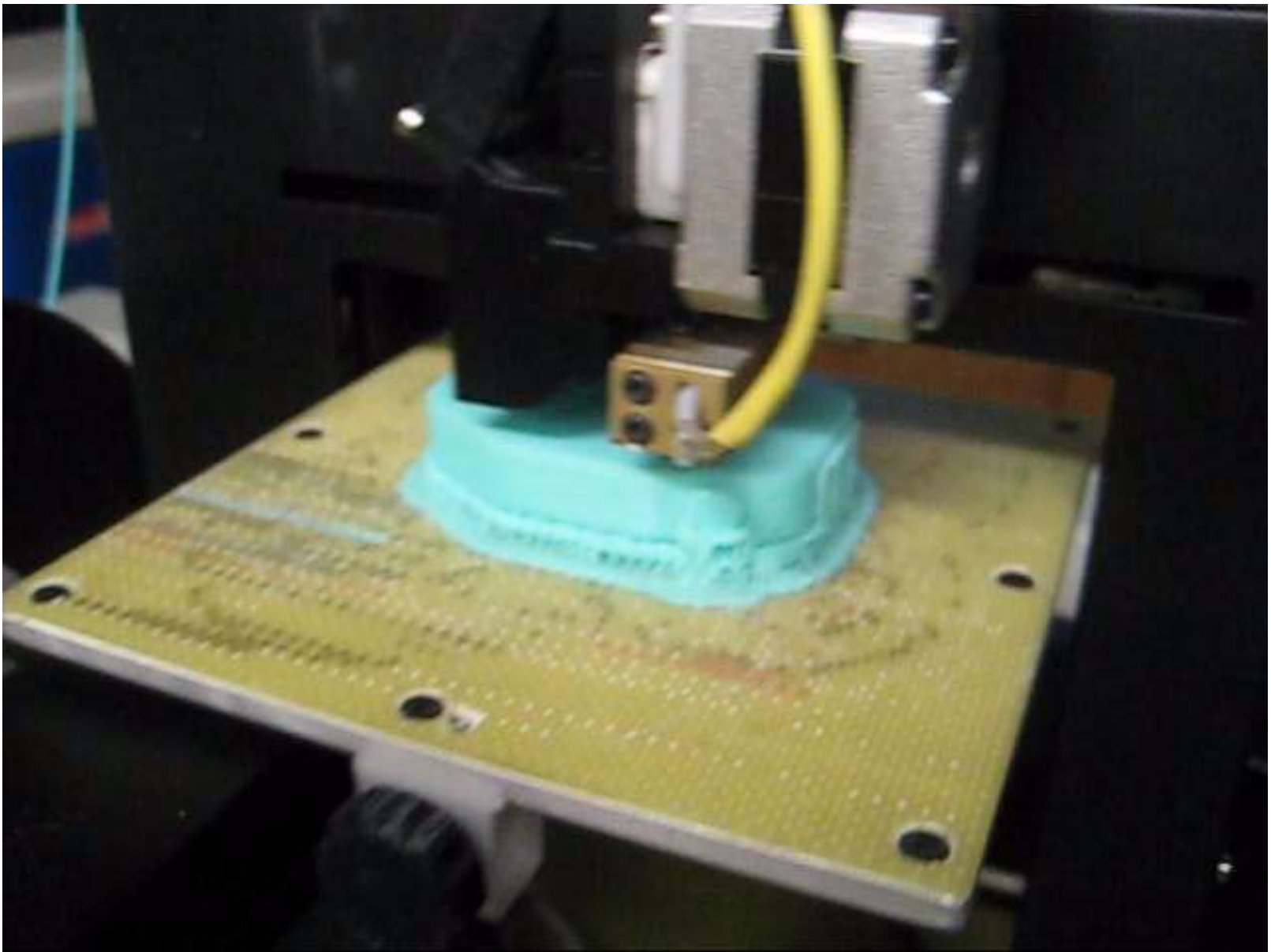
Example – handheld interactive “pet” to encourage kids to be active. Physical model desired (non-functional ok). Students supplied drawings (I think it’s MS Paint?)



