

prototyping

BAEN 541

1. Why Prototype? + examples
2. Tools on campus
3. Part 1 – electronics + physical prototyping
4. Part 2 – practice thinking about prototypes

Jon Nakane, Bernhard Zender
UBC Engineering Physics Project Lab
BAEN 541 – 2015 Nov

1.

Why do you need
a Prototype?

Function Form

Successful prototyping is prototyping for a specific purpose

1. What do you want to do with this prototype?
2. Who will see and use it?
What is the most useful outcome from them using the prototype?



iPod, early stealth prototype (2001)
On loan from the Wellcome collection



4inch

10inch
(estimate)

<http://www.boreme.com/posting.php?id=21374>



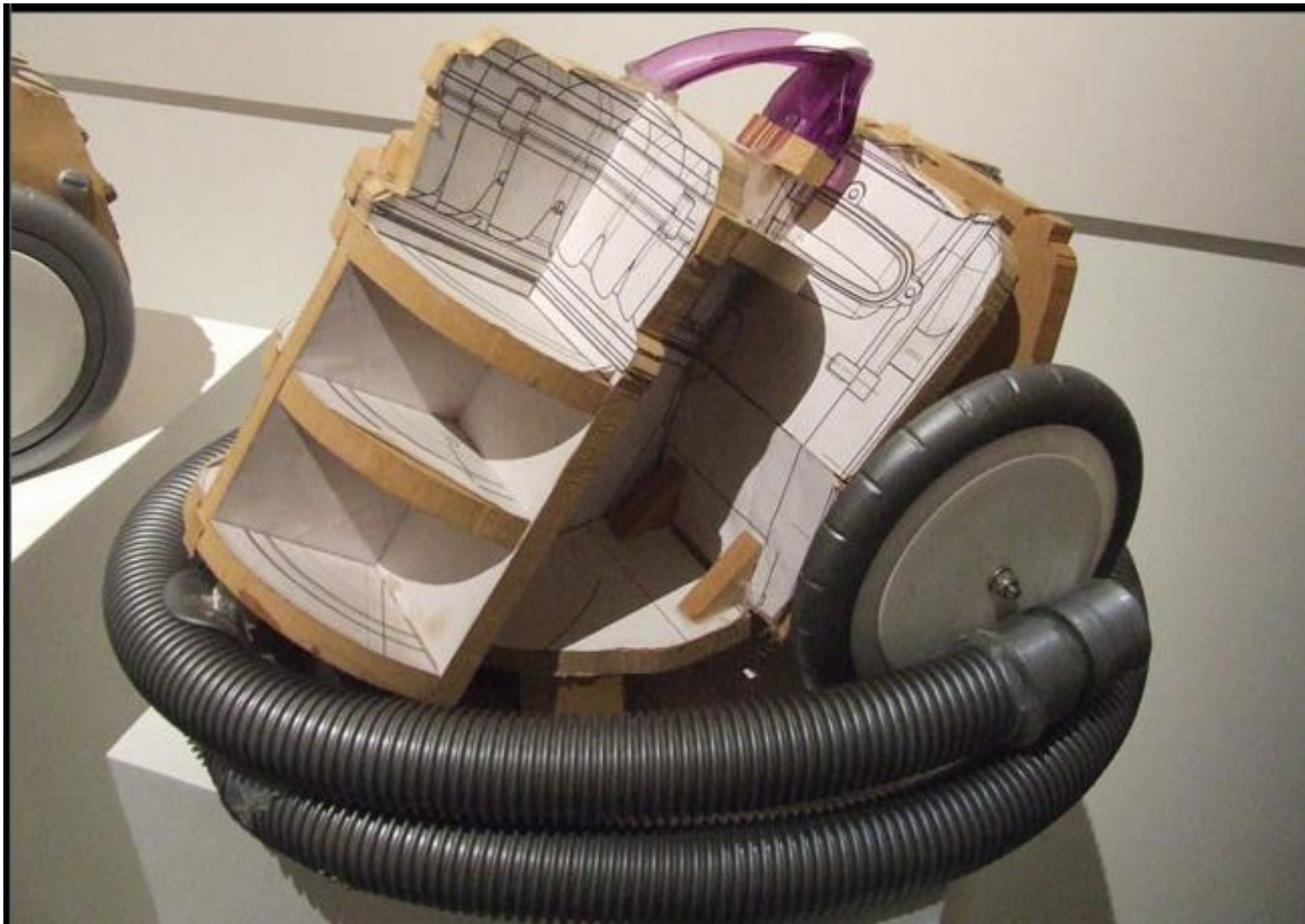




<http://arstechnica.com/apple/2013/03/exclusive-super-early-iphone-prototype-had-5x7-screen-serial-port/#image-3>







<http://www.core77.com/gallery/vienna-design-week-2010/26.asp>



Prototyping



<http://gizmodo.com/here-are-what-the-prototypes-of-google-glass-looked-lik-507193147>

Kinetic Art Project Competition for the UBC Student Union Building





Kinetic Art Competition – TIMBER!

2.

