Sens-O-Rama

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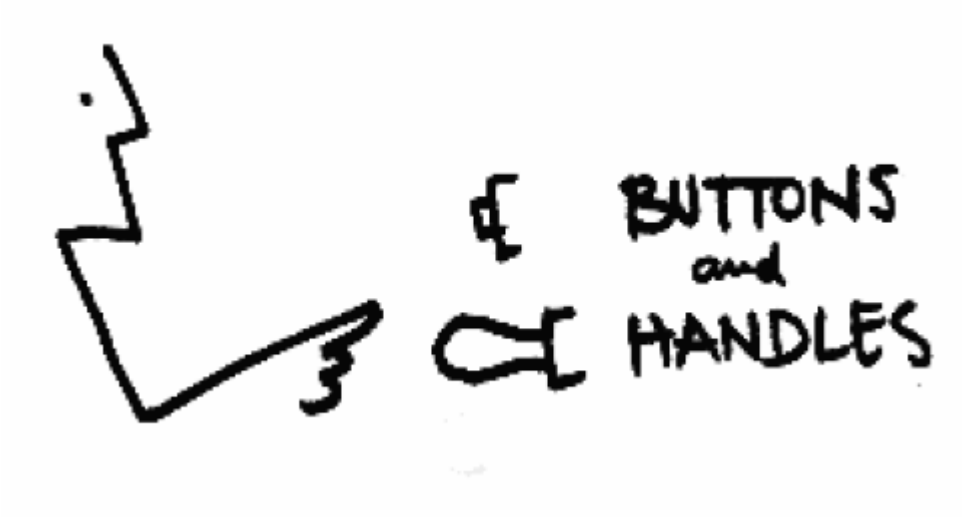
http://hci.stanford.edu

Thinking about sensors...

- What real-world phenomenon is the sensor measuring by itself?
- How is it coupled to the world?
- What is the type of output data?
  - Discrete: Binary (1|0) or Categorical
  - Continuous

} **How many dimensions of data?**

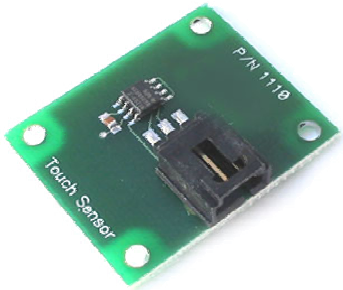
- What is the output protocol?
  (i.e., how do I read this thing?)


BUTTONS
and
HANDLES

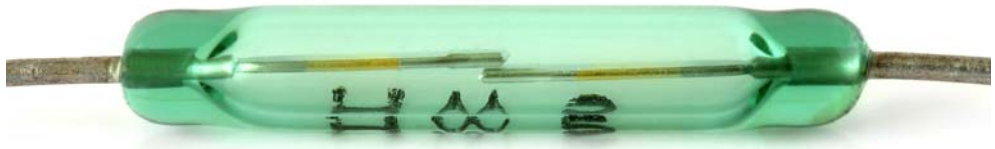
Switches

Mechanical Tilt Switch

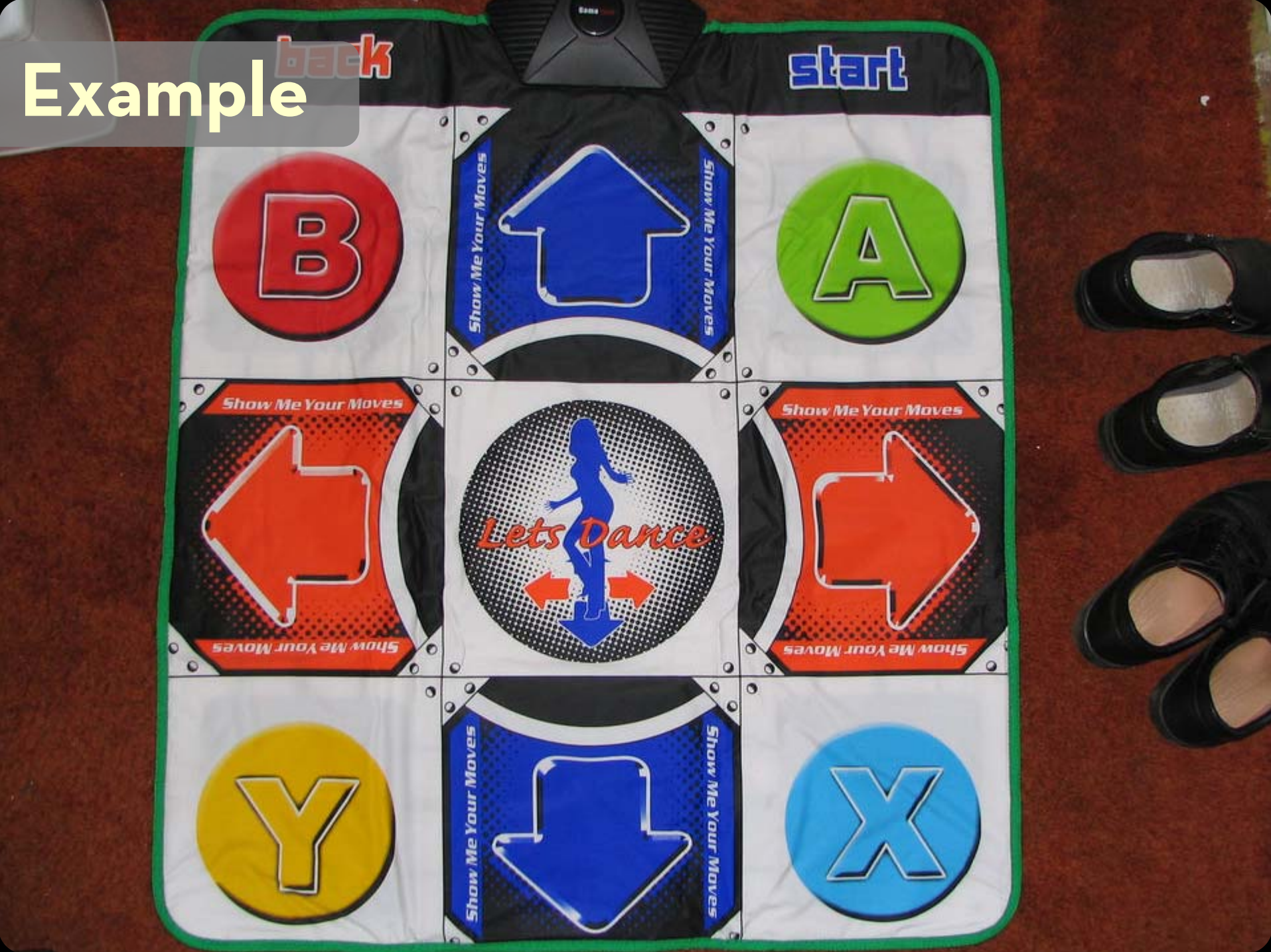
Standard Switches: tactile, rocker, spring, slide, key