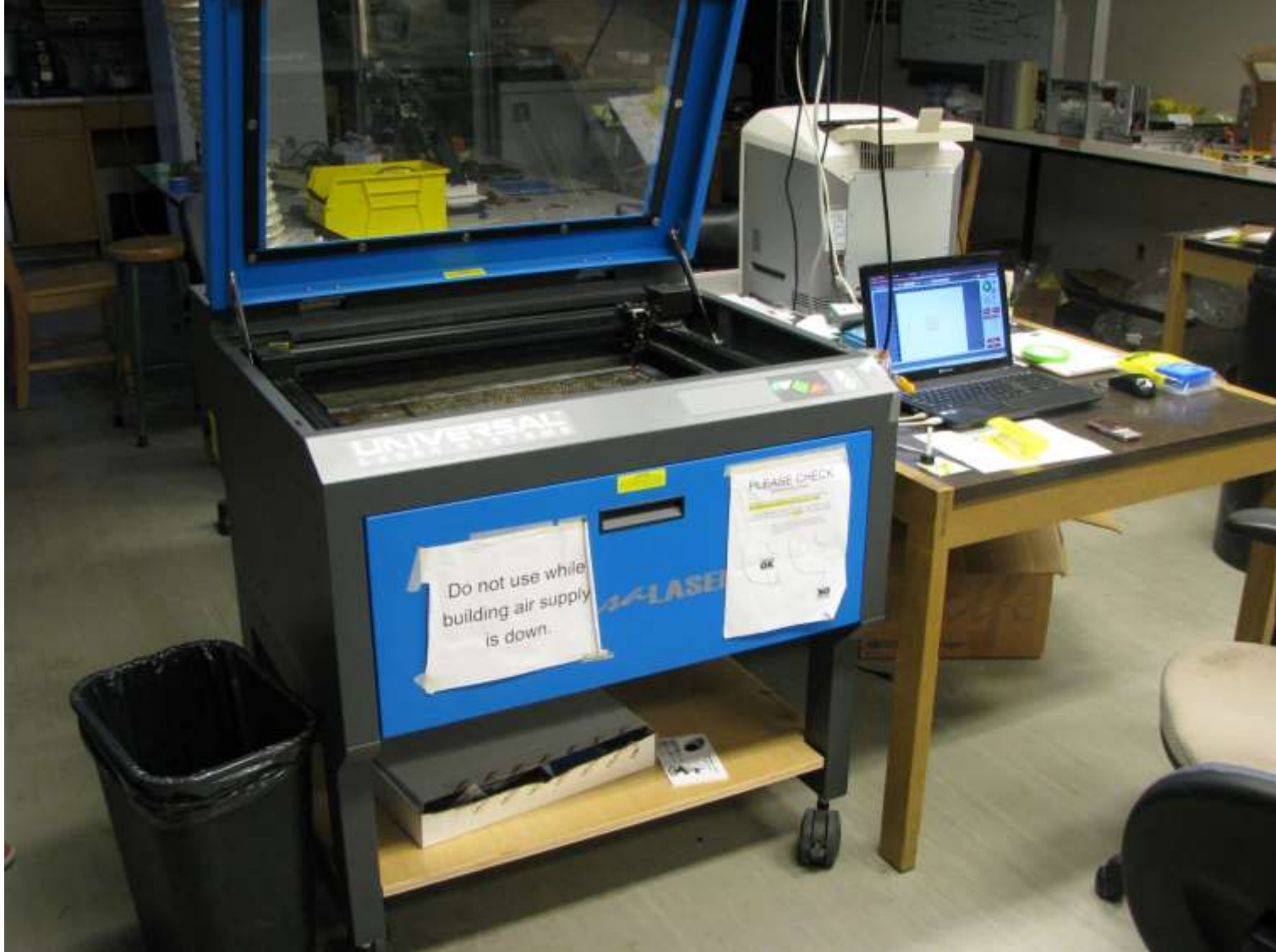
Converted to Computer Aided Design (CAD) software (solidworks)



