

ENPH 253

Intro to Instrument Design

Google ENPH 253 kickoff 2018

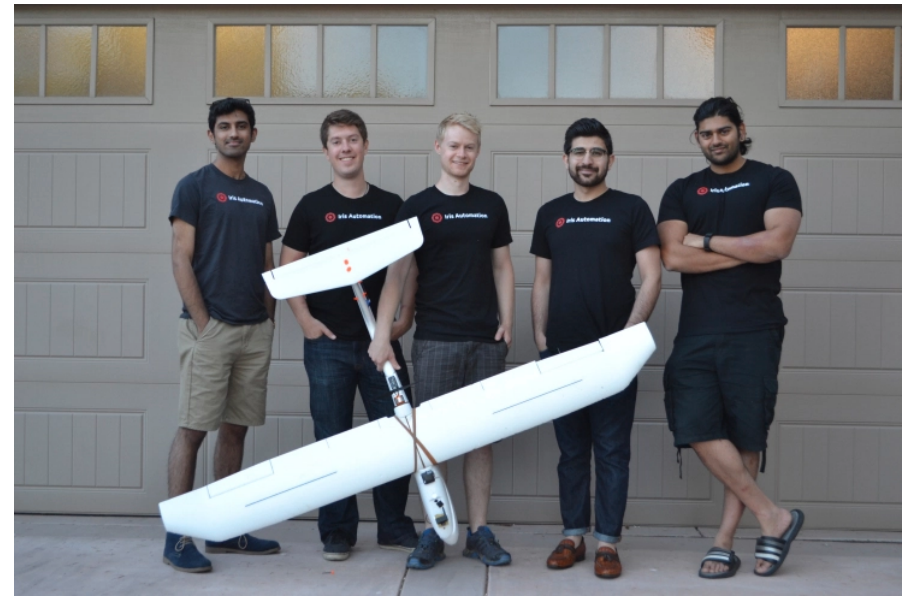
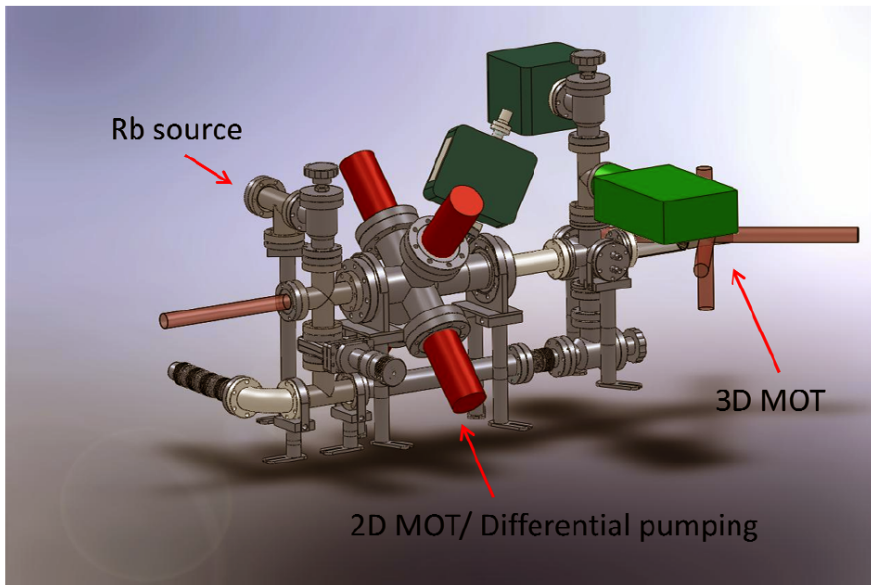
Bernhard Zender / Andre Marziali / TBD
UBC Engineering Physics Project Lab
2017 Nov 9