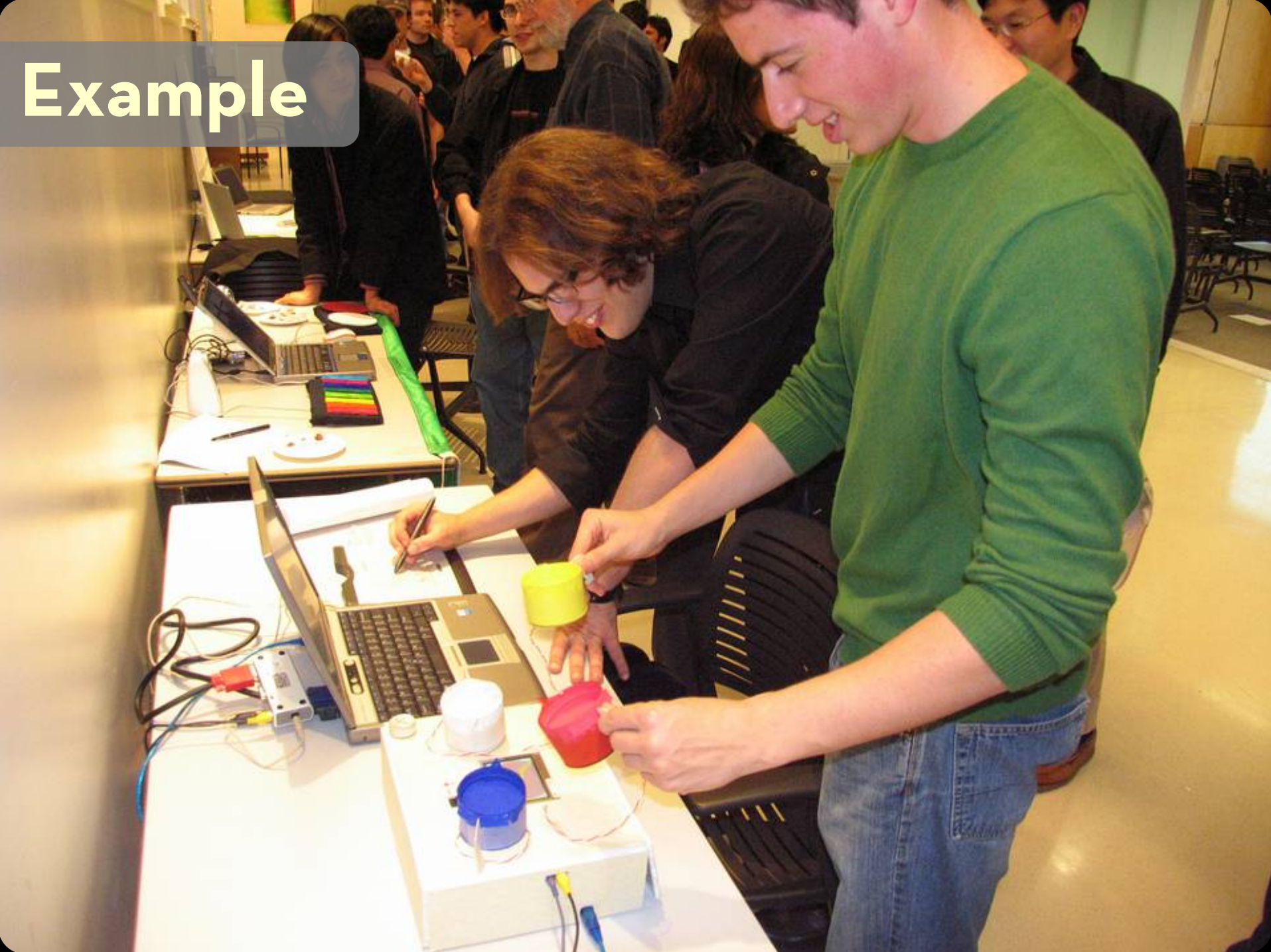
Capacitive Touch Sensor



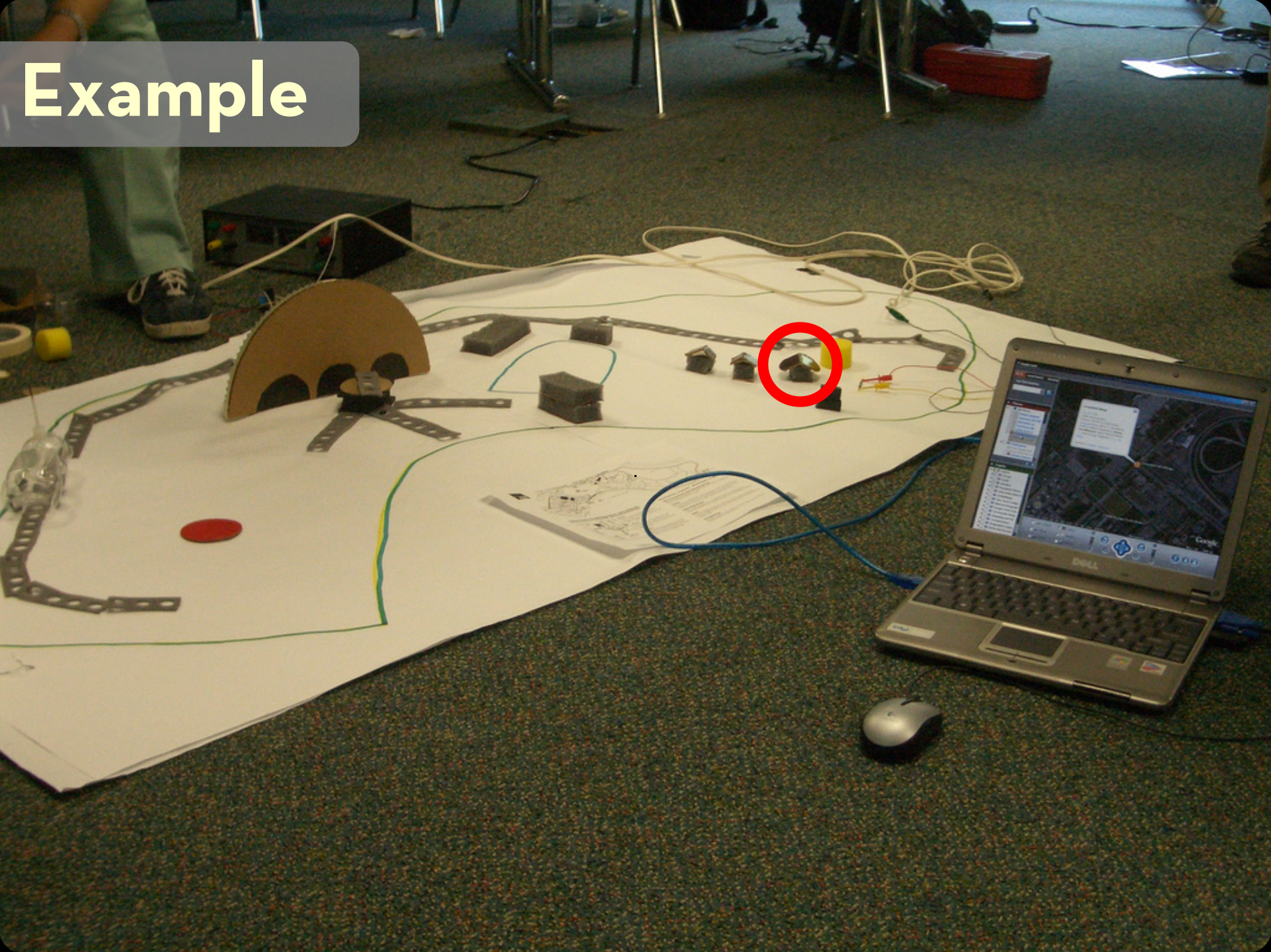
Reed Switch


Example
back
start
B
A
Y
X
Show Me Your Moves
Lets Dance

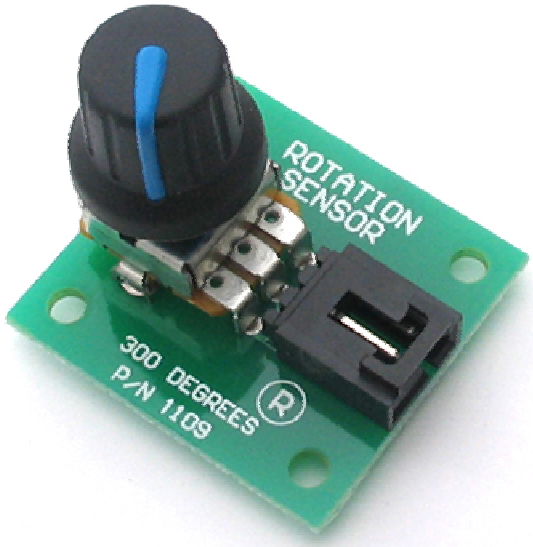
Example

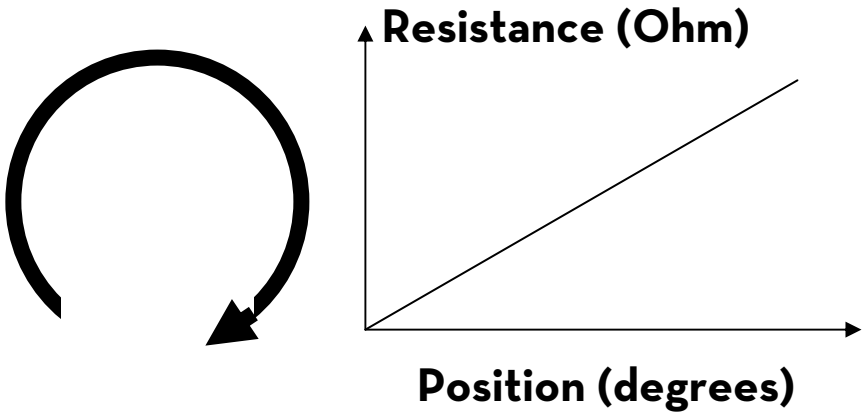


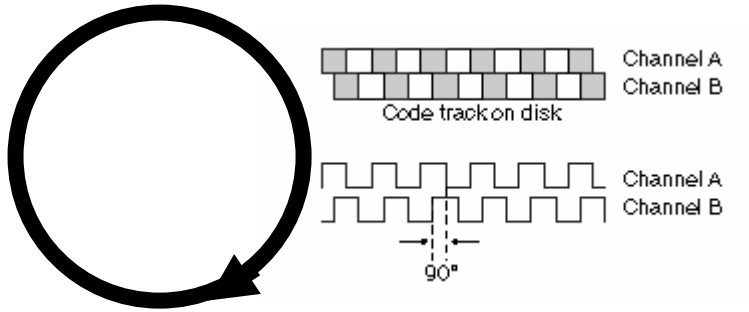