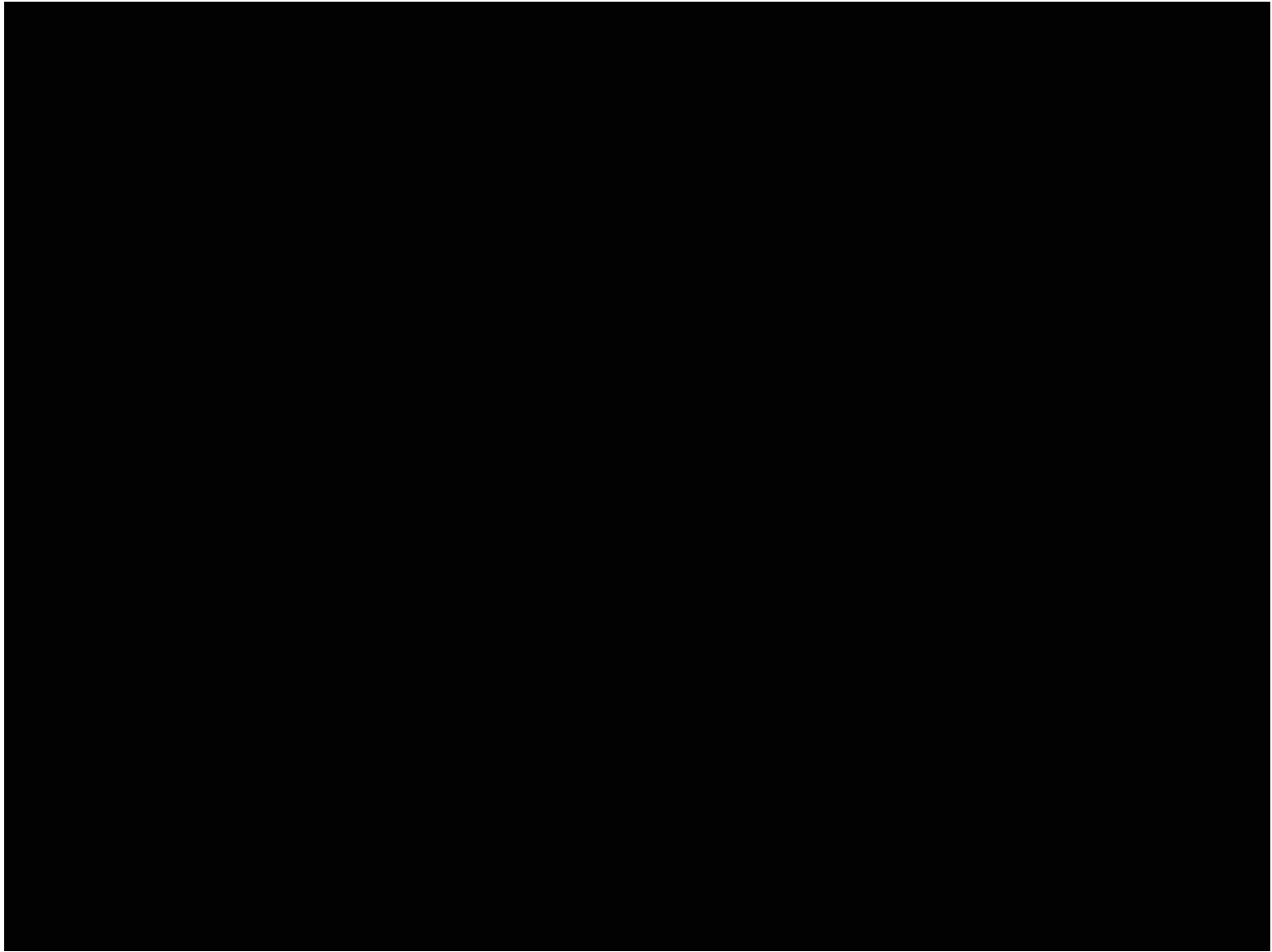
Housing printed on a 3D Printer – uses ABS plastic



3D printing - video



**Faceplate cut out of plexiglass on a Laser Cutter
– good for plastics, wood, paper, etching...**



Laser cutting a sheet of plexiglass (video)



Finished – idea on Thurs night, completed on Sun night.