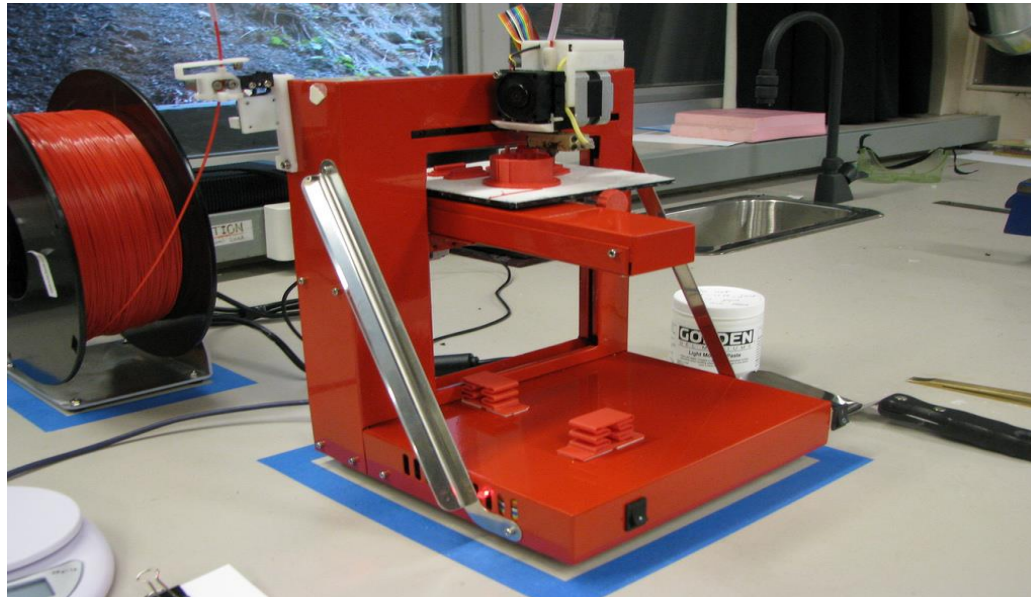
Tools on Campus