Example



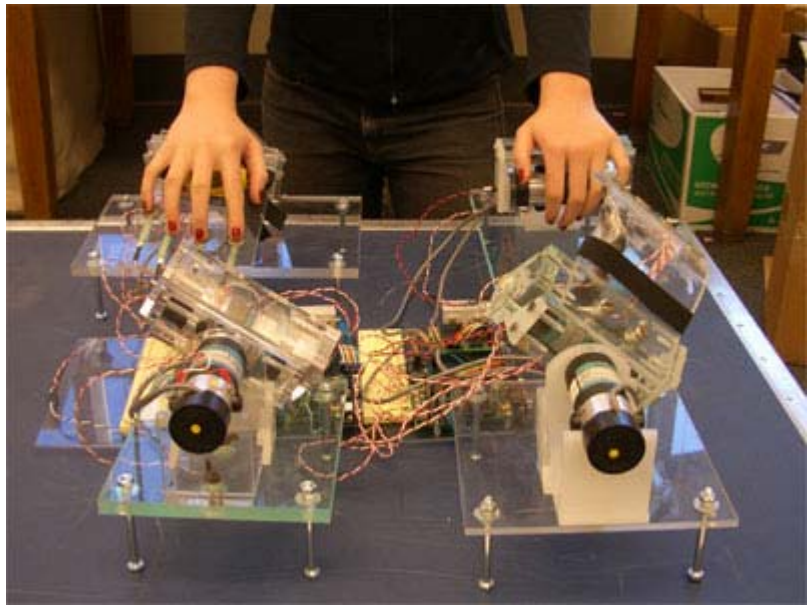
Rotation: Pots & Encoders

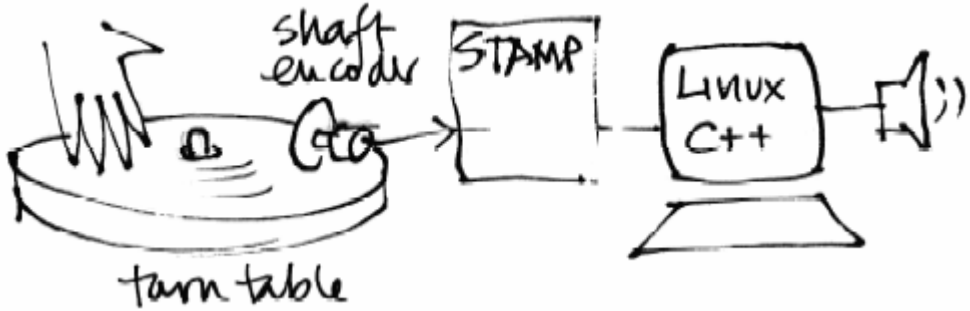


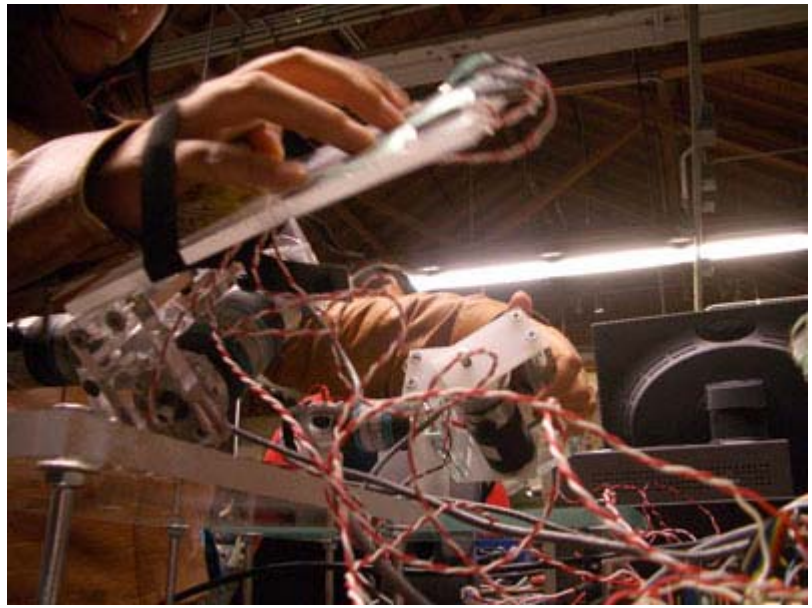




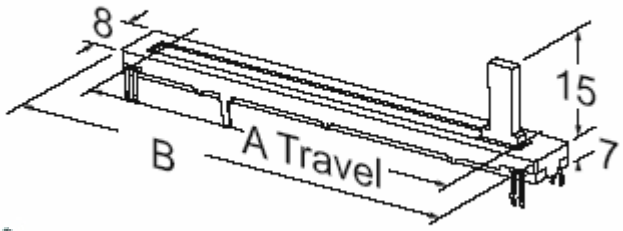
Examples

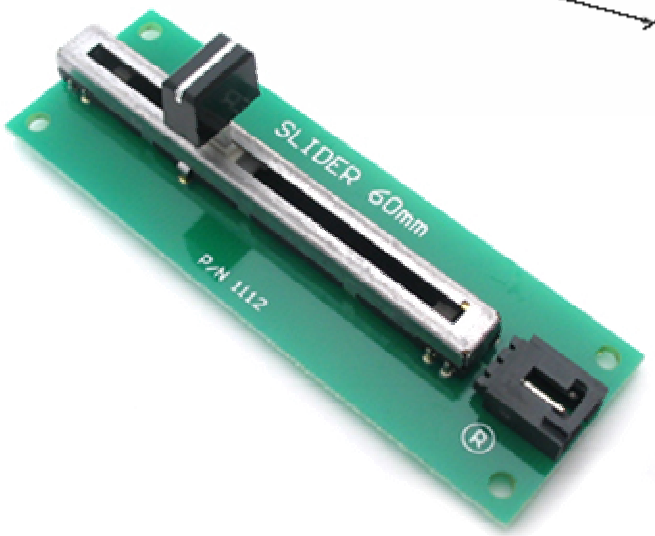




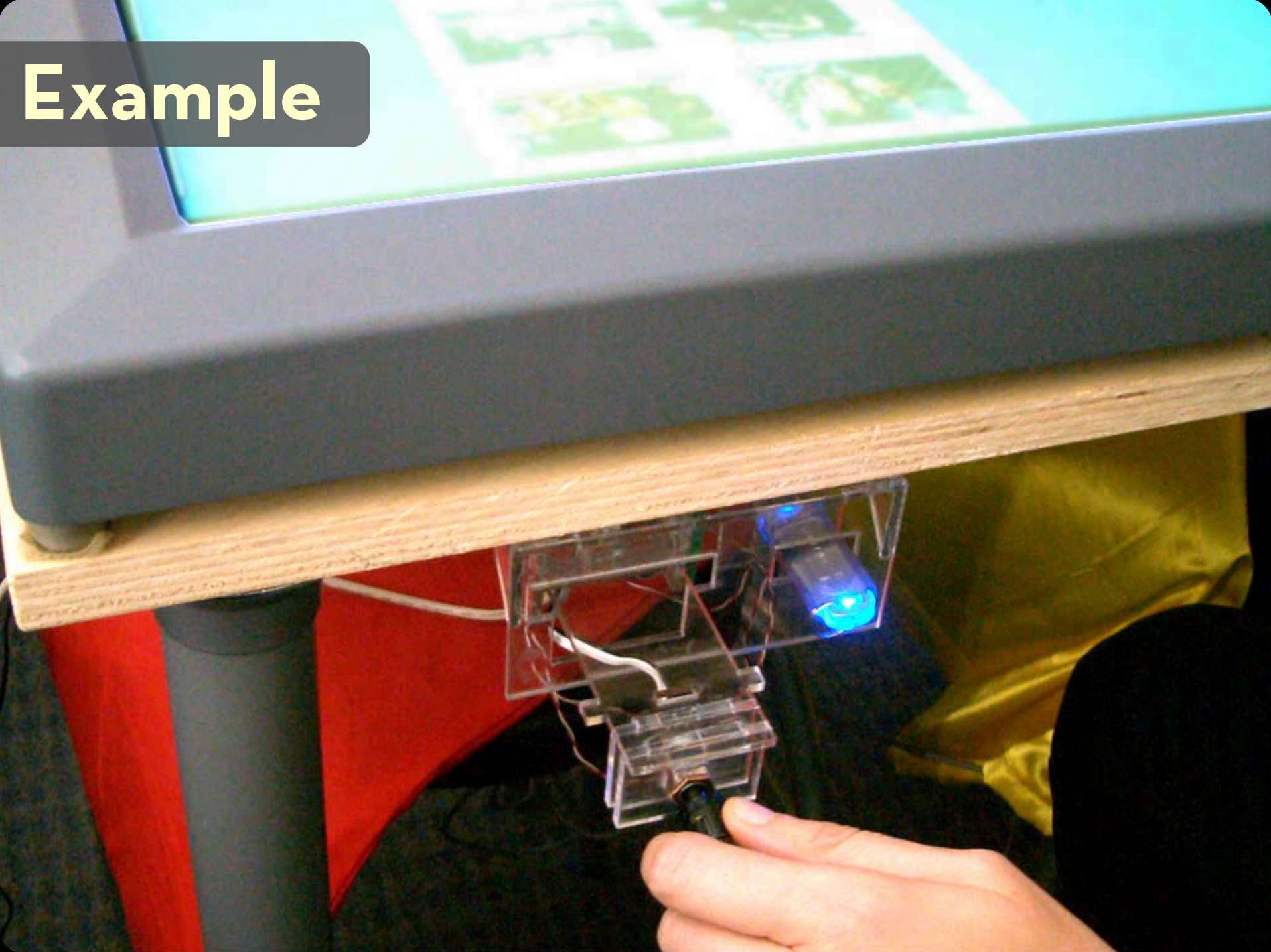