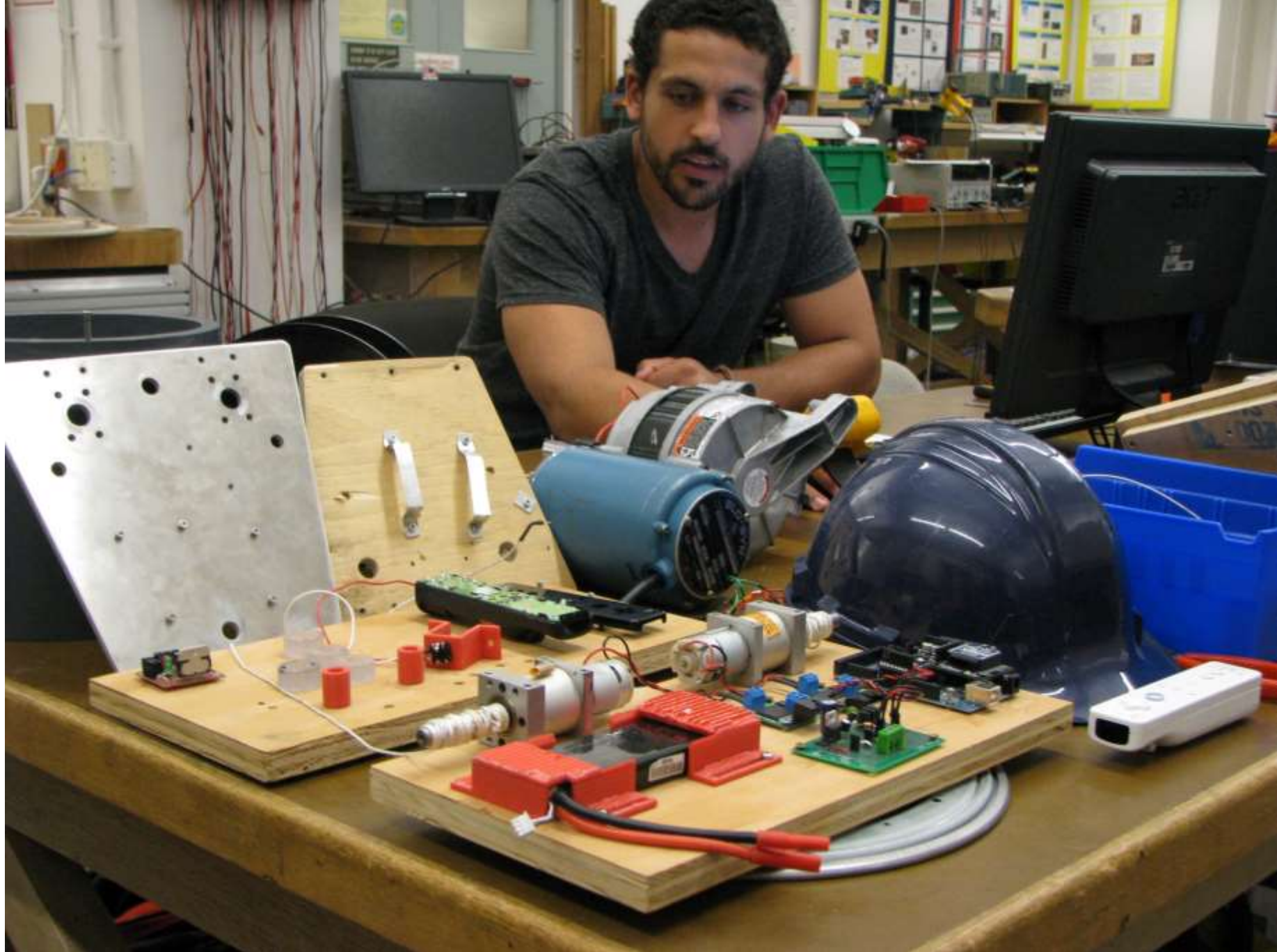
Example:

Autonomous kite for wind power generation
Self-sponsored Entrepreneurial Project
9 academic credits + financial support