WaterJet cutter

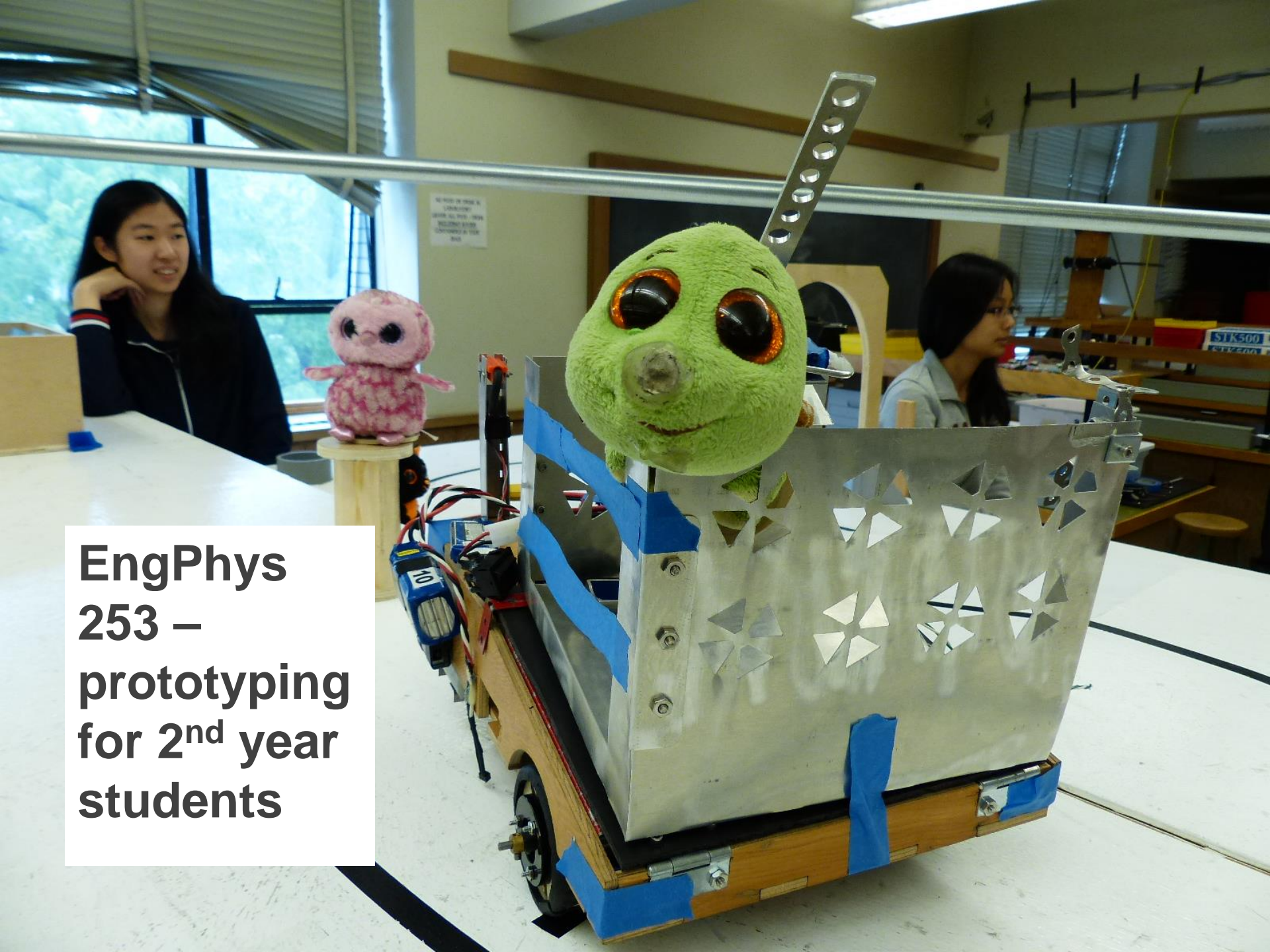