1. Example Senior Projects

2. ENPH 253

3. How you can get ready
for summer

1. Examples of Senior Projects (enph 459 and 479)

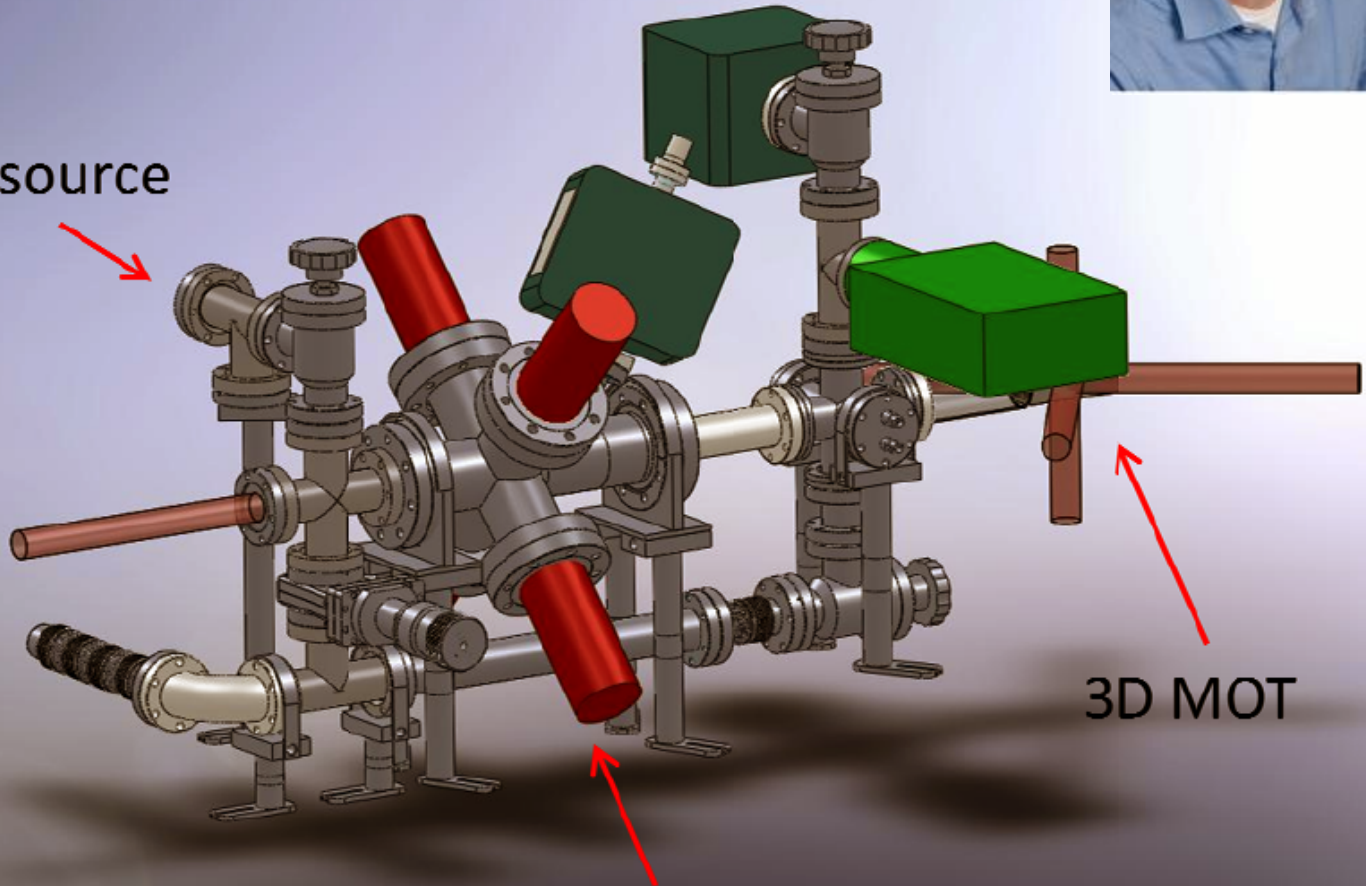


2D Magneto-Optical Trap

(Kirk Madison)



Rb source



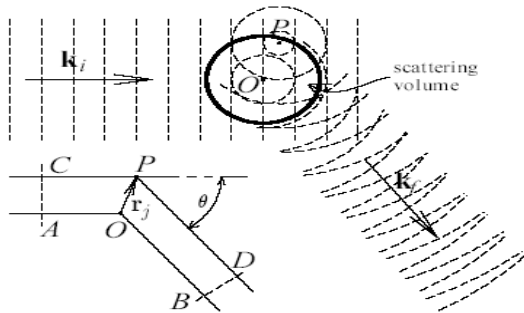
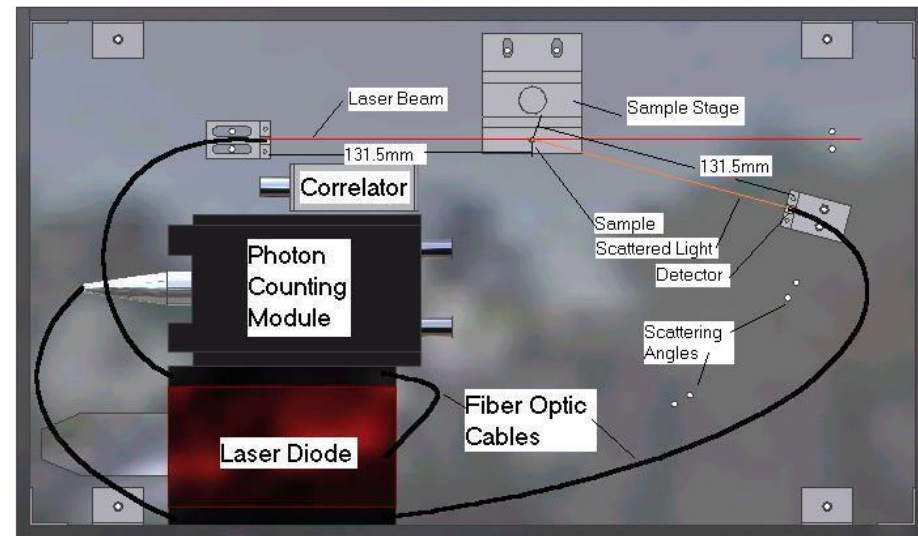
3D MOT

2D MOT/ Differential pumping

Dynamic Light Scattering Prototype for Measuring Platelet Quality (Elisabeth Maurer)



Canadian Blood Services
Société canadienne du sang

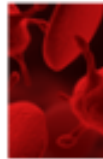
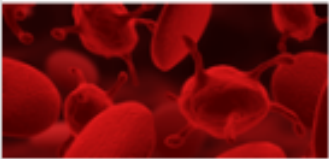




LightIntegra
TECHNOLOGY

Company started based
using 479 prototype

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Platelets save lives. **We save platelets.**

ThromboLUX™ is a quick and simple diagnostic test for platelet quality and function that will make it easy to screen platelets prior to transfusion.

Traditional methods of platelet quality testing are unreliable, time consuming, expensive and not used routinely. LightIntegra intends to make platelet quality testing a regular practice in blood banks around the world by making it accessible, affordable, reliable and fast.



