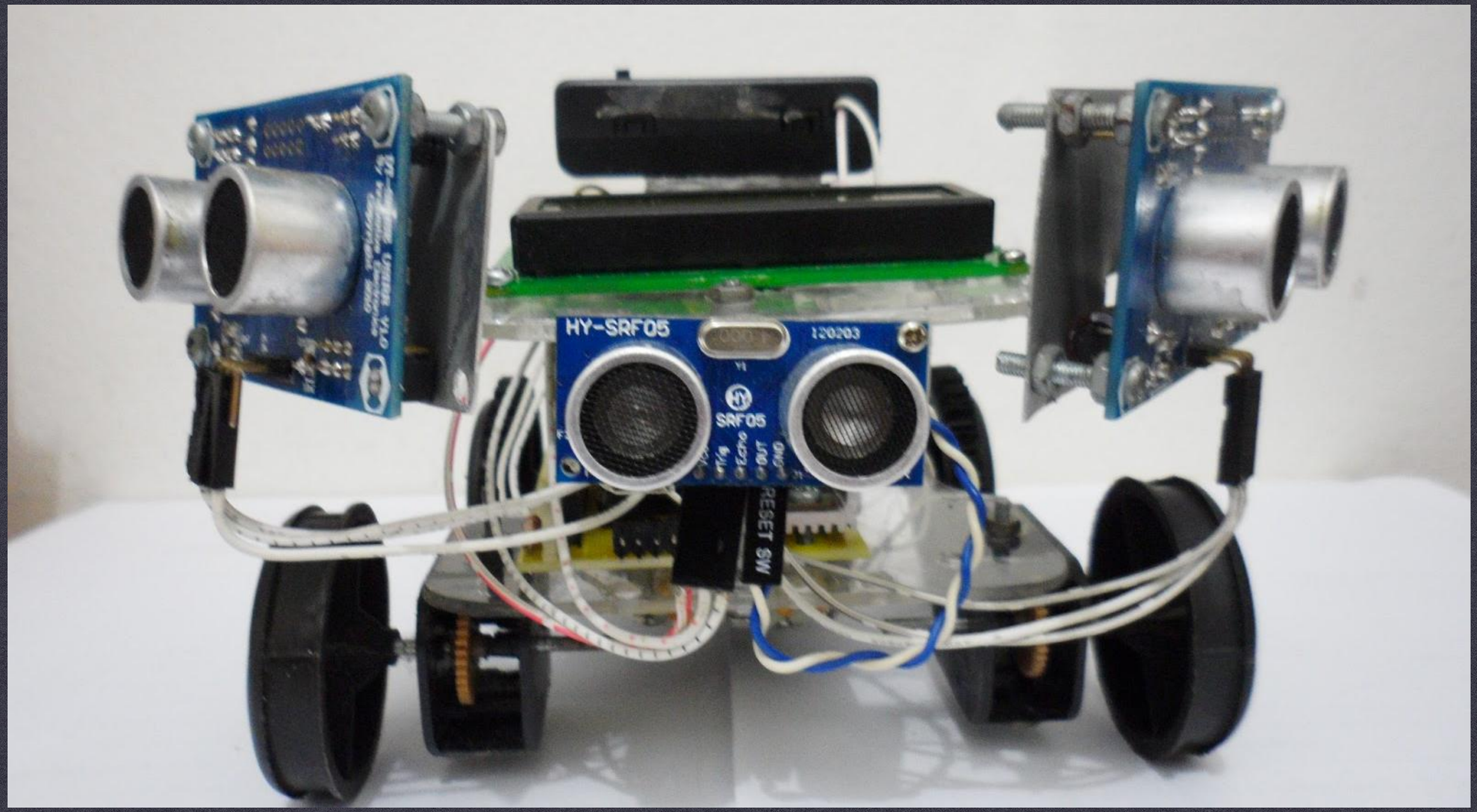


PROJECT

SENSORS

THE SENSE IS STRONG WITH THIS ONE

DATE	CLIENT
10/23/14	BILL BONNER

Sense

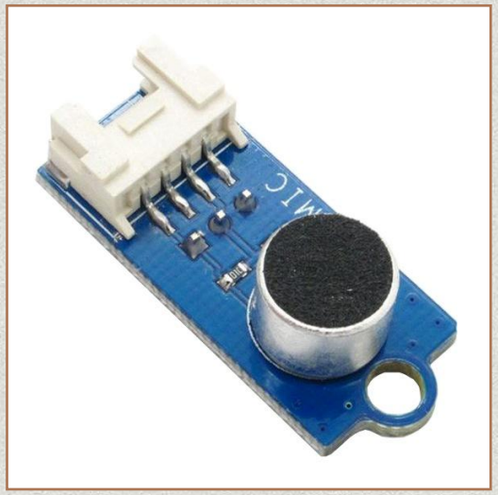
- Sense - a faculty by which the body perceives an external stimulus; one