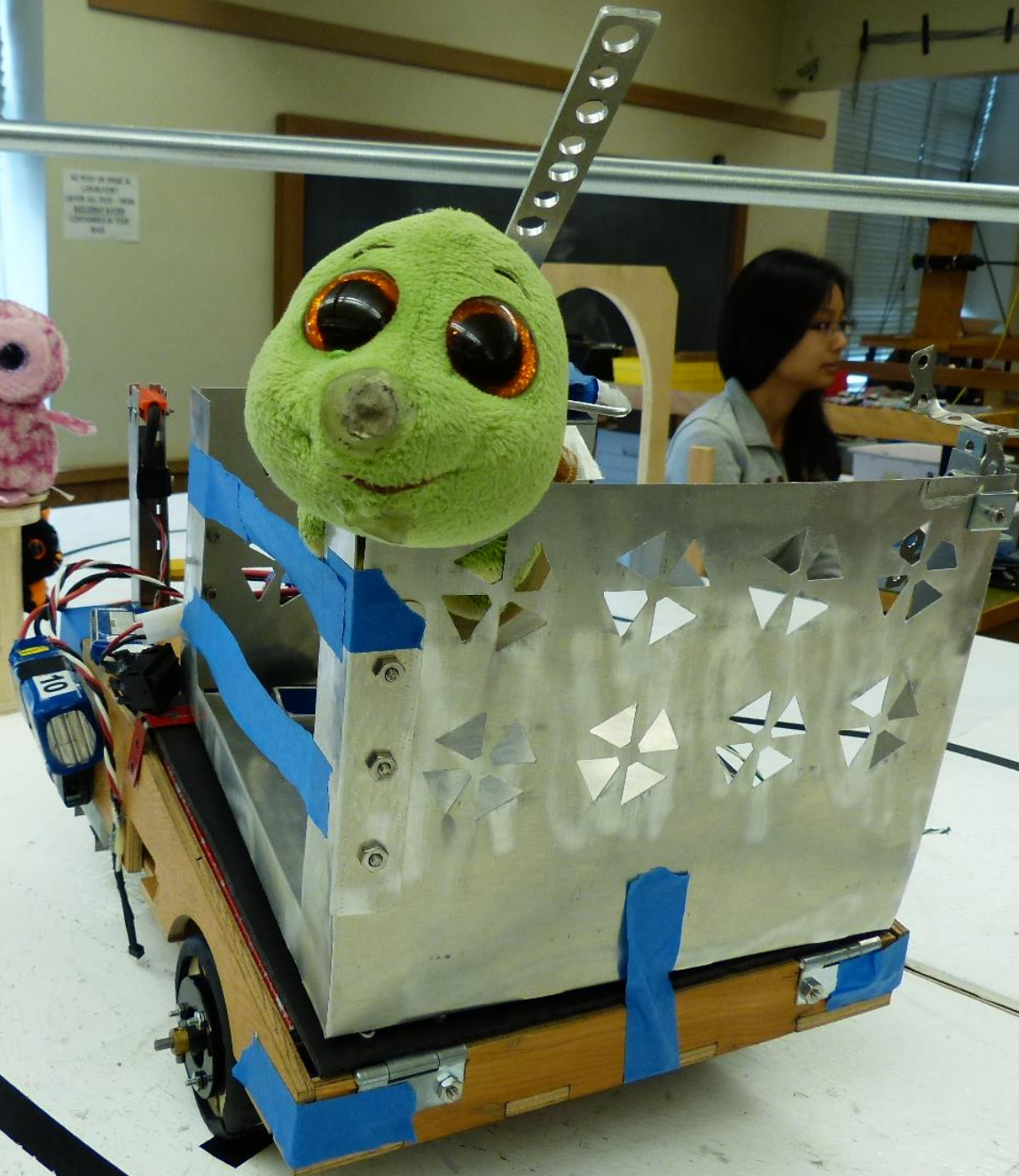