Electric conversion of mini cooper (there was mini cooper in Hennings)



Iris Automation - Industrial Drone Object Avoidance



What is Iris? Technol



Aircraft: 600m

THE FUTURE IN SIGHT

Safer drones with collision avoidance

Be an Early Adopter

c. List of Projects

1. [%] Optical fiber polishing station with real-time microscopic inspection capability (Jones)
2. Solar Blind Extreme Ultraviolet (XUV) Detectors (Jones)
3. [&] Magnetic Resonance Imaging Field Stabilizer (Michal)
4. Circular Saw Vibration Frequency and Mode Shape Indicator (Schajer)
5. Accurate drug dosing in children (AnserminoDumontLarson)
6. Five projects from Zaber (Zaber Technologies)
7. [&] Pan & Tilt Drop Camera (Dennison/HarveyClark)
8. Bidirectional Single Cable Power and Signal to ROV (Dennison/HarveyClark)
9. ROV (Dennison/HarveyClark)
10. Inkjet micropatterning process for nanostructured field emission displays (Wang/Walus)
11. Acoustic Imaging (Waltham)
12. [&] Field Test and Modify Plumbing Endoscope for Seawater Deployment (MarliaveVanAqua)
13. Development of an electric bike mapping, performance analysis, and visualization program (C)
14. Building acoustical-environment monitoring system (Hodgson)
15. [&] Robotic Origami (Olson)
16. Design and construction of an instrument for 2D conductivity mapping of nanocomposite film

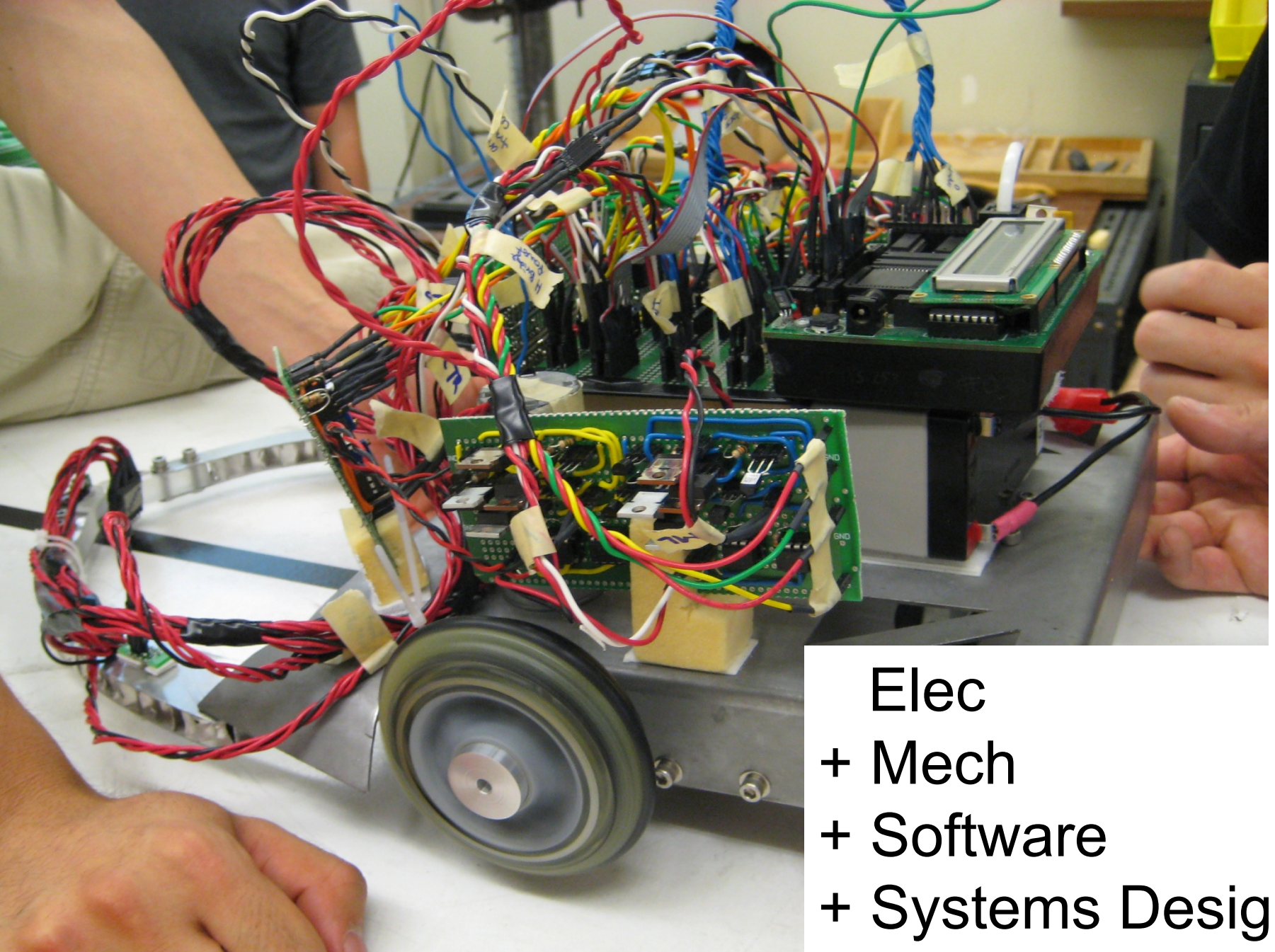
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- 75+ available projects from Faculty & Industry Sponsors
- Self-sponsored projects can be done for credit, funding (e.g. \$10,000 Bycast Award for ENPH students)