of the faculties of sight, smell, hearing, taste, and touch.

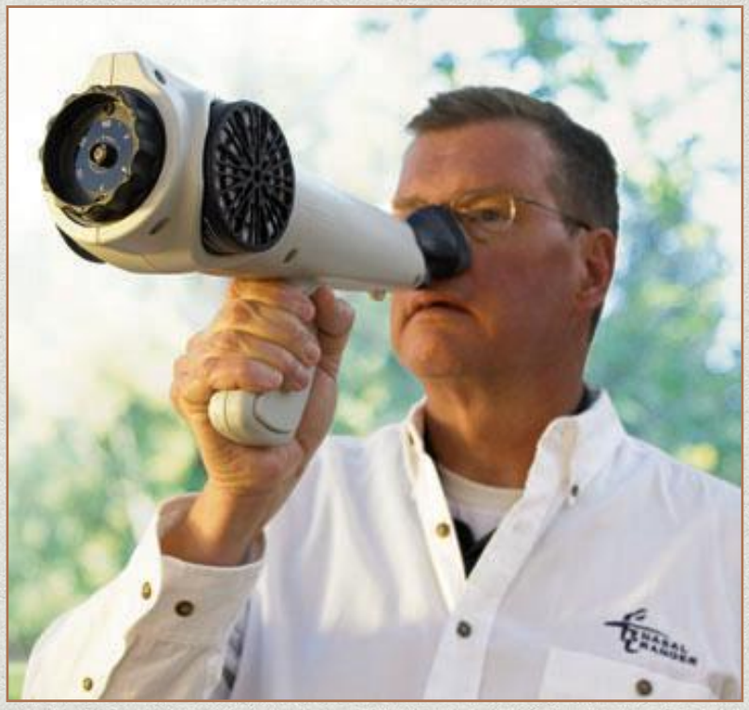
- Sensor - a device that detects or measures a physical property and records, indicates, or otherwise responds to it.

(courtesy of google)

