creativity & computation lab

week 8 || common sensing: input + output

review

WHERE WE HAVE BEEN

What we have done:

Review Ohm's Law + Intro Kirchoff's Law

What is a microcontroller?

Arduino

// the IDE

// the board

Digital vs. Analog

//INPUT = Switches + Variable resistors

//OUTPUT = PWM

Debugging

agenda

WHERE WE ARE GOING

What's on for today:

Sensors!

// Overview of different inputs

Actuators!

// Overview of outputs

Group work

Group presentations

last assignment

PRESENT

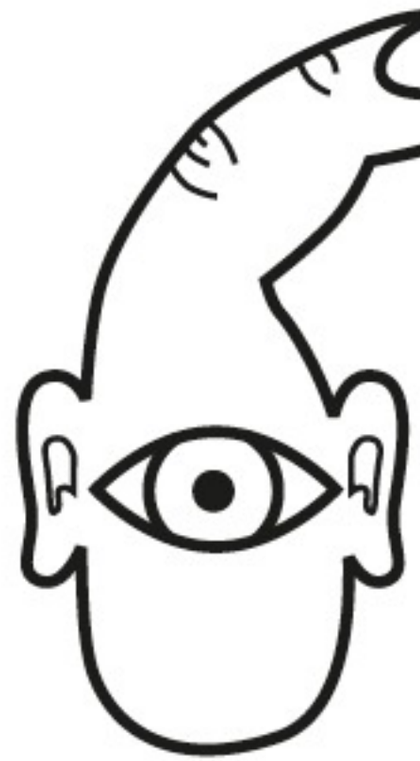
Tell us our fortunes!

Show us your animate objects!

sensors

common sensing

WHAT DOES A PERSON LOOK LIKE TO A COMPUTER?



breakout board

WHAT THE...

A breakout board is a PCB (printed circuit board) that the sensor has been mounted to because it is super small.

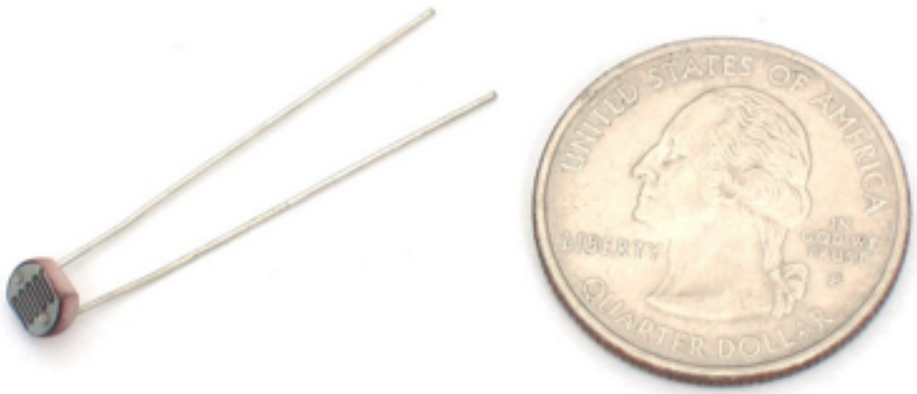
Breakout boards make our lives MUCH easier.

Many of these sensors will have breakouts.

seeing

photo cell

SEEING



pir motion sensor

SEEING

infrared proximity sensor

SEEING

//also called a Sharp IR sensor
// don’t forget to linearize that data

ultrasonic range finder

SEEING

listening to

good vibrations

microphone

LISTENING + SENSING VIBRATIONS

//can be input AND output. mind blown yet?