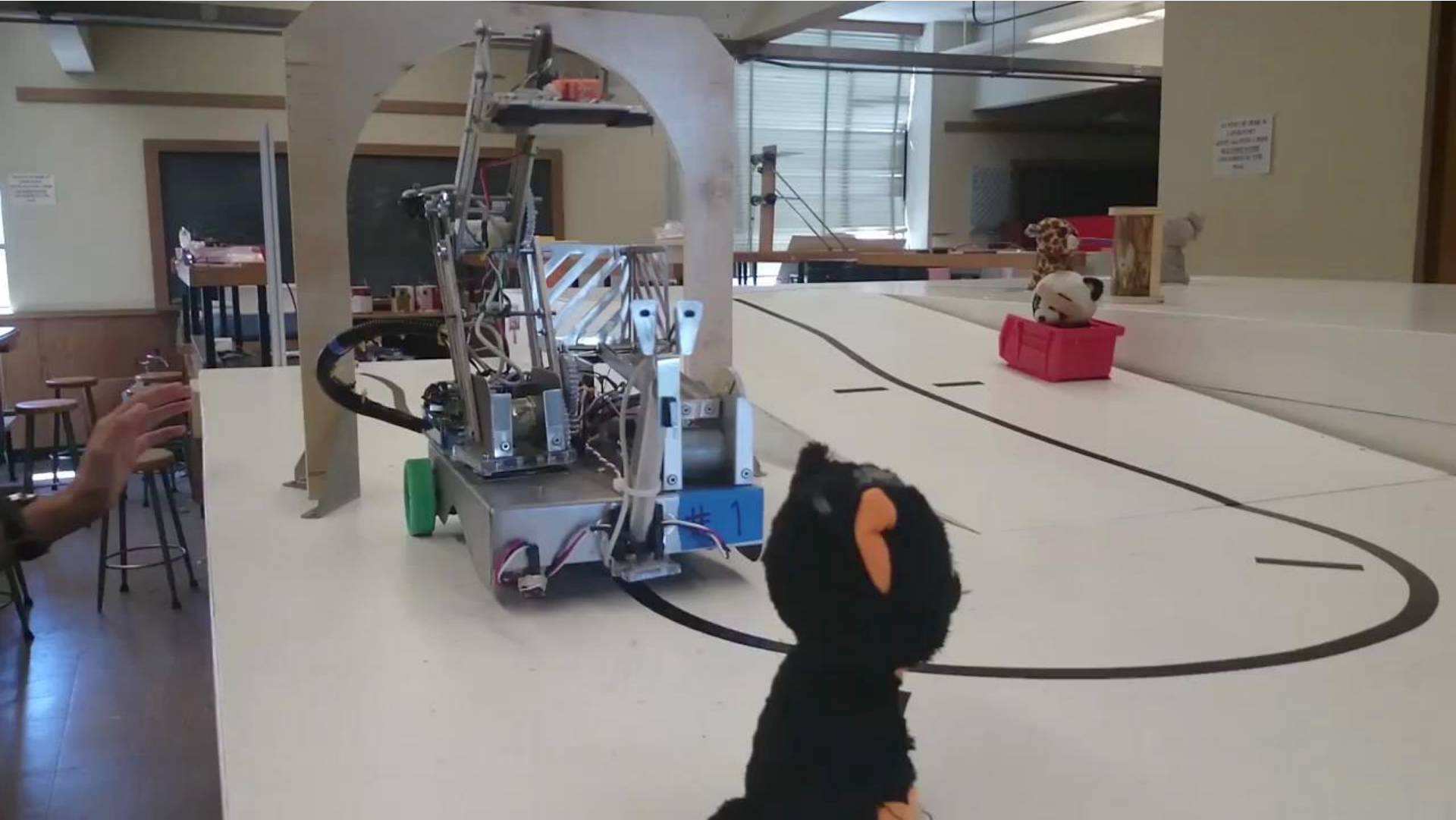
Laser Cutter/Engraver



3D Printer

**EngPhys
253 –