Kite Power
ENPH 479/EECE 496

Remote Controlled Flight Testing
February 21, 2013 - Steveston BC, Canada

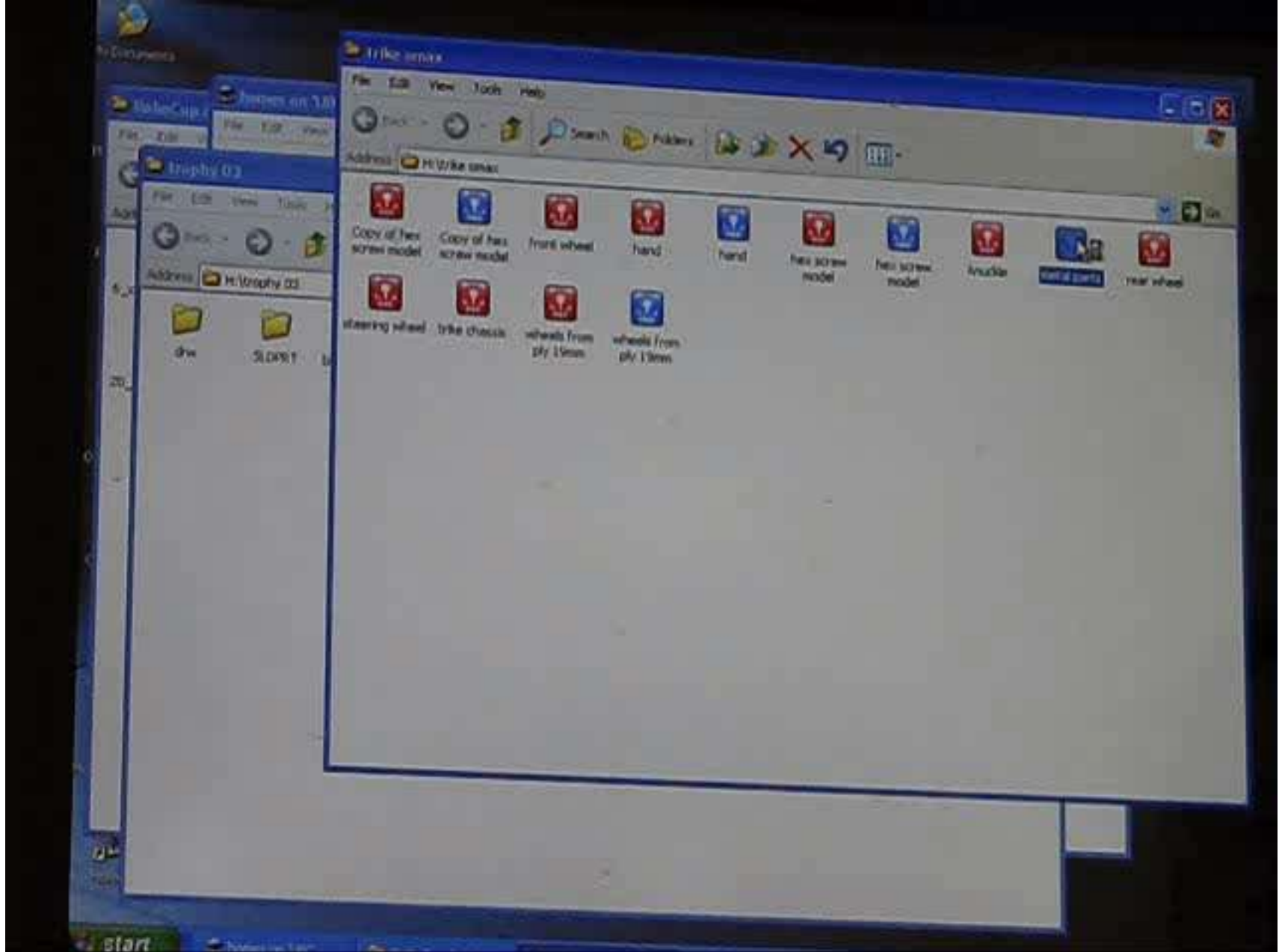