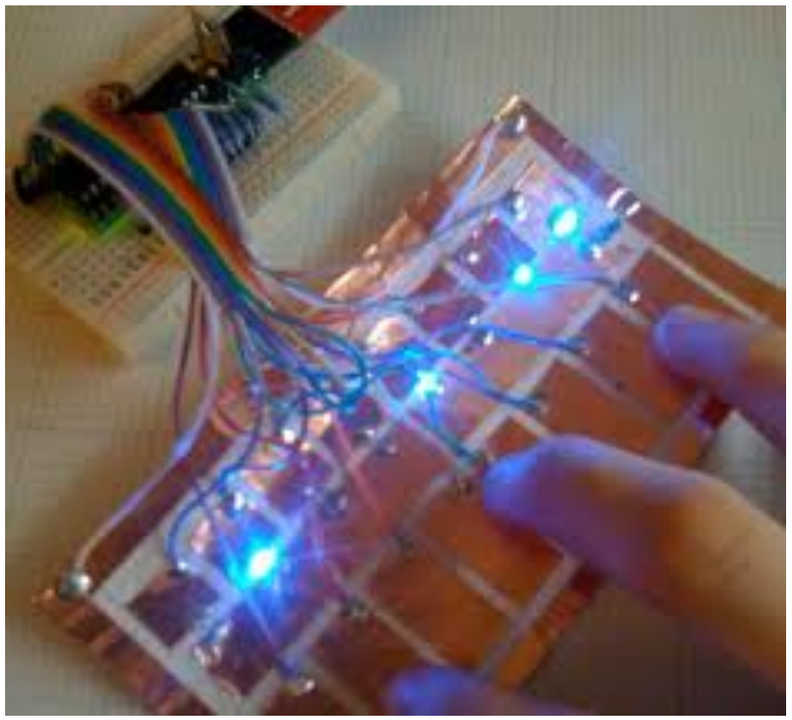
piezo vibration sensor

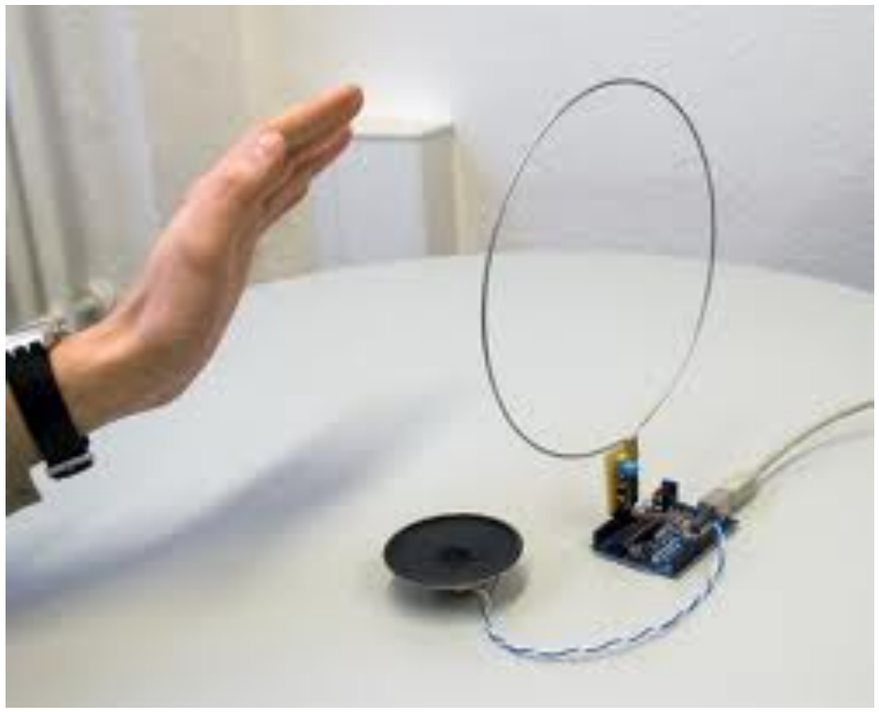
LISTENING + SENSING VIBRATIONS

touch

capacitance