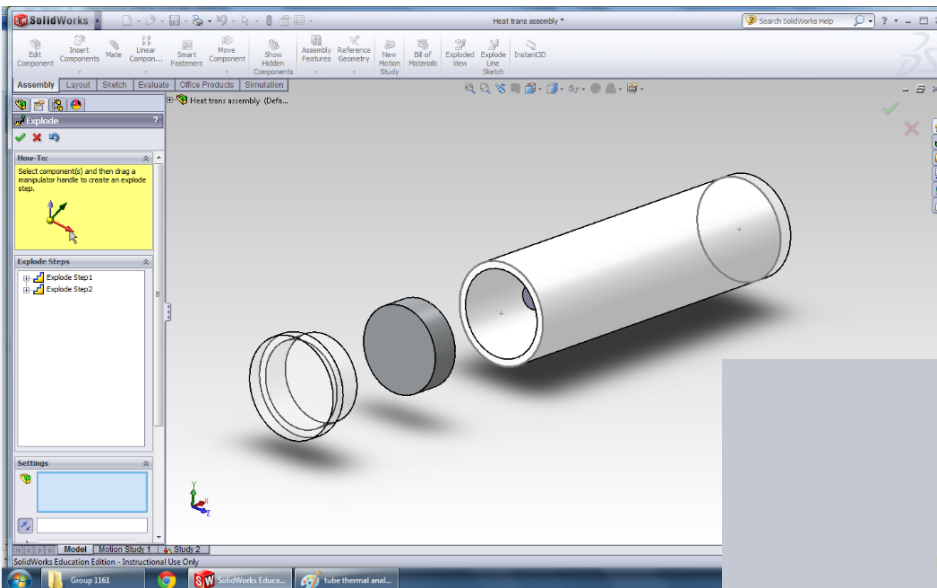
2.