prototyping
for 2nd year
students**



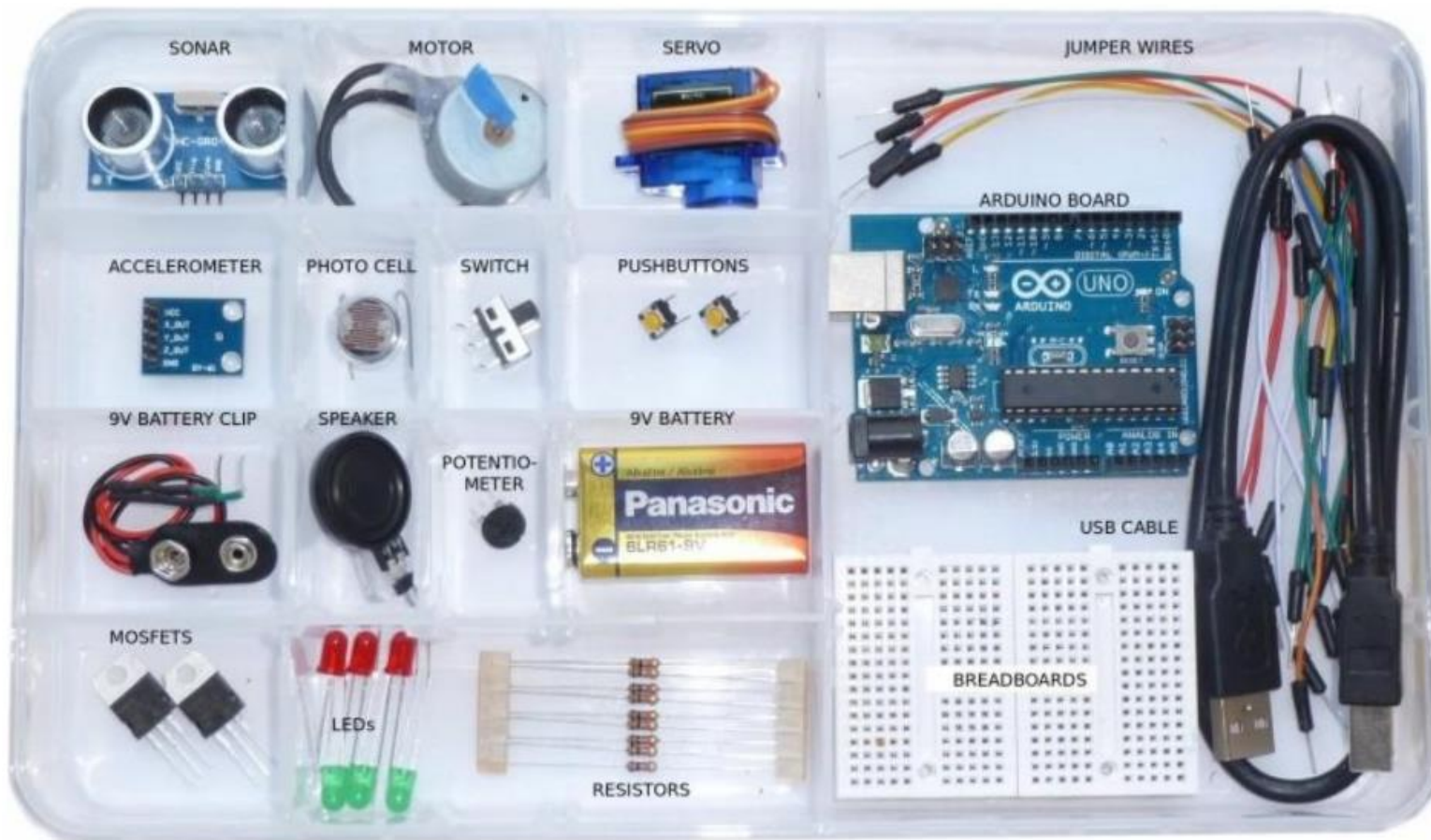


3.