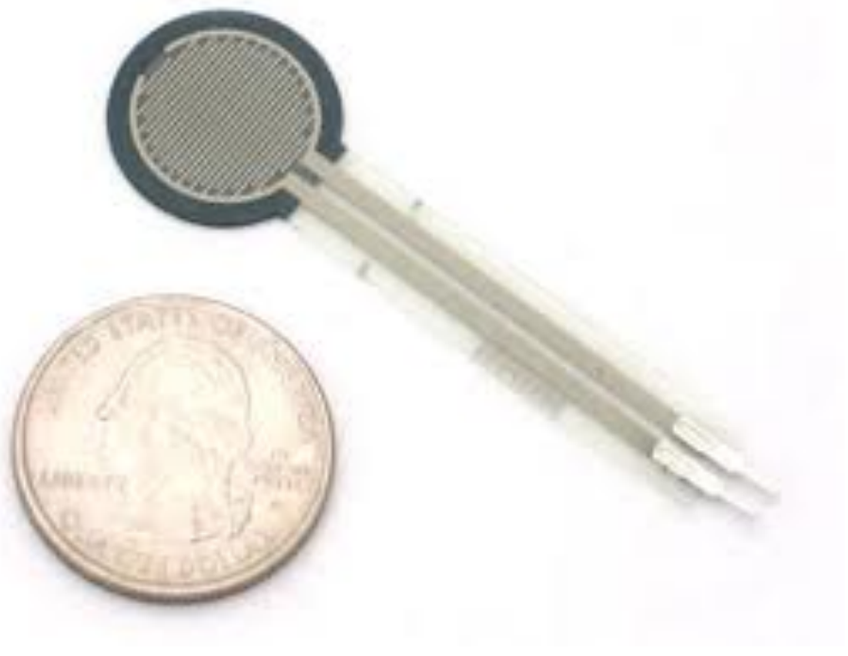
TOUCH

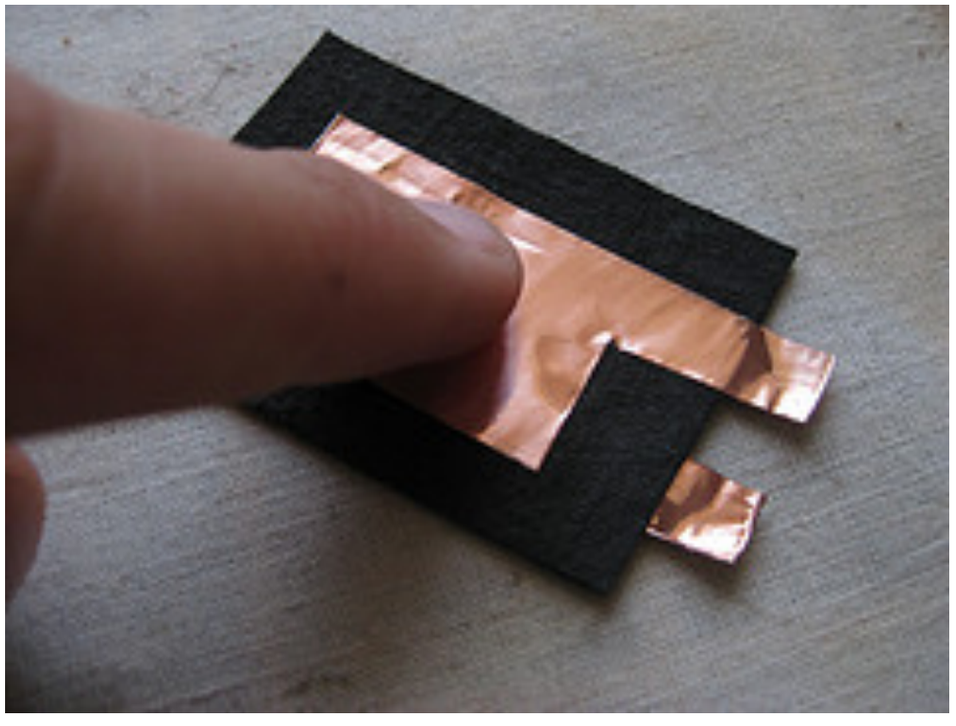




pressure sensor

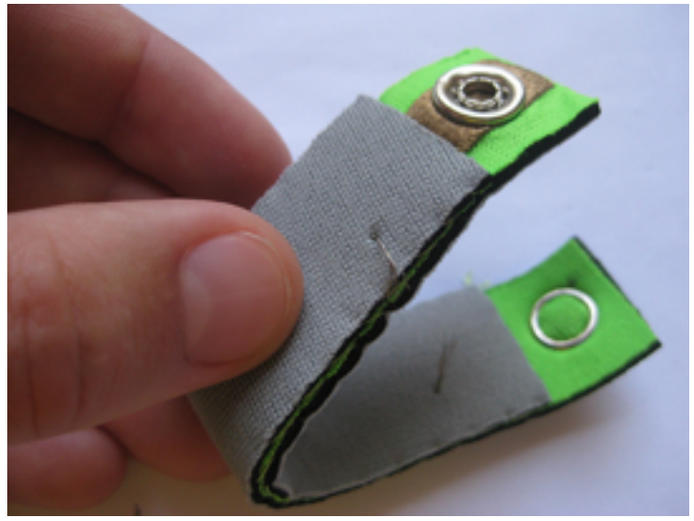
TOUCH





flex/bend sensor