Sliders: Linear Pots

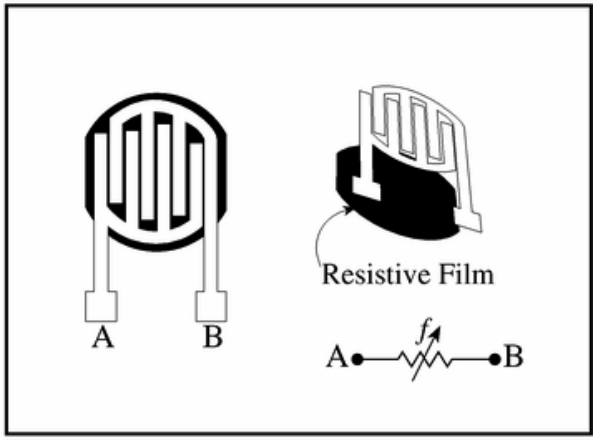


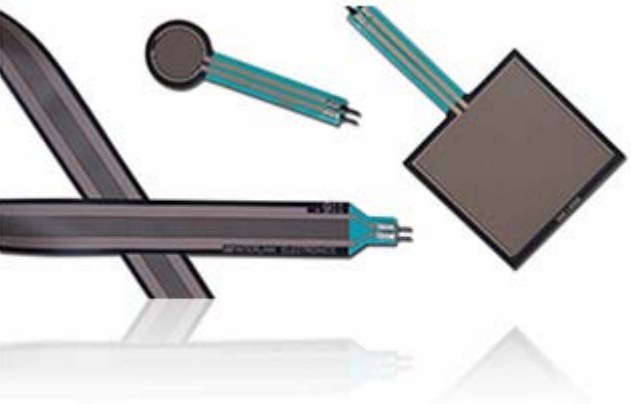


Example

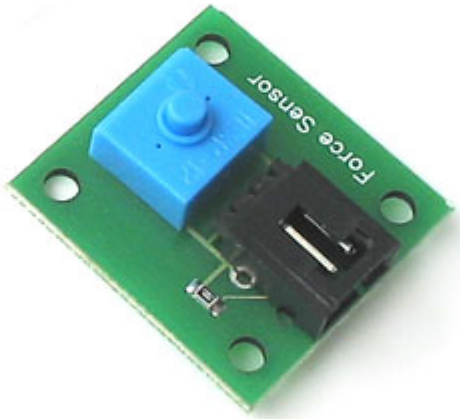


Pressure/Weight



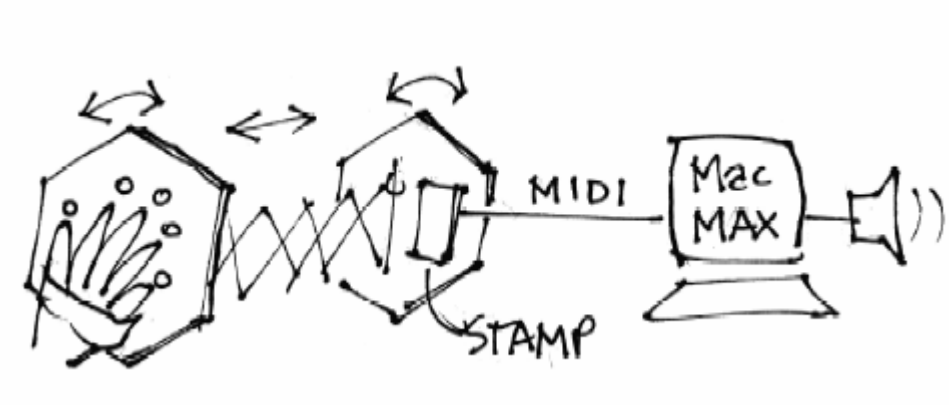


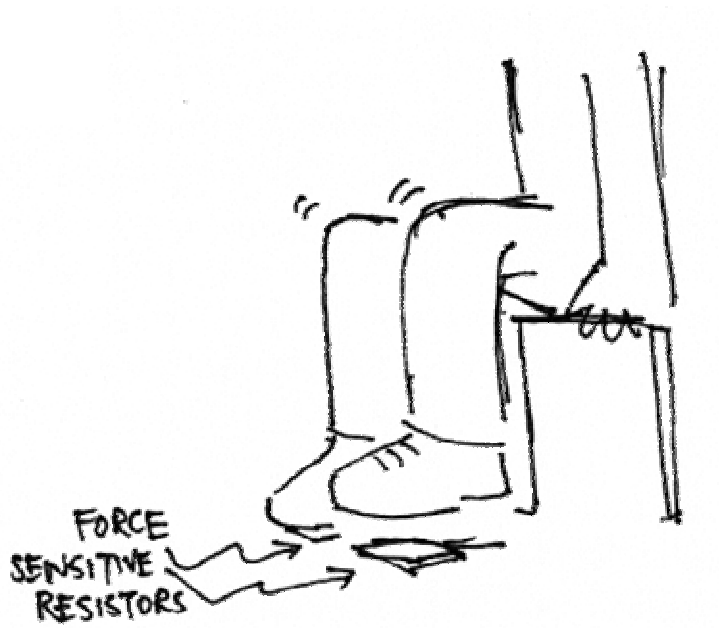
Force Sensitive Resistors (FSR)