Part 1

Electronics +

Physical Prototype



Your kit contains:

1x Arduino Uno
 1x USB cable
 9x resistors
 1x knob (potentiometer)
 2x small breadboards
 2x MOSFET transistors

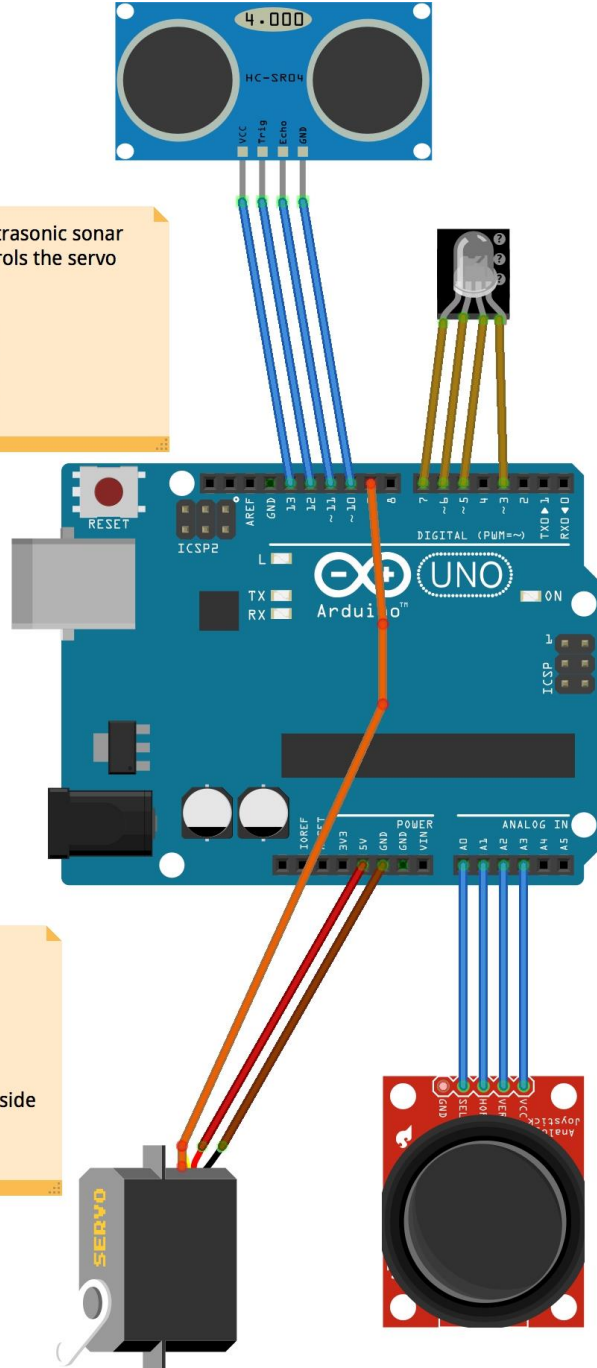
1x 9V battery
 1x 9V battery clip
 1x small servo motor
 1x small DC motor (with blue flag)
 6x LEDs, assorted colours & sizes
 1x photocell

1x sonar
 1x accelerometer
 1x switch
 2x pushbuttons
 A set of jumper wires

If items are missing, we do have some spares at the front.

Kits available from the UBC Library (3-day loan) ~\$50 parts

Today's Electronics Activity



HC-SR04 (ultrasonic sonar sensor, controls the servo motor)

VCC Pin 13
 Trig Pin 12
 Echo Pin 11
 Gnd Pin 10

RGB LED

'L' Pin 7
 R Pin 6
 G Pin 5
 B Pin 3

Note: Skip over Pin 4, not used for this demonstration.

Servo Motor

Orange Pin 9
 Red Pin 5
 Brown Pin GND (either one is OK)

Note: The orange wire connects to the far side of the Arduino board.

Joystick (controls the RGB LED)

GND Pin A3
 +5V Pin A2
 VRx Pin A1
 VRy Pin A0
 SW not connected to anything

Note: labels on this drawing are incorrect, refer to the labels in the list above, and physically on the Joystick itself!

Physical Prototype

4.

Part 2

Practice thinking
about prototypes

Practice thinking about prototypes for two o

What kind of problems can I solve with t

vs.

What technology can I use to solve this

Jon Nakane

jnakane@physics.ubc.ca

Bernhard Zender

bzender@phas.ubc.ca

Thanks!