TOUCH



weather

humidity

WEATHER

temperature

WEATHER

barometric pressure

WEATHER

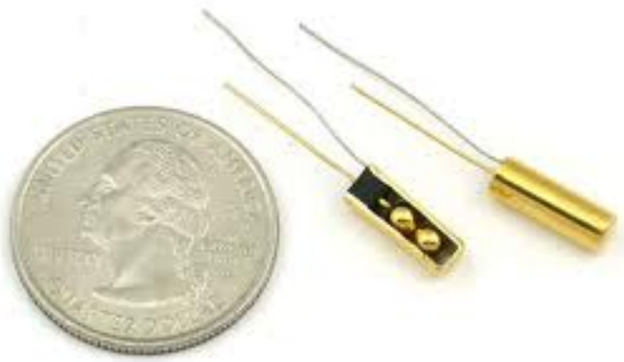
position

accelerometer

POSITION

tilt

POSITION

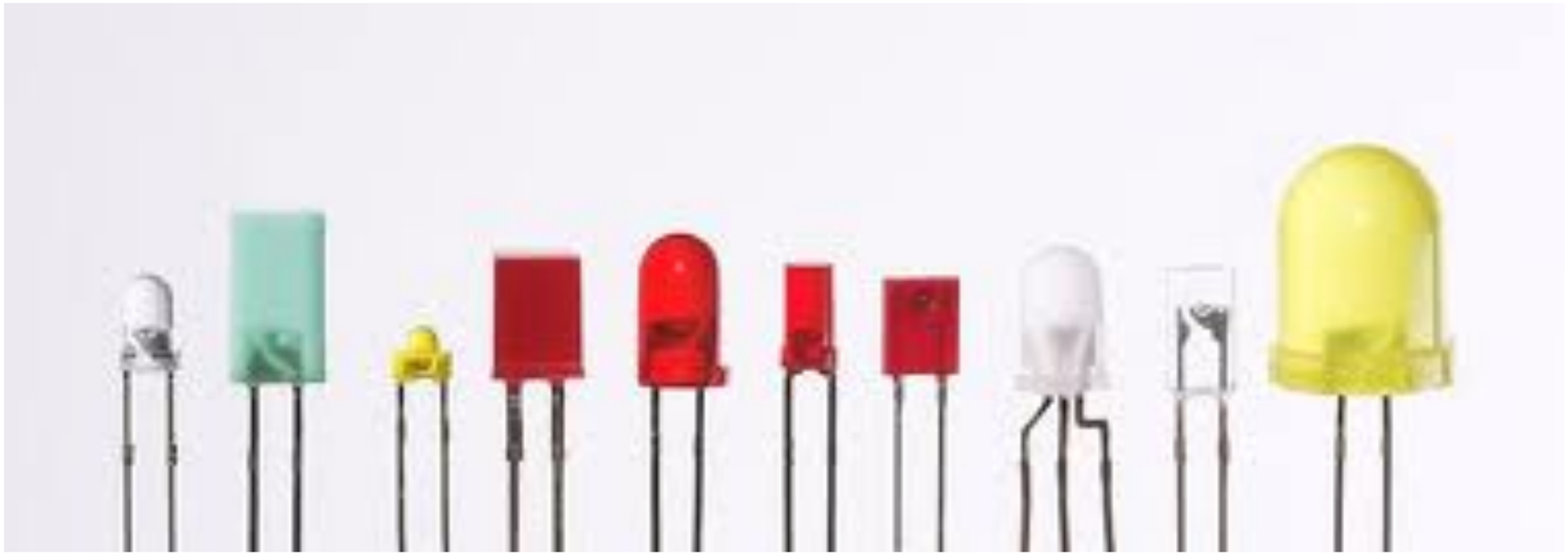


actuators

light

LED

LIGHT



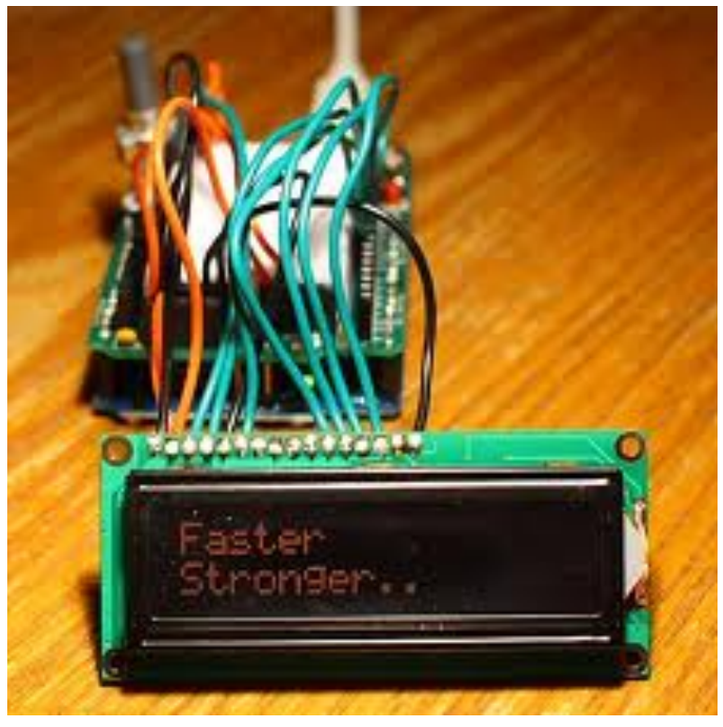
//this is not an option for later. too easy.