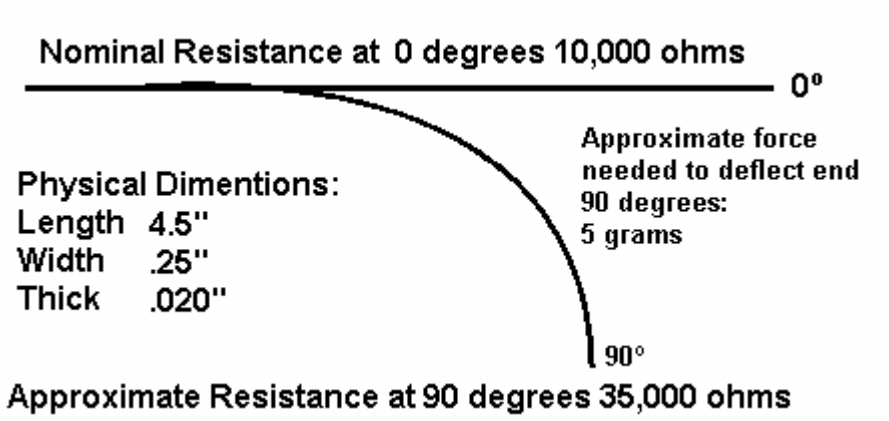
Load Cell

Examples



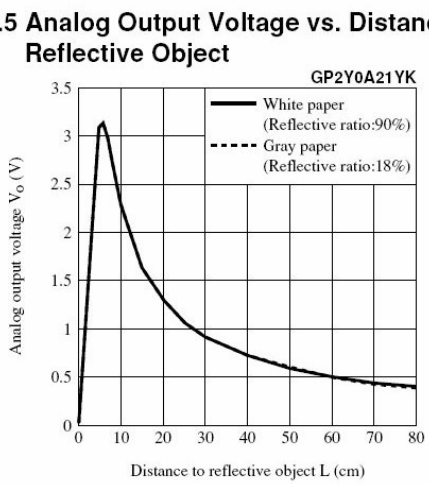


Bend Sensors

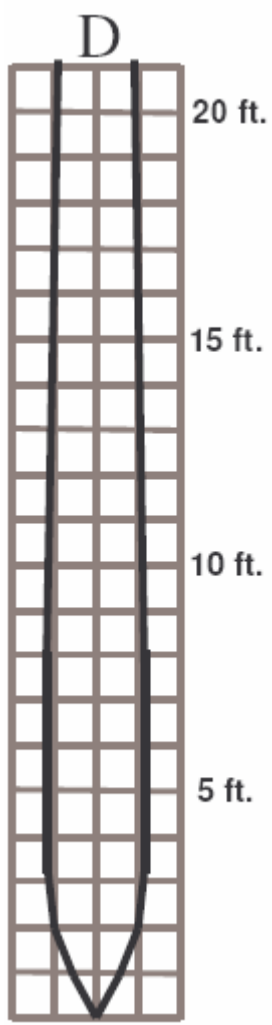


Distance: IR + Ultrasonic

Sharp IR Ranger (10-80 cm): $10

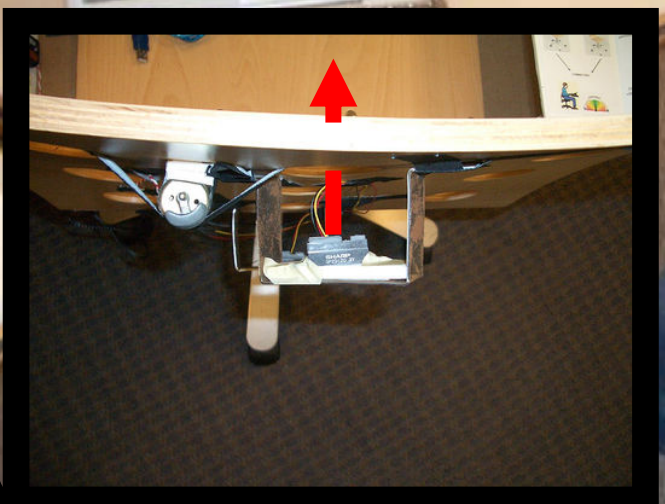


Maxbotix Ultrasonic range finger
$20 (0 - 645 cm)



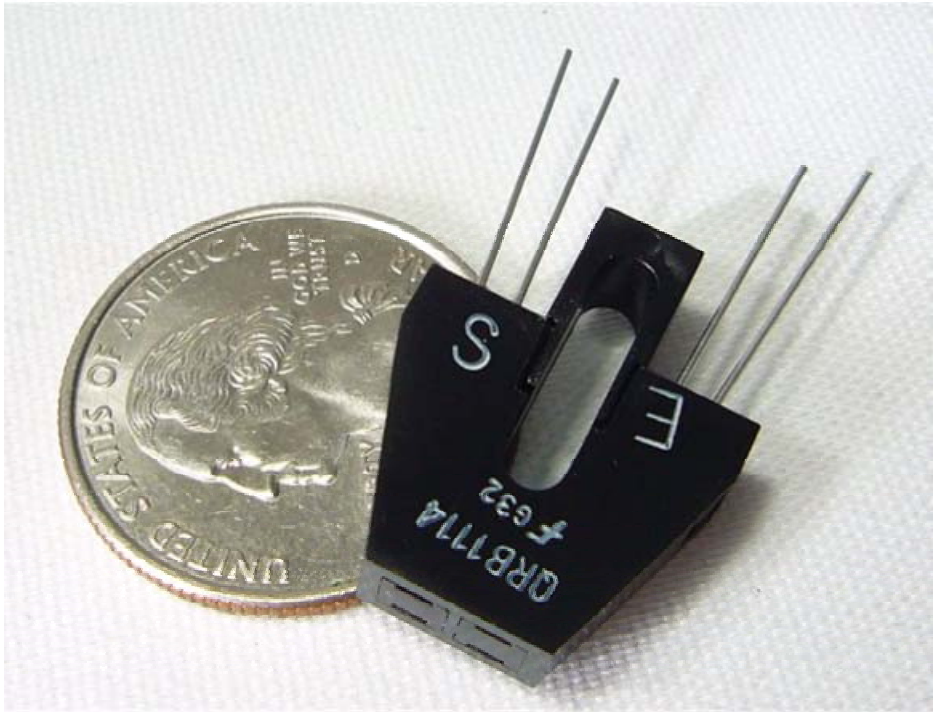
PING))) Ultrasonic Sensor (2-300cm)