The Five Senses

- Camera
- Microphone
- Button
- Olfactometer

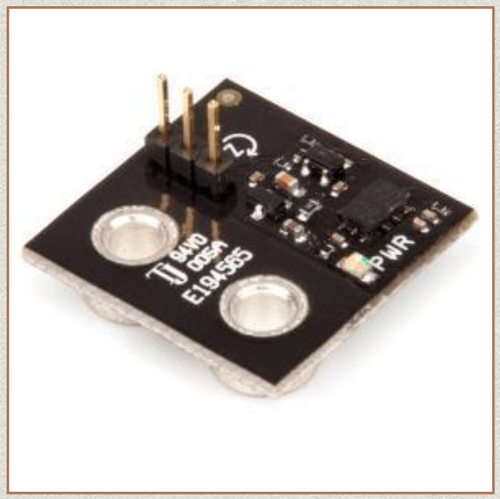




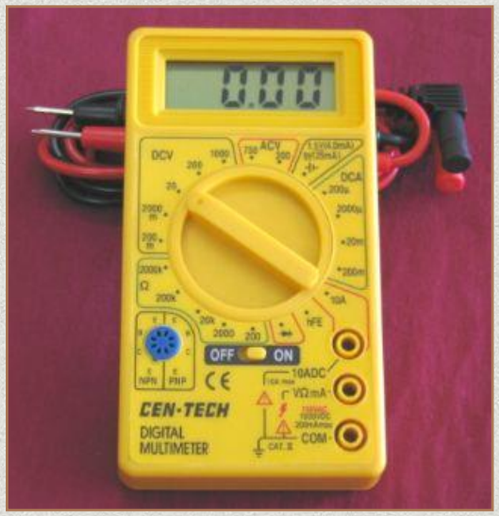
Measurable Stimuli

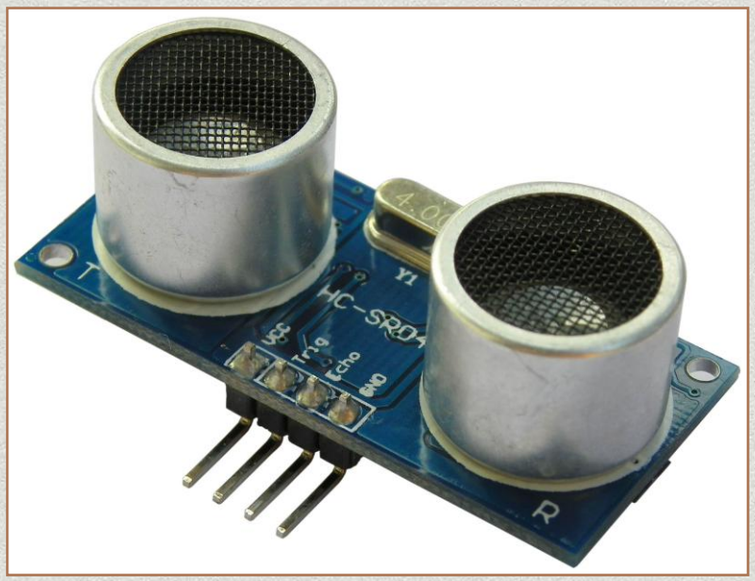
Stimulus	Quantity
Acoustic	Wave (amplitude, phase, polarization), Spectrum, Wave Velocity
Biological & Chemical	Fluid Concentrations (Gas or Liquid)
Electric	Charge, Voltage, Current, Electric Field (amplitude, phase, polarization), Conductivity, Permittivity
Magnetic	Magnetic Field (amplitude, phase, polarization), Flux, Permeability
Optical	Refractive Index, Reflectivity, Absorption
Thermal	Temperature, Flux, Specific Heat, Thermal Conductivity
Mechanical	Position, Velocity, Acceleration, Force, Strain, Stress, Pressure, Torque

Robot Senses



- Accelerometer/Gyroscope
- Ultrasonic Rangefinder
- Hall Effect Sensor
- Voltmeter
- Thermistor





Choosing a Sensor

- Accuracy
- Calibration
- Cost
- Environment
- Range
- Repeatability
- Resolution

Today's Sensors

- Photoresistors
  - Light sensitive variable resistors with up to a Mohm in pitch black to a few hundred ohms in direct light
- Microswitches
  - Limit switch with normally open and normally closed connections