Kite video



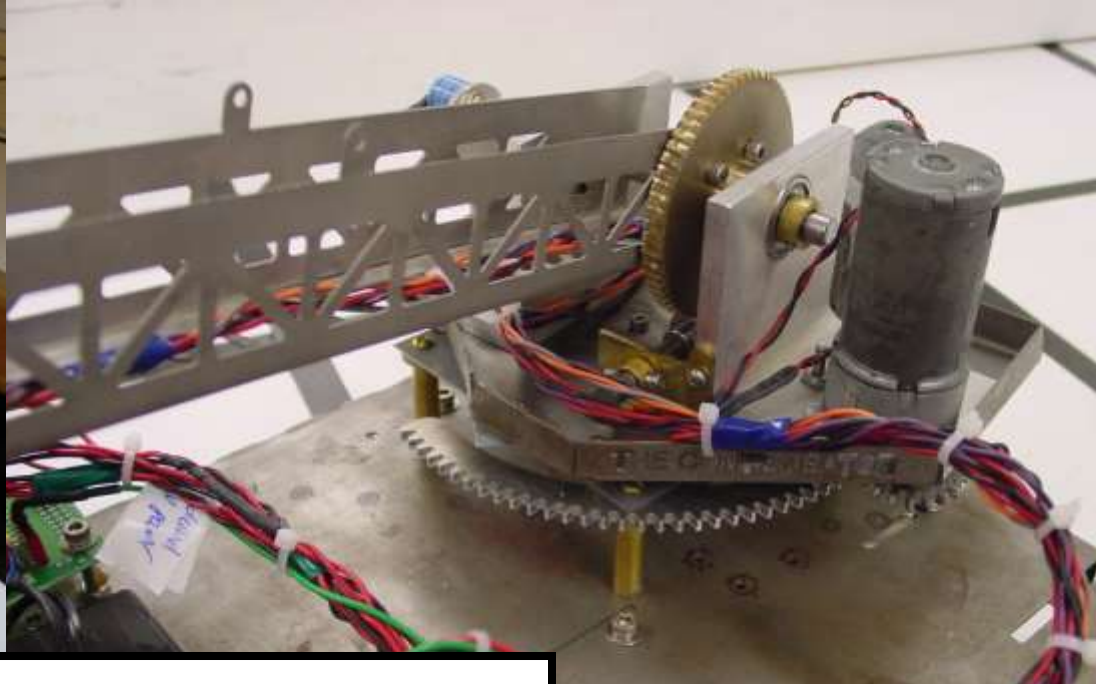
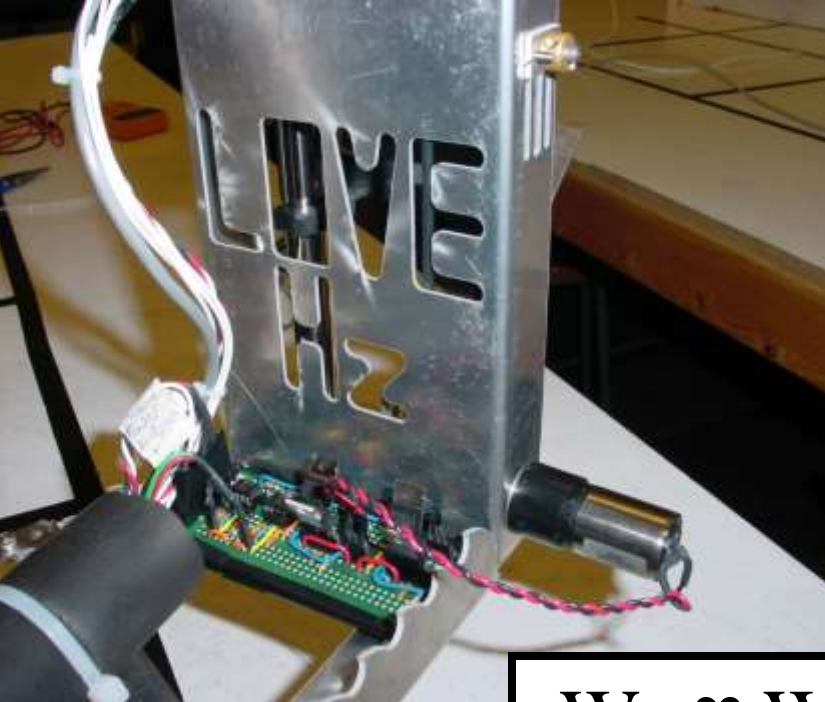
WaterJet cutter