ENPH 253

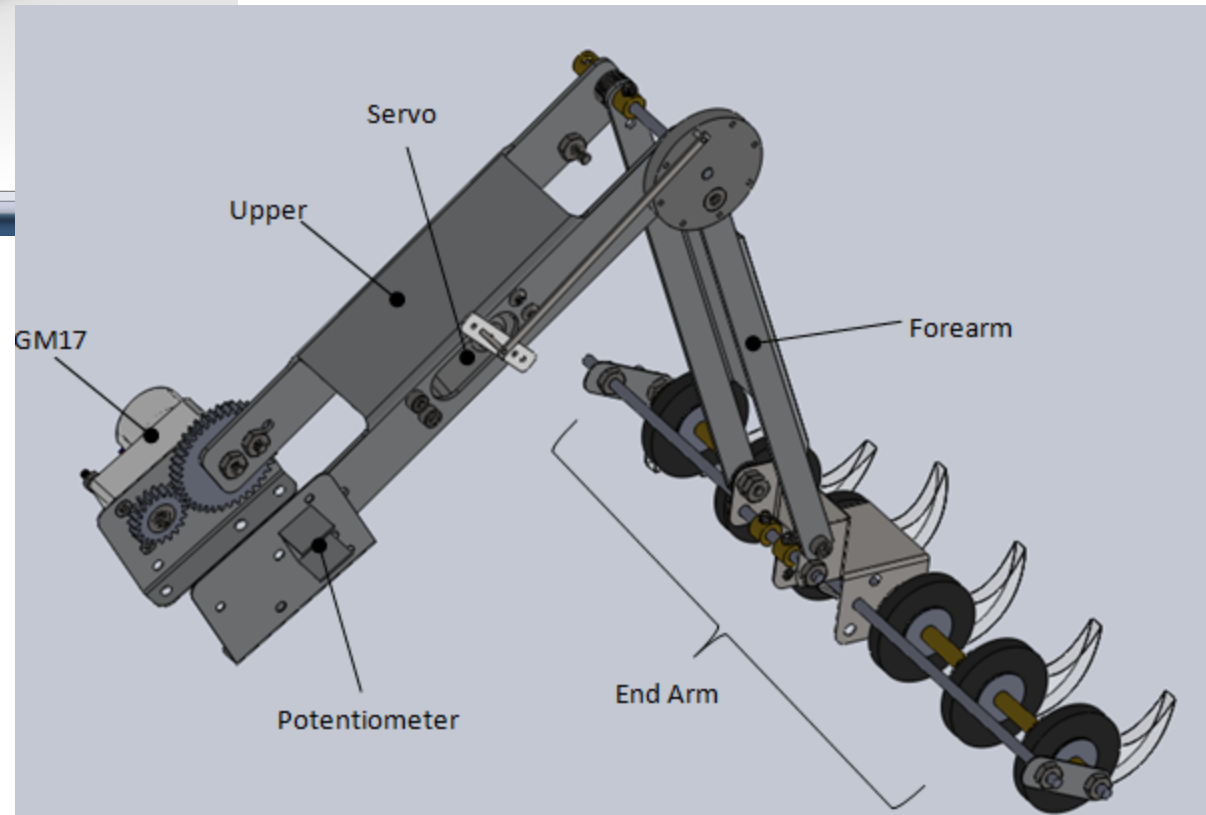


Elec
+ Mech
+ Software
+ Systems Design

Solidworks

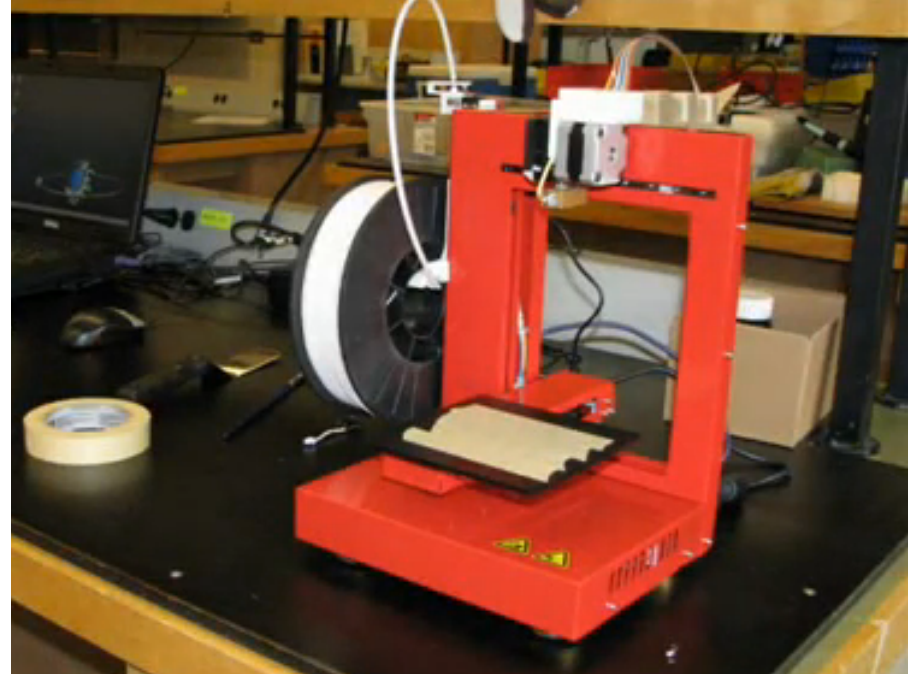


You can download the software from the link provided on Kickoff webpage.





WaterJet cutter



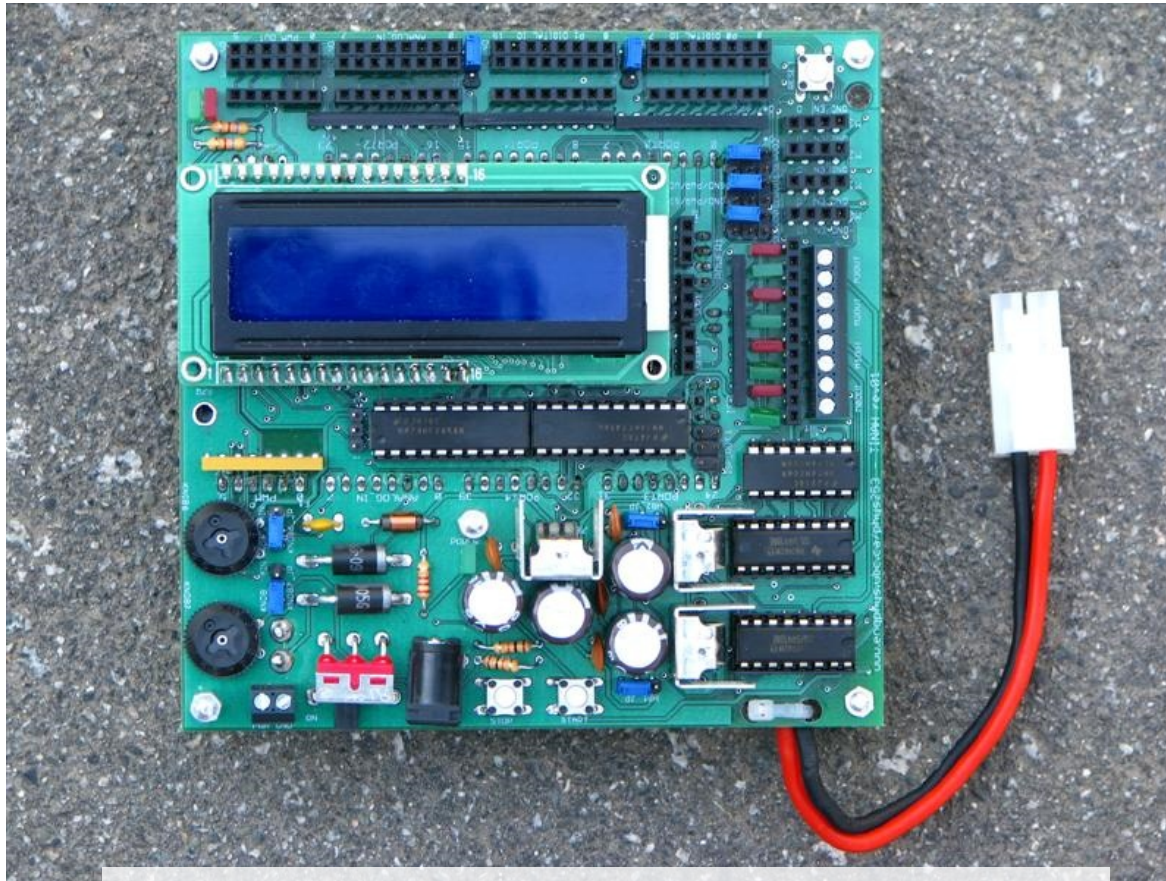
3D printers



50w Laser Cutter

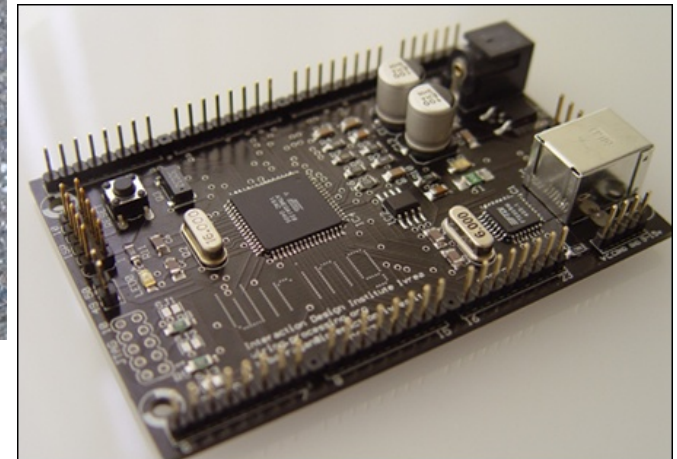
+ 10hr introduction to Student Machine Shop + sheet-metal tools + spot welder + powder coating + hand tools