Example



Light: Intensity

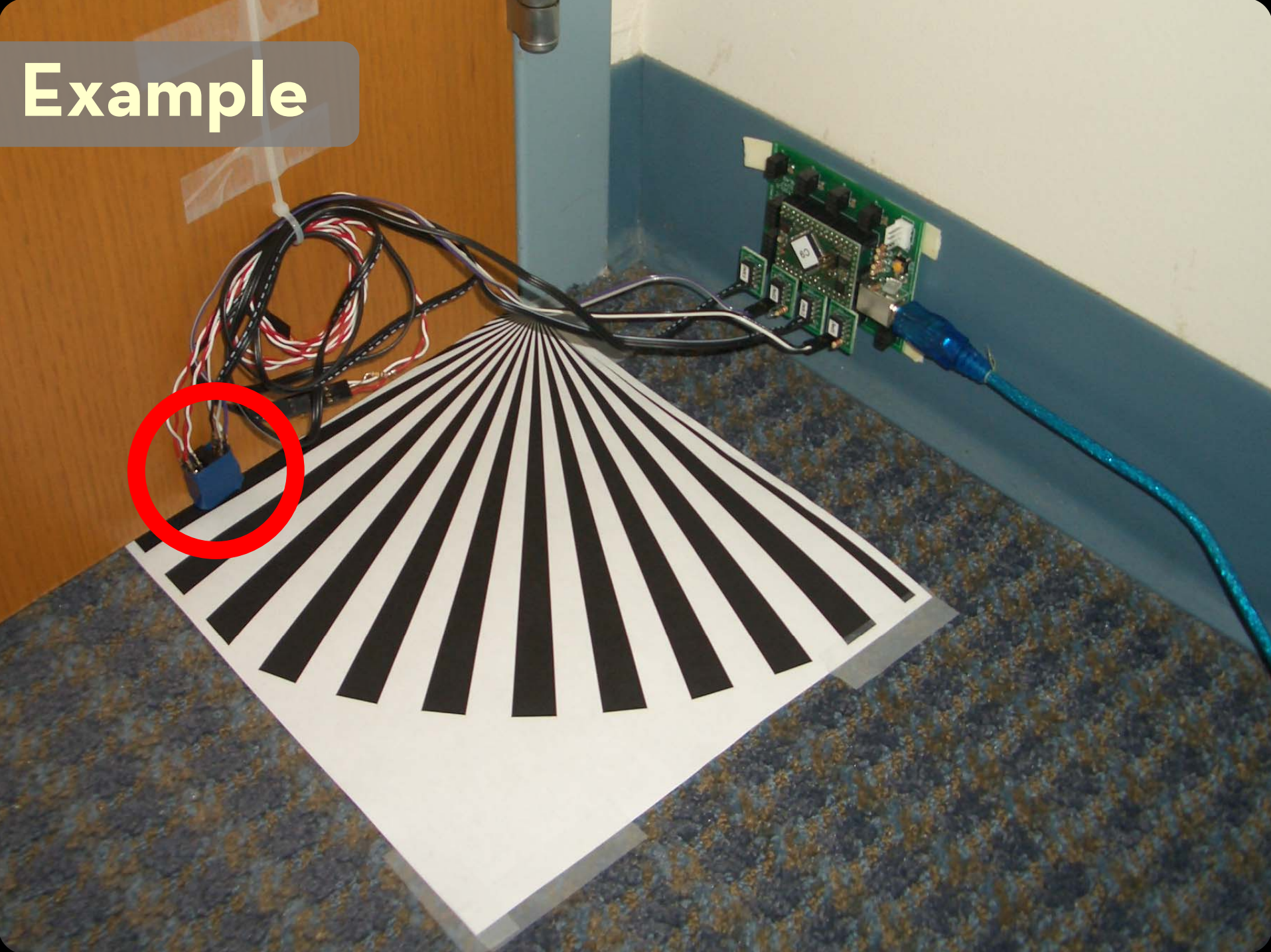
IR emitter + IR photo transistor



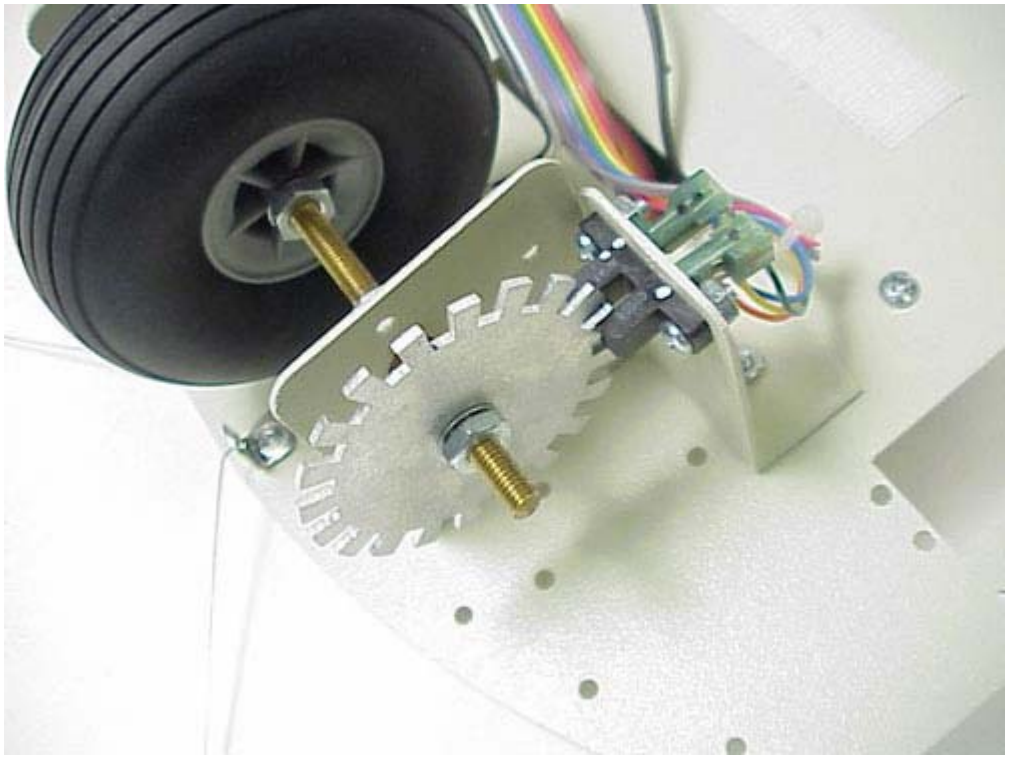
$1

$6

Example

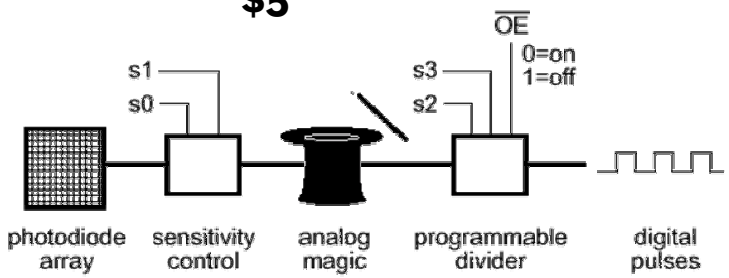


Light: Slot sensor



Light: Wavelength/Color

$5

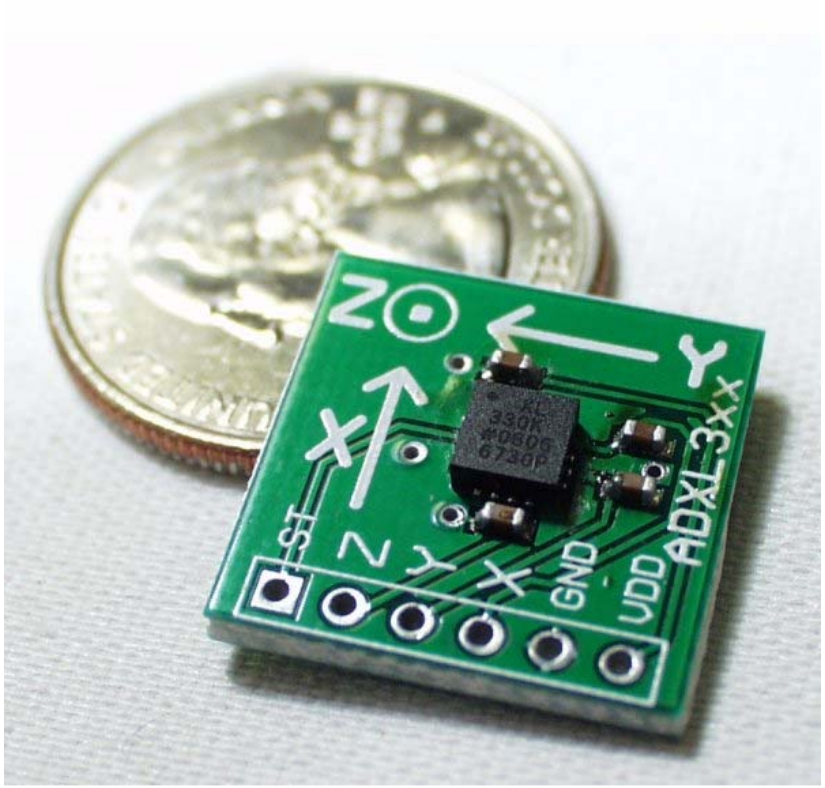


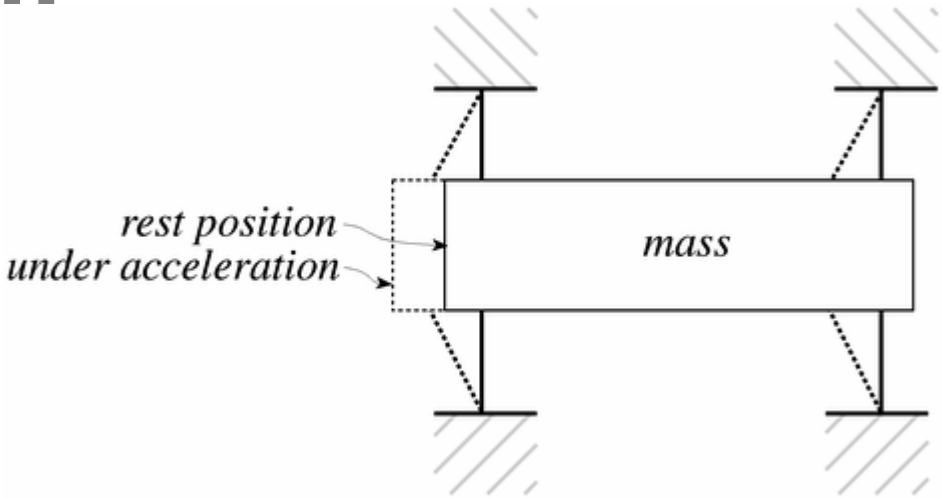
$80

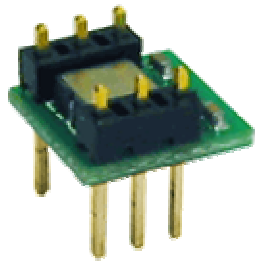
Example

RGBy_movie

Tilt+Acceleration