- Our most versatile prototyping machine
- Cuts everything

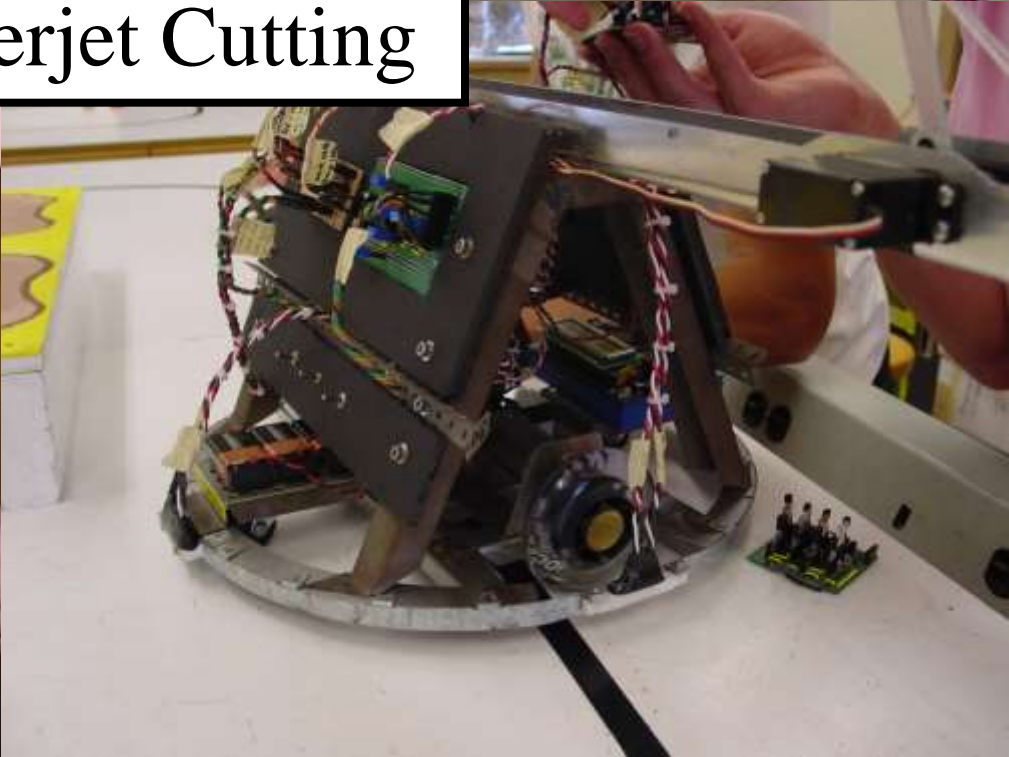


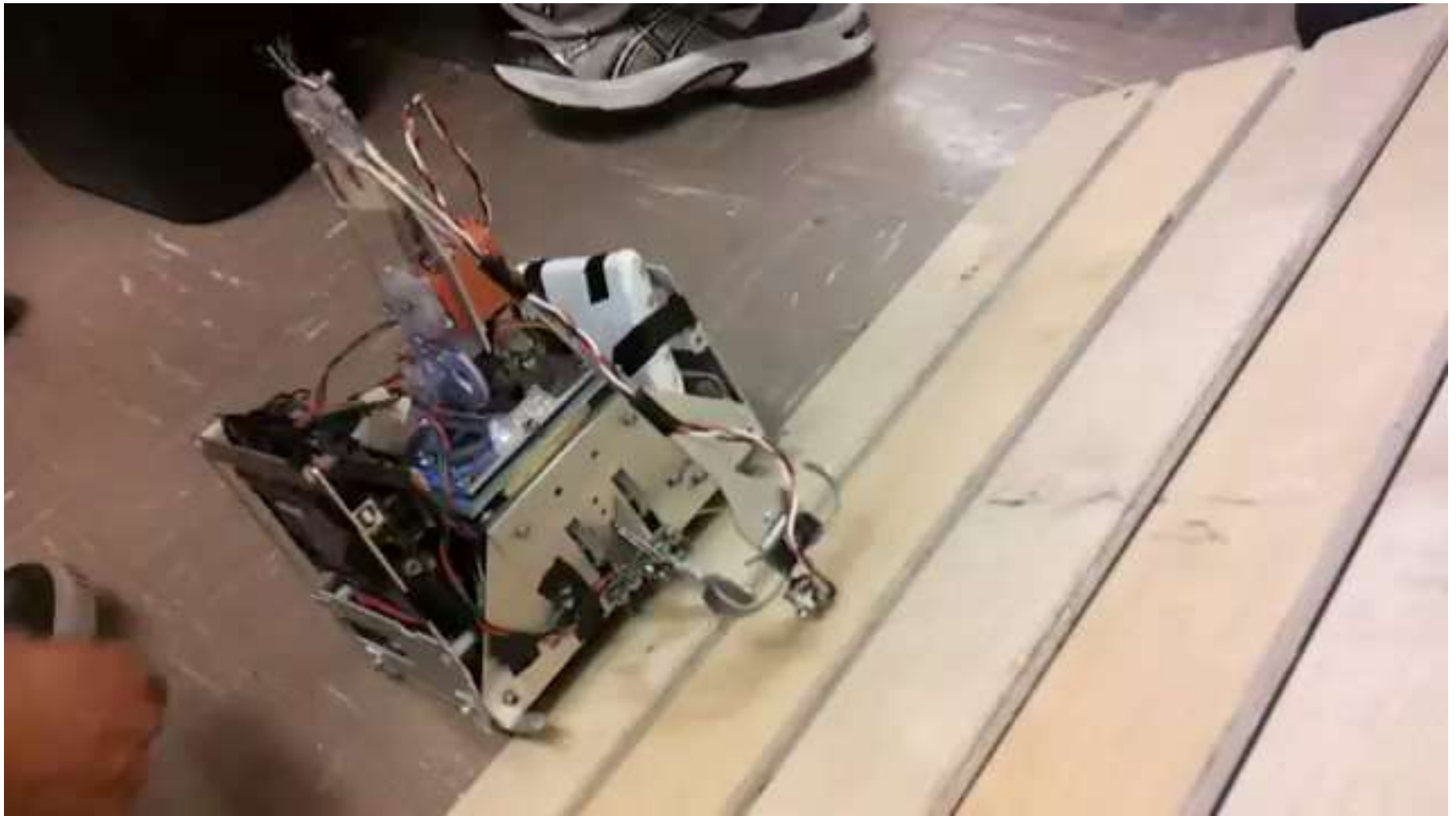


Waterjet Cutter - video



We ♥ Waterjet Cutting

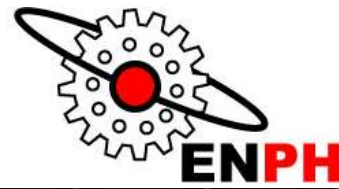




**Course for 2nd year Engineering Physics students
Summer 2011 – Climber-Bots**



How to get in...



- **You can enter Eng Phys from (in order of preference):**
 - UBC 1st Year Applied Science (Engineering)
 - UBC 1st Year Science, or Science 1
 - One of five local colleges offering Engineering Exchange programs: Capilano, Kwantlen, Langara, Douglas, UCFV.
 - You can transfer from another college or university.
- **Entry to UBC 1st Year Applied Science (Engineering)**
 - About 800 students are accepted each year.
 - Your marks in Physics, Math, Chemistry, and English count.
 - Your average should be well above 80% (cutoff is in the low '80s)
- **Entry to Engineering Physics**
 - After 1st Year Applied Science or Science, you select Eng Phys for 2nd year.
 - We select the top 60 applicants, using a mixture of 1st year marks and a broad-based admissions process.
 - Minimum mark (in 1st year) is around 70% (may vary based on demand)