Programming / Control



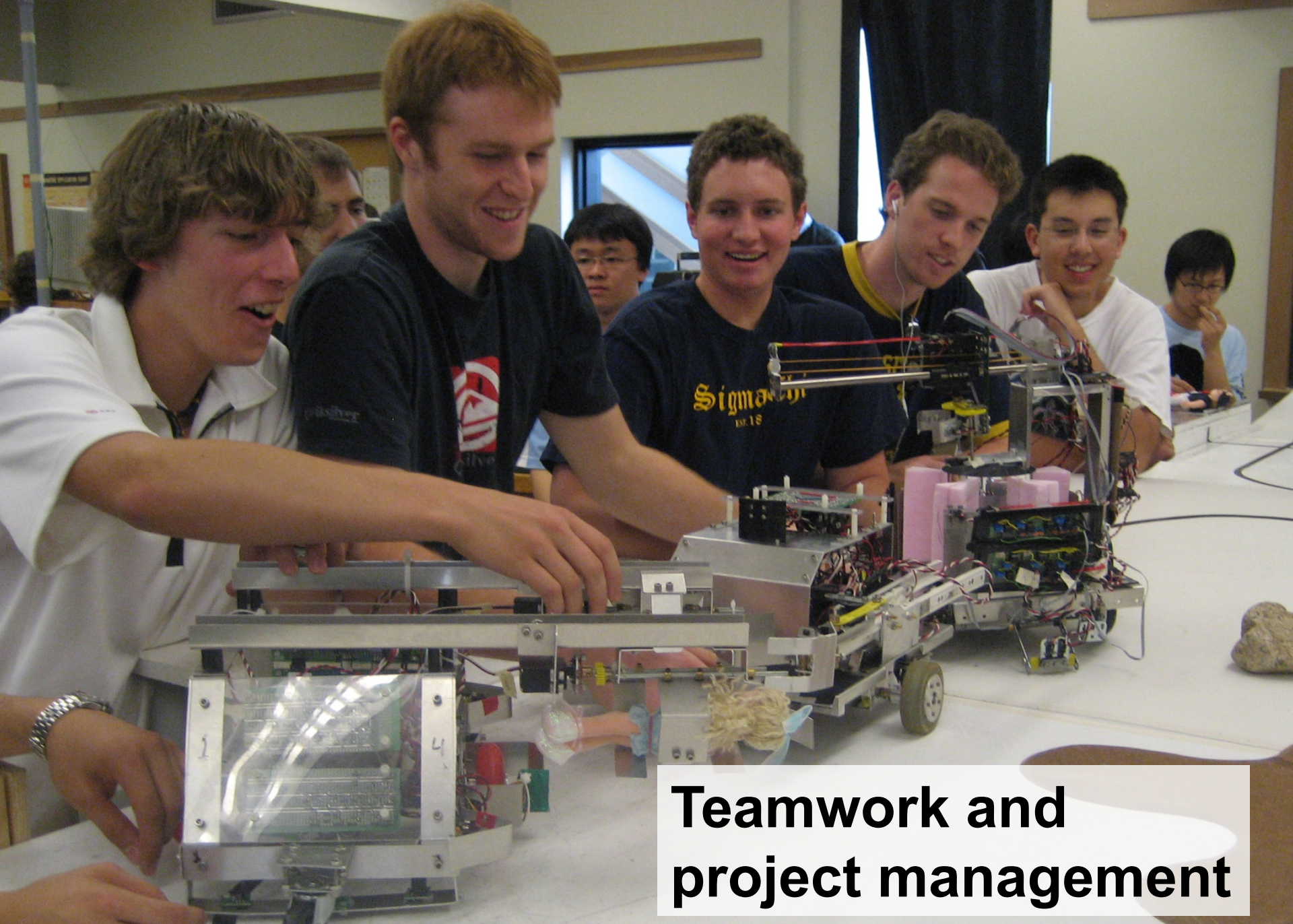
Based on Wiring
Board Environment
(www.wiring.org.co)

Similar development
to Arduino
(www.arduino.cc)



TINAH interface board

(Funding from Skylight, Teaching Learning Enhancement Fund)



**Teamwork and
project management**

We monitor team interactions (e.g. class survey).

6. For the next section of questions, please indicate your own (and your perception of your team members) competency in each of the following areas.

Use this as a scoring rubric:

Excellent (> 85)

Typical student in Phys 253 (middle 2/3 of class) (75-85)

Issues but OK (65-75)

Major Issues (< 65)

	Yourself	TeamMember1	TeamMember2	TeamMember3
Awareness of Personality Preferences - Recognize a variety of working and learning preferences; appreciate the value of diversity on a team	<input type="text" value="80"/>	<input type="text" value="80"/>	<input type="text" value="80"/>	<input type="text" value="80"/>
Team Communication - Communicate effectively with other team members	<input type="text" value="80"/>	<input type="text" value="80"/>	<input type="text" value="80"/>	<input type="text" value="80"/>
Responsibility - Assume responsibility for own work and participate equitably	<input type="text" value="80"/>	<input type="text" value="80"/>	<input type="text" value="80"/>	<input type="text" value="80"/>
Initiative - Exercise initiative and contribute to team goal-setting	<input type="text" value="80"/>	<input type="text" value="80"/>	<input type="text" value="80"/>	<input type="text" value="80"/>
Leadership - Demonstrate capacity for initiative and technical or team leadership while respecting others' roles	<input type="text" value="80"/>	<input type="text" value="80"/>	<input type="text" value="80"/>	<input type="text" value="80"/>
Professional Behaviour - Demonstrate punctuality, responsibility and appropriate communication etiquette	<input type="text" value="80"/>	<input type="text" value="80"/>	<input type="text" value="80"/>	<input type="text" value="80"/>
Meeting Participation - Participate actively in meetings, helps to generate ideas	<input type="text" value="80"/>	<input type="text" value="80"/>	<input type="text" value="80"/>	<input type="text" value="80"/>