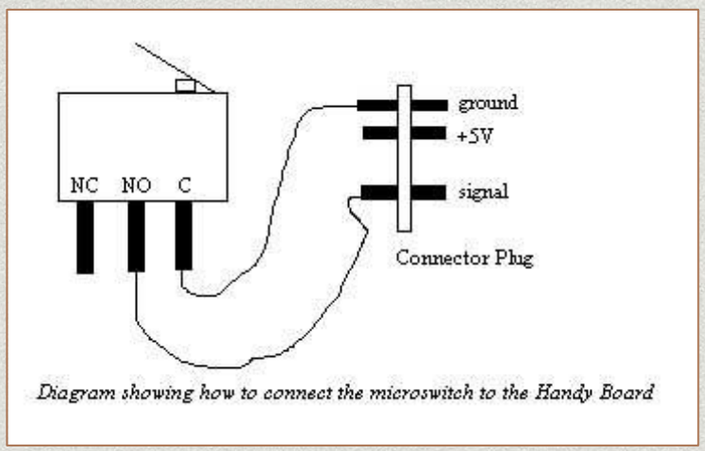


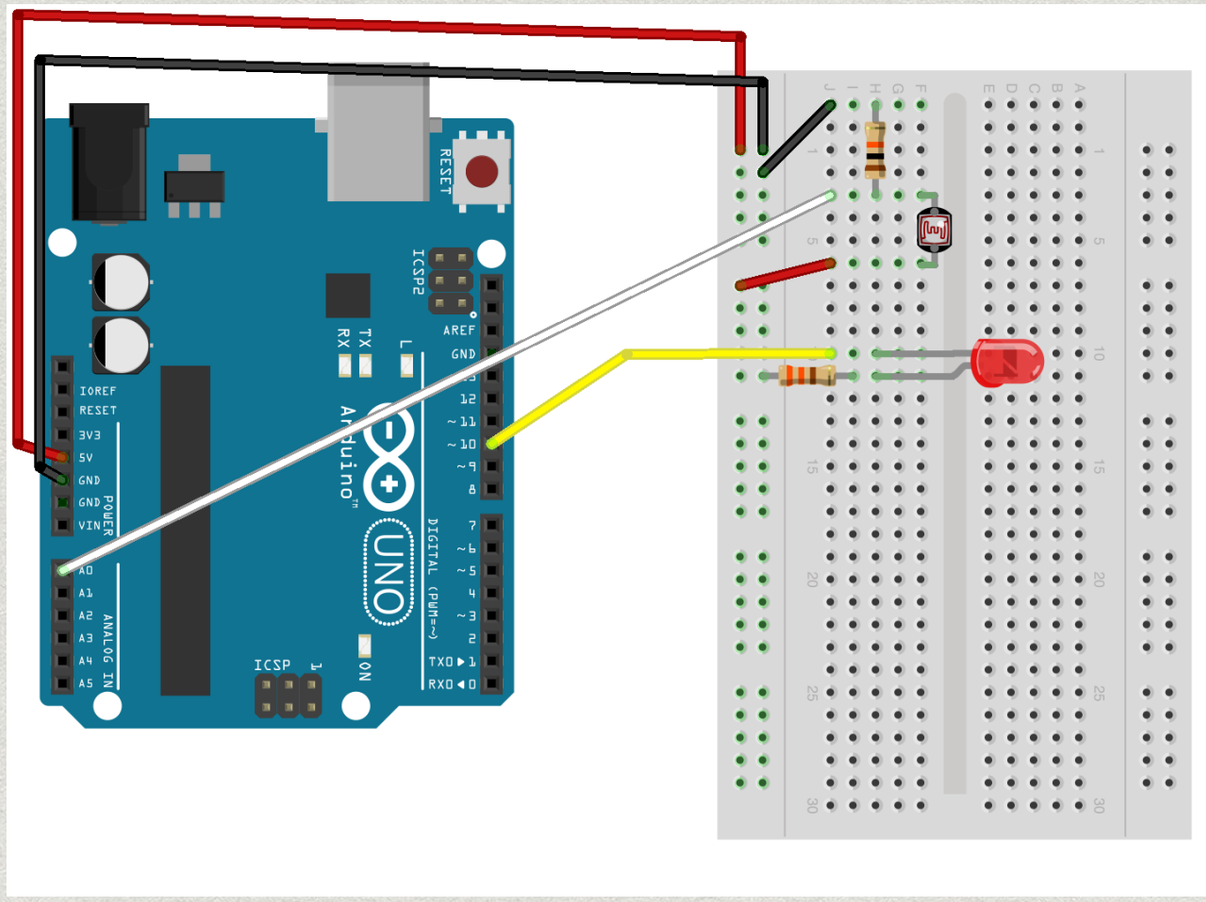
Diagram showing how to connect the microswitch to the Handy Board

- Ultrasonic Rangefinders
  - Measures distance by the time it takes for a sound wave to be reflected back

Projects – Beginner

- Construct a circuit that will let the brightness of an LED be proportional to the photoresistor's readings

- Functions Needed:
  - analogRead()
  - analogWrite()



Projects - Intermediate

- Make a brightness following robot using the robot bases we built in week 5 and photoresistors.
- Make a wall following robot using the same robot base and microswitches.

Projects - Advanced

- Make a wall following robot using an ultrasonic rangefinder.