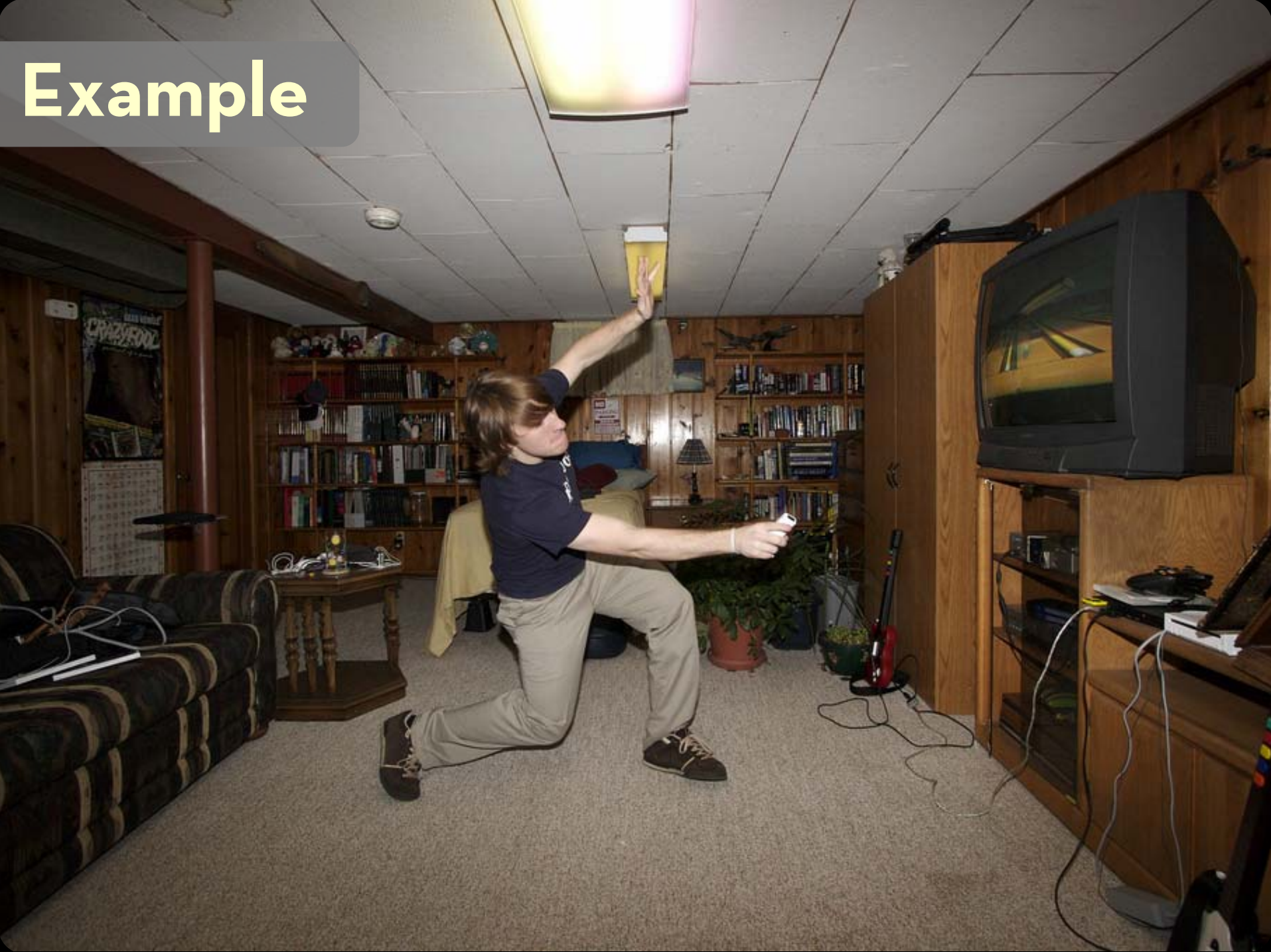




ADXL330 Tri-axis acceletrometer from Sparkfun
$30 ($10 for sensor w/o board)

Memsic from Parallax - $30

Example

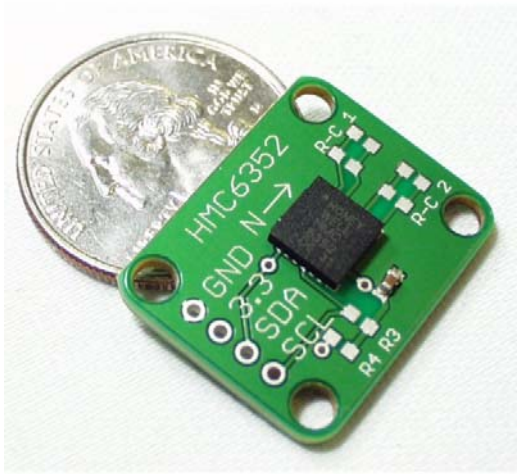


Example

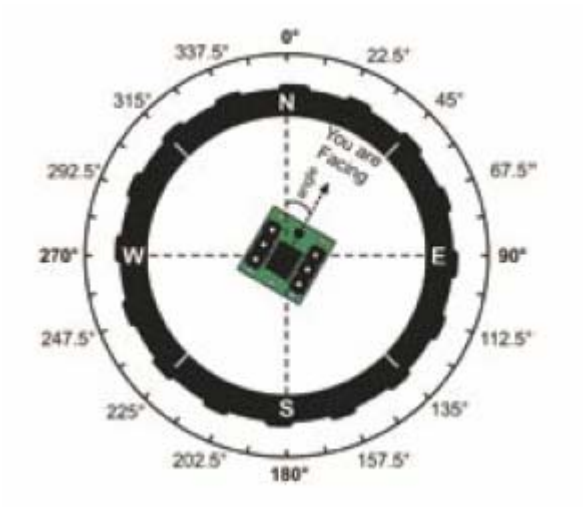
Nintendo Wii

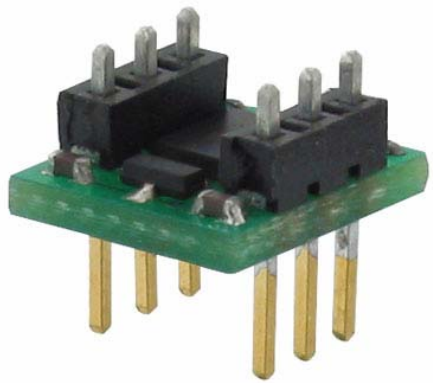
Headmouse

Magnetic Field: Dig. Compass



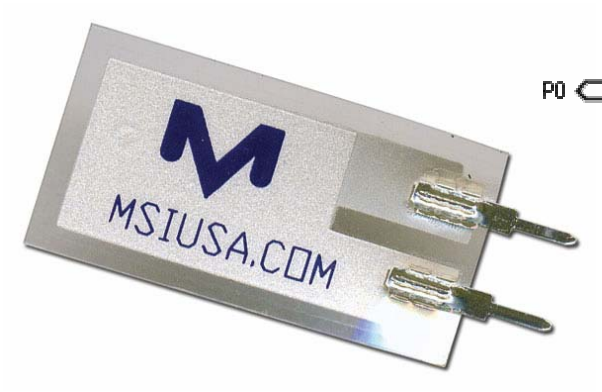
$60 Sparkfun (I2C interface)