FYI, your summer schedule is packed.
 (first 6 weeks of summer)

Time	Monday	Tuesday	Wednesday	Thursday	Friday
8:30	250-941	270-941	250-941	270-941	250-T91
9:00					
9:30					
10:00					270-T91
10:30	Math 257	257-941	Math 257	257-941	
11:00					
11:30		257-T91		257-T91	
12:00					253-941
12:30		Math 257		Math 257	communications
1:00	257-L01 /		257-L01 /		257-L01 /
1:30	253-L01		253-L01		253-L01
2:00		253-941		253-L01	
2:30					
3:00					
3:30					
4:00					
4:30					
5:00					
5:30					

253 schedule in July....

July									
9	1	2	3	4	5	6	7		
	CDay	Canada Day							
			start: RS	start: ML	start: YR	phys 250 midterm			
			close: YR, BZ	close JN	close: RS, AM	start: JN, BZ			
			2 - 8pm	12:30 - 8pm	2 - 8pm	close: JN, BZ			
						12:30 - 6pm			
10	8	9	10	11	12	13	14		
			9am-noon						
		start: JN	start: RS	start: ML, BZ	start: YR	start: JN, BZ			
		close ML	close: YR, BZ	close JN	close: RS, AM	close: JN, BZ			
		12:30 - 8 pm	9-noon, 2-8pm	12:30 - 8 pm	9-noon, 2-8pm	12:30 - 6 pm			
11	15	16	17	18	19	20	21		
			closed in morning						
			due to phys250 review			Class meeting	phys 250 final		
						2:30pm. Everyone			
						please attend.			
		start: JN	start: RS	start: ML, BZ	start: YR	start: JN, BZ			
		close ML	close: YR, BZ	close JN	close: RS, AM	close: JN, BZ			
		9am - 11 pm	2pm - 11pm	9am - 11pm	9-noon, 2 - ??pm	12:30 - 6 pm			
12	22	23	24	25	26	27	28		
			Time						
		start: JN, RS	Trials	start: ML, BZ	math 307 final				
		close ML, YR		close JN	2pm: YR	9am: YR			
		9am - 11pm	Lab Closed	9am - 11pm	close: RS, AM	close: JN, BZ			
					2pm- 11pm	9am-9pm			

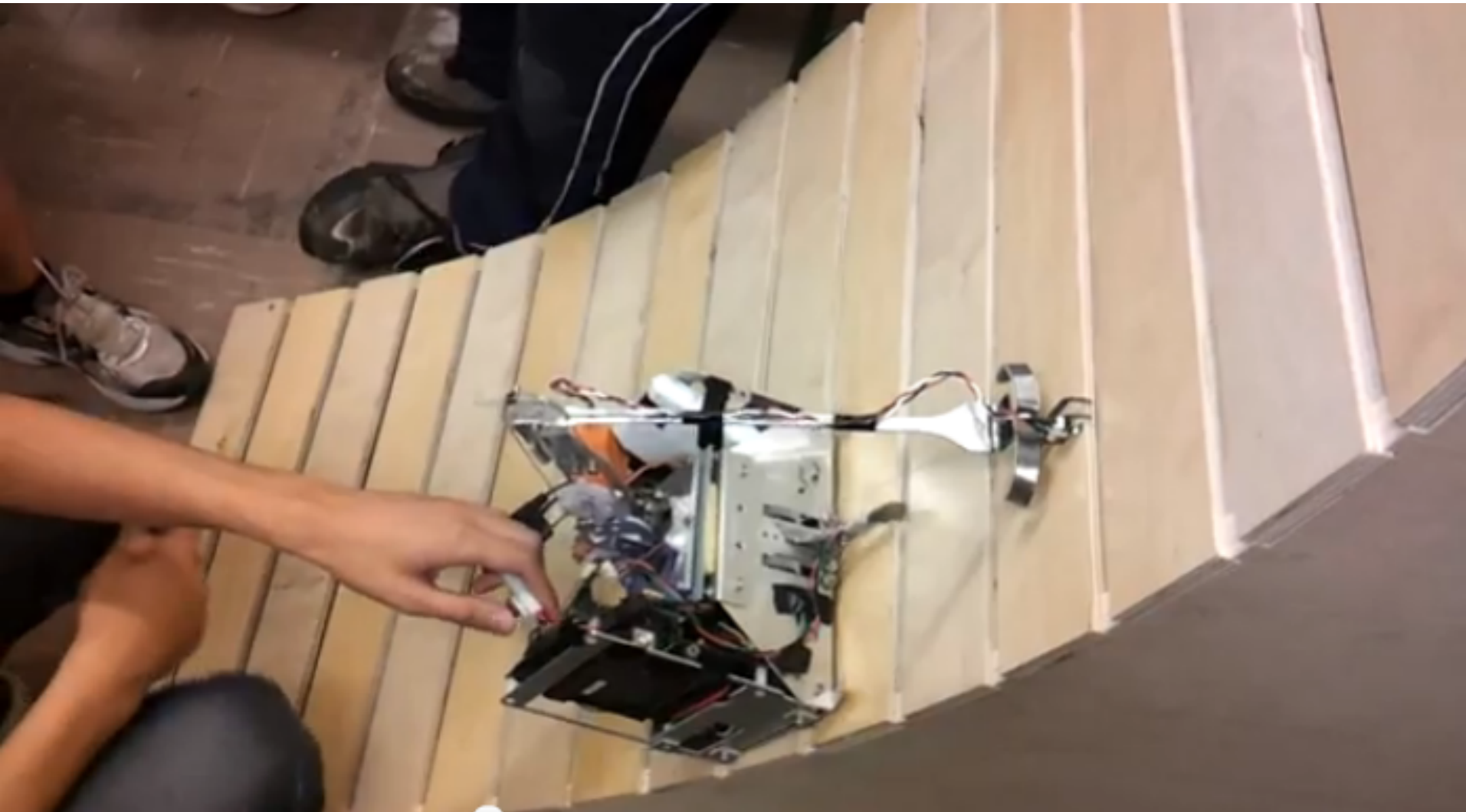
Other details:

- 13-week summer term (May 14 – Aug 10th).
 - 6 weeks labs and training, 6 weeks build time.
 - Groups of 4 students (very rarely 3 or 5)
- Continuation of Technical Communication started in ENPH 259.

- Ties to other courses:
 - PHYS 257 (thermodynamics) – solidworks used to generate thermal models
 - PHYS 270 – possible interactions with Mechanics II

Previous Competitions

Summer 2011 – Climber-Bots

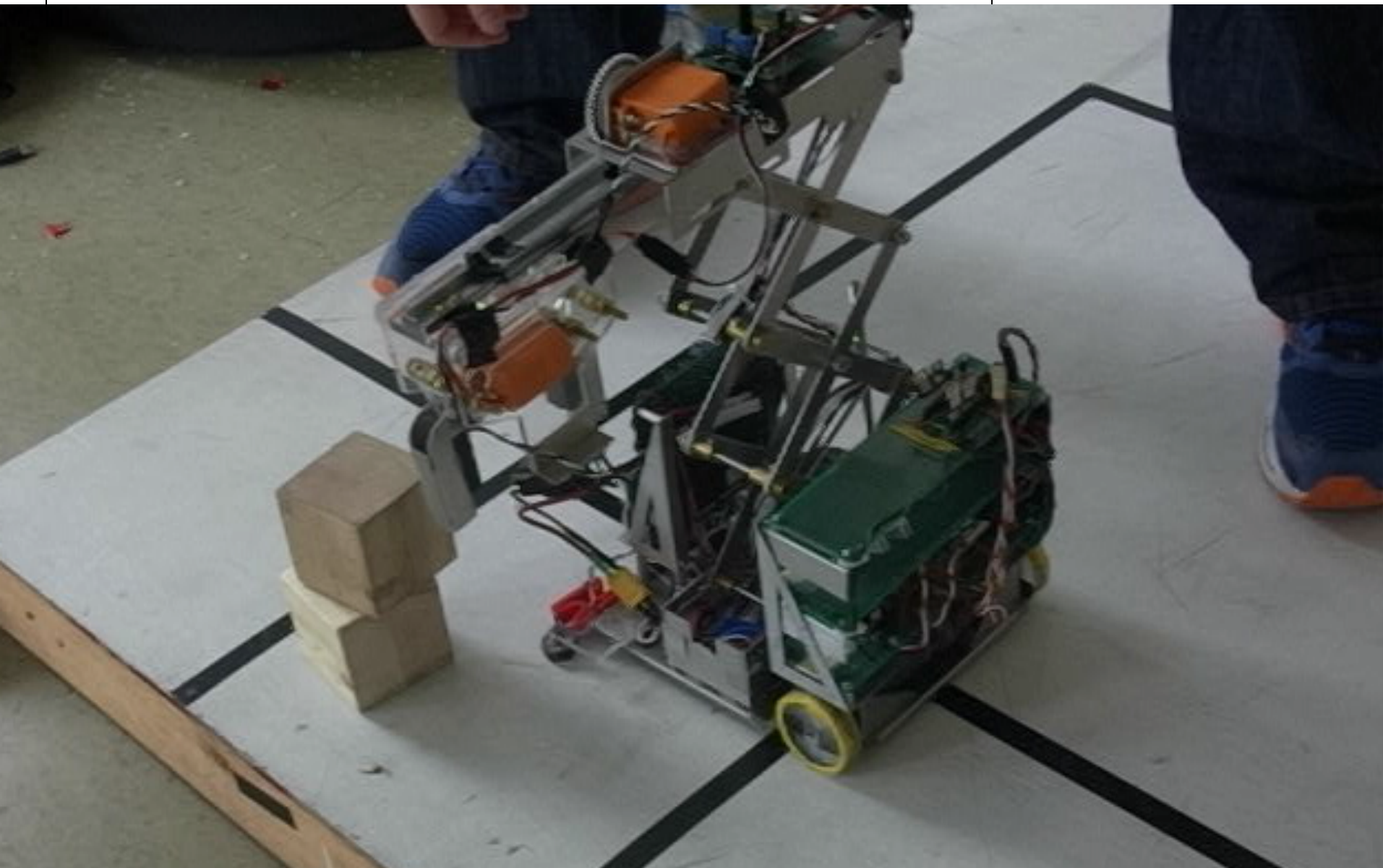


1:00 / 3:05

CC 360p



Summer 2012 – Build-Bots



Summer 2013 – Whac-A-Mole



Summer 2014 – Indiana Robot!



3.

Ways to get
ready for next
summer

1. Plan your summer accordingly (additional courses, jobs, commitments, etc)
2. Check out ENPH 253 website, and last year's course website
3. Solidworks SEK should be available through UBC Connect
4. Contact PHAS Machine Shop for 10-module course
5. Review material from ENPH 259 before start of summer

End.