RGB LEDs

LIGHT

LCD screen

LIGHT



sound

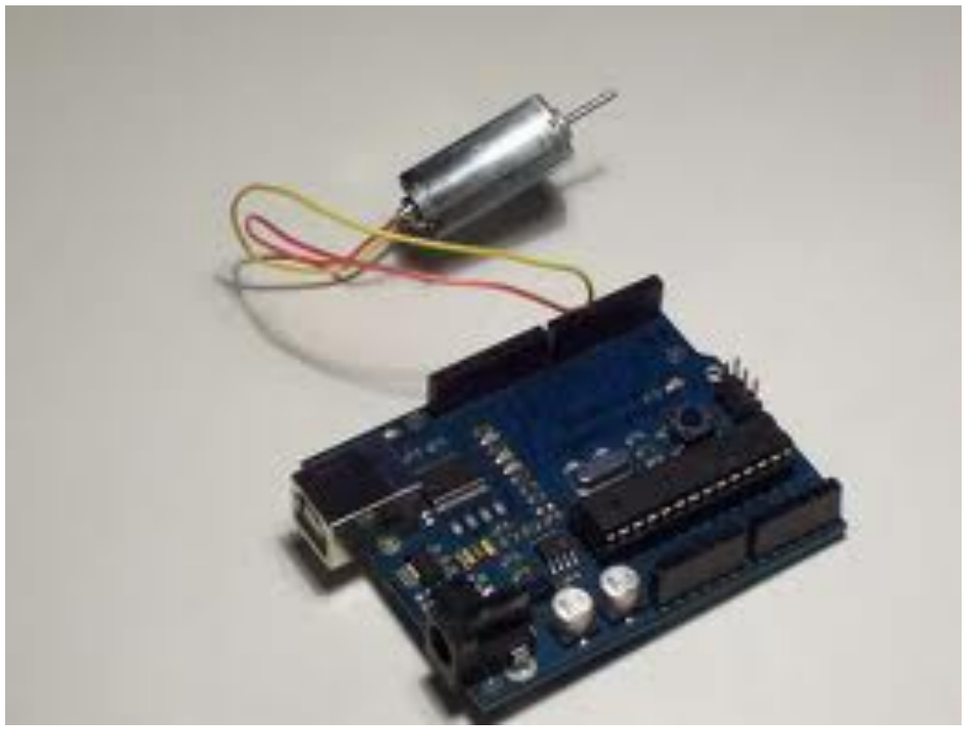
speaker

SOUND

motion

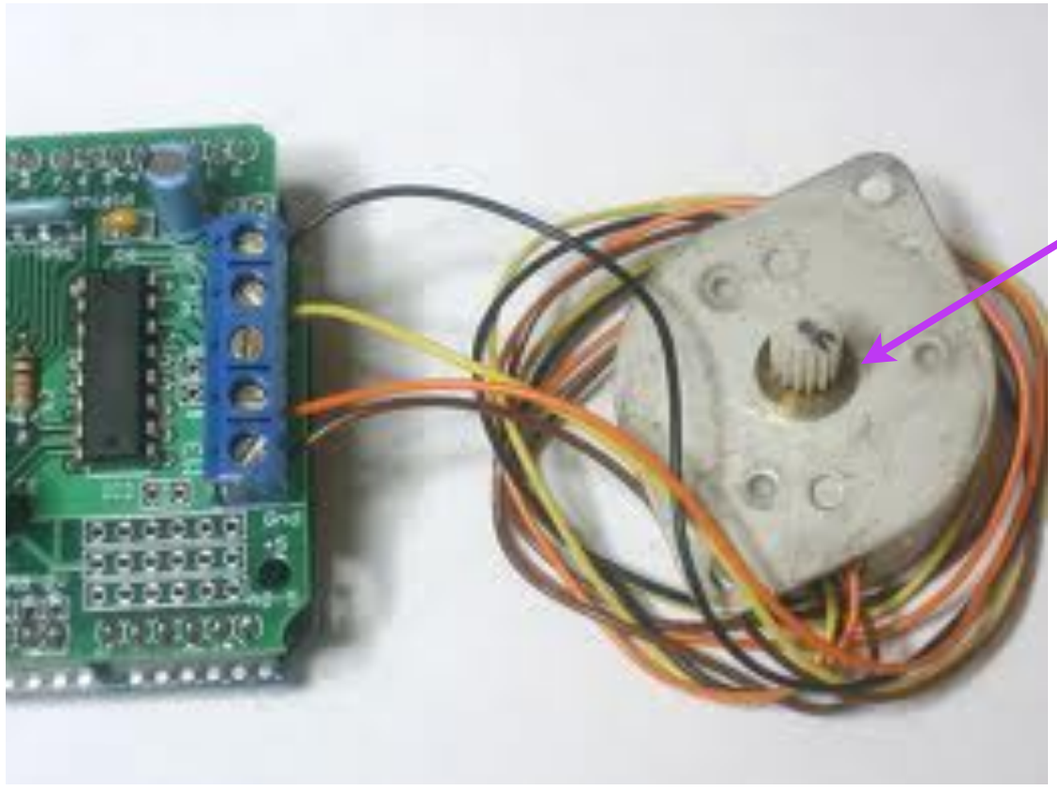
dc motor

MOTION



stepper motor

MOTION



servo motor

MOTION

//this might help radians make more sense...

your mission

GET US LEARNED!

Break out into groups of 3.

Each group must research one sensor and one actuator, construct a working example, and present it to the class.

your mission

GET US LEARNED!

In your presentation you should include things like:

- definition of what it does
- video documentation of your example
- common interaction design uses/user scenario
- a link to resources
- sample code
- link(s) to buy
- data sheet (from the link to buy!)
- any restrictions, caveats, awesome things we should know about

//imagine it's 1 am and you need a resource. what would you want to know?

resources

GET US LEARNED!

ITP Sensor Workshop

Arduino Playground

The Interwebs