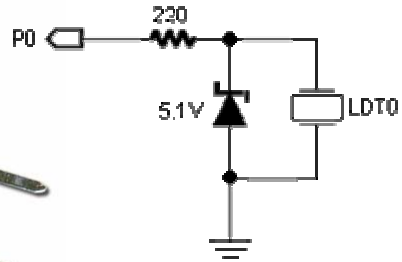




$30 Hitachi/Parallax

Vibration: Piezo





$1.70

$9

LeapFrog Learning Drum

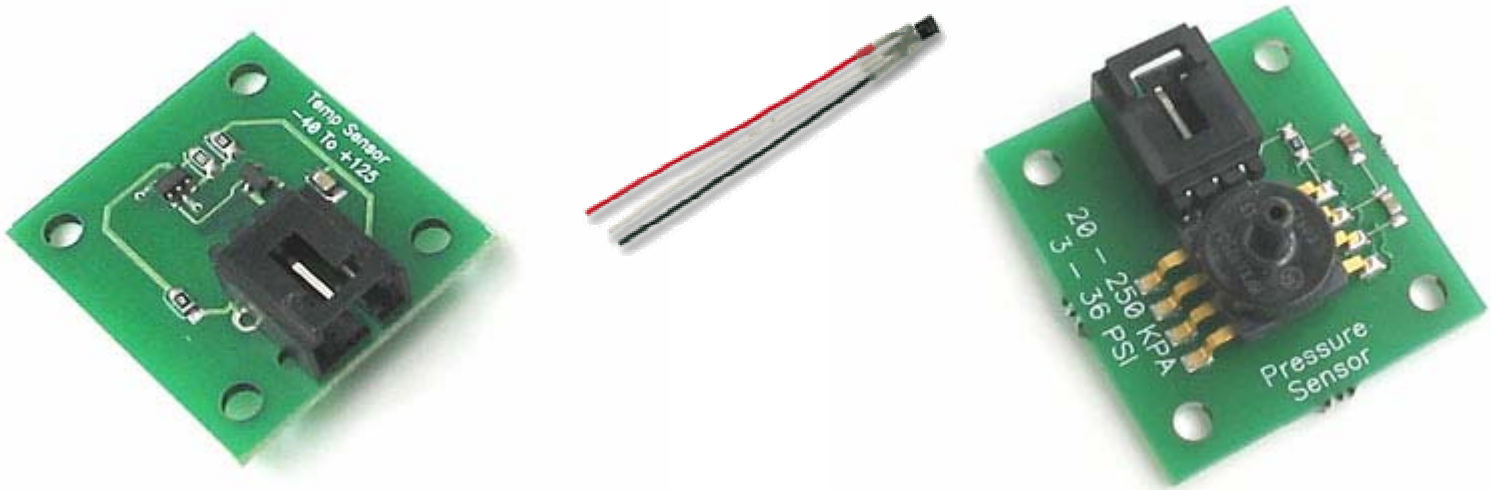
Biopotential

Example

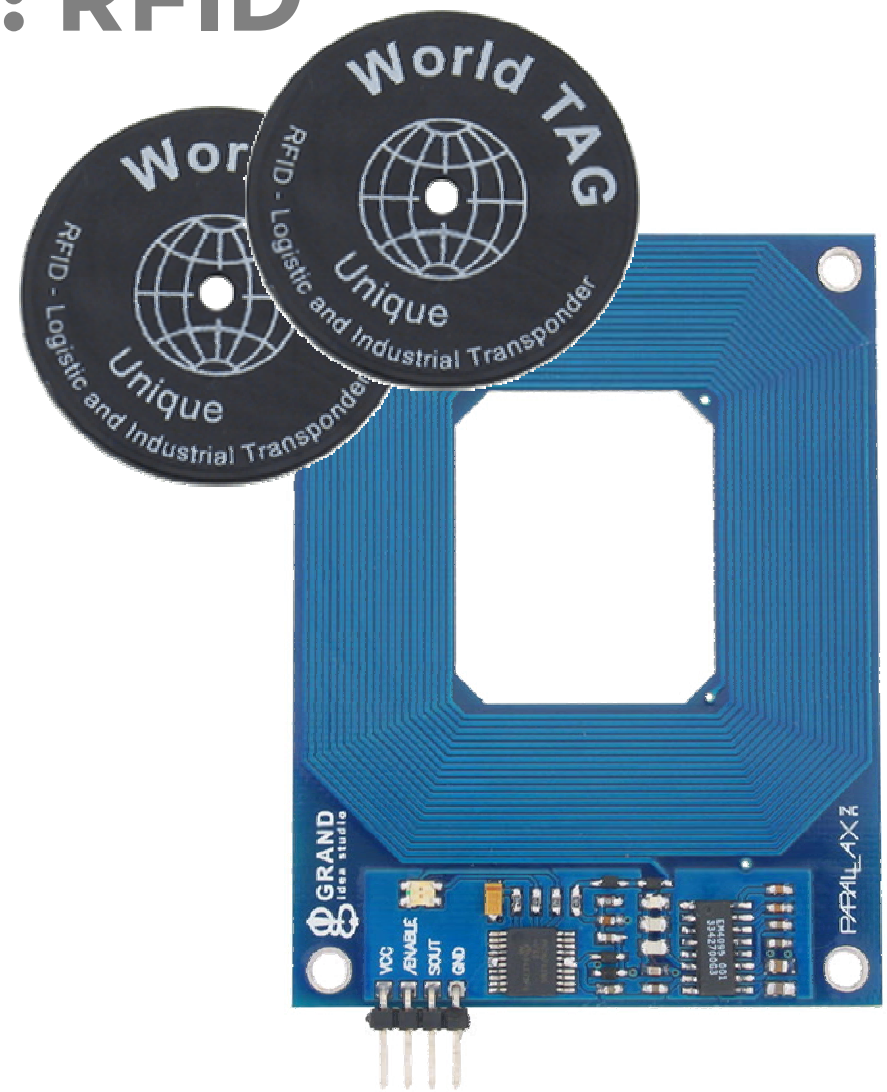
Wild divine video

Environmental Sensors

Temperature, gas pressure, humidity, etc: not very exiting for interaction design



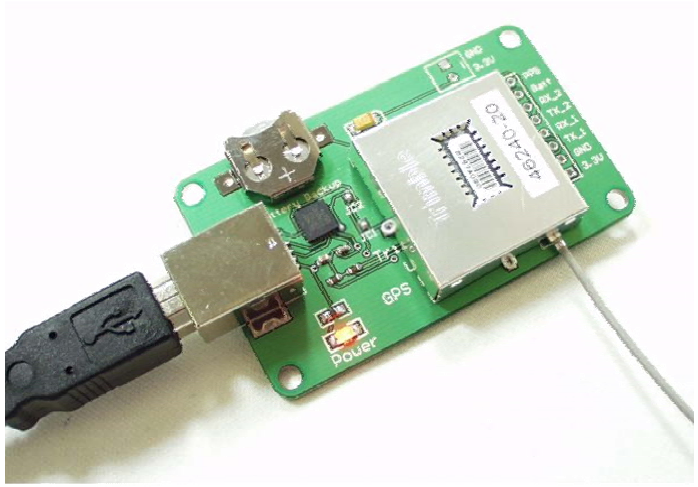
Identity: RFID



$30-40

GPS

- Outdoor Lat/Long positioning
- (Relatively) Easy serial protocol (NMEA) for reading data
- Starting at $100 now



Sensors to connect to your PC:

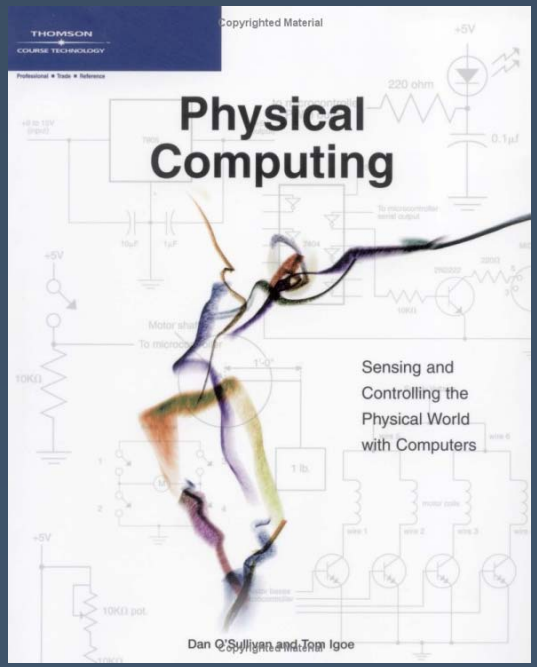
Cameras:
video or still

Microphone: sound pressure level (SPL)

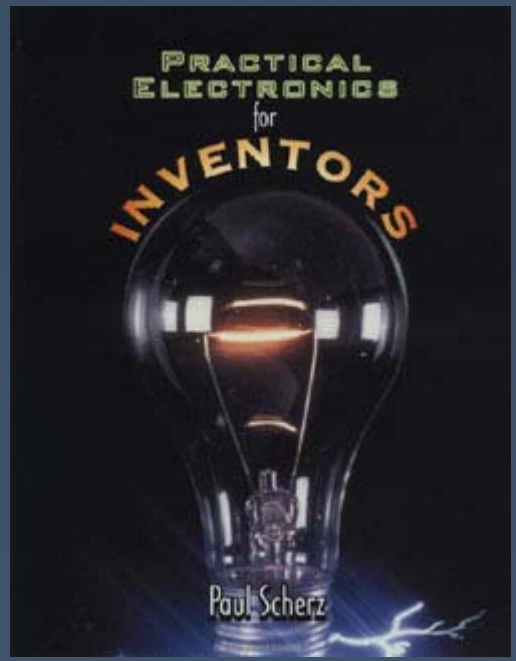
Sources:

- Local:
  - hobbyengineering.com (Millbrae)
  - jameco.com (Belmont, CA)
- Mail order:
  - sparkfun.com (prototyping, CO)
  - parallax.com (basic stamp, CA)
  - acroname.com (robotics company, CO)
  - phidgets.com (prototyping kits, Canada)
  - digikey.com (electronics wholesale, MN)

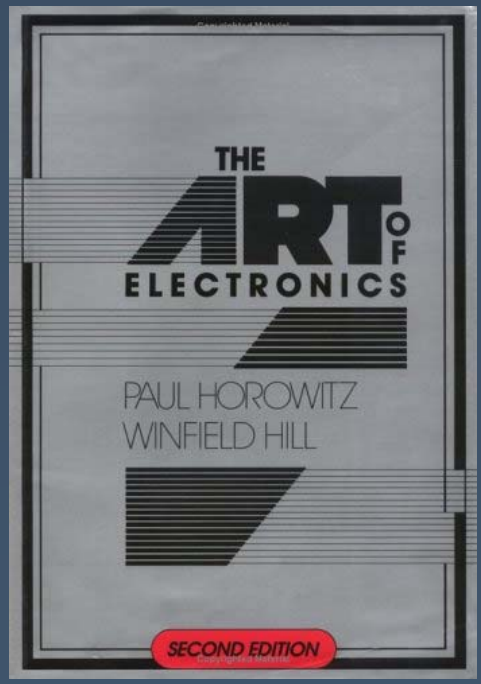
Reading Material



O'Sullivan & Igoe



Scherz



Horowitz & Hill

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