

# **Electronics Workshop**

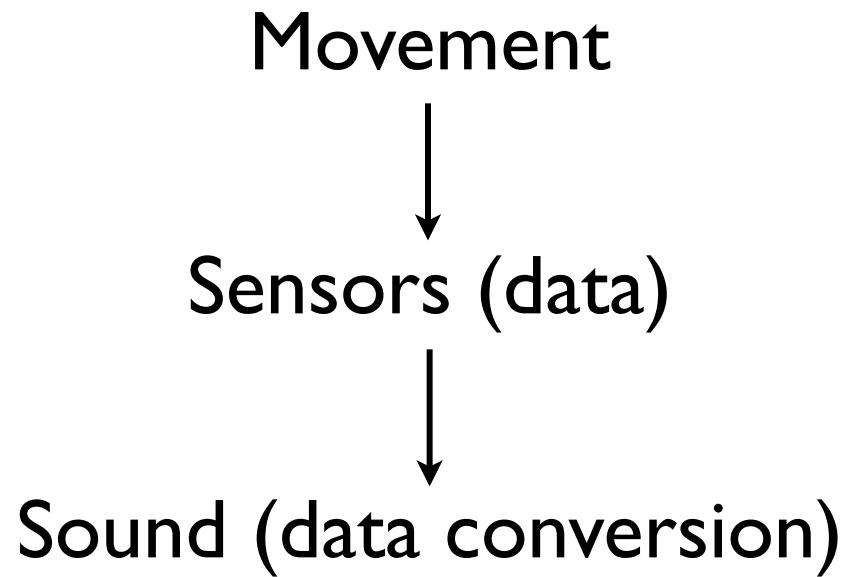
# **Sensors: Bodies Creating Sound**

Creative Academy - Spring 2013

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# Introduction

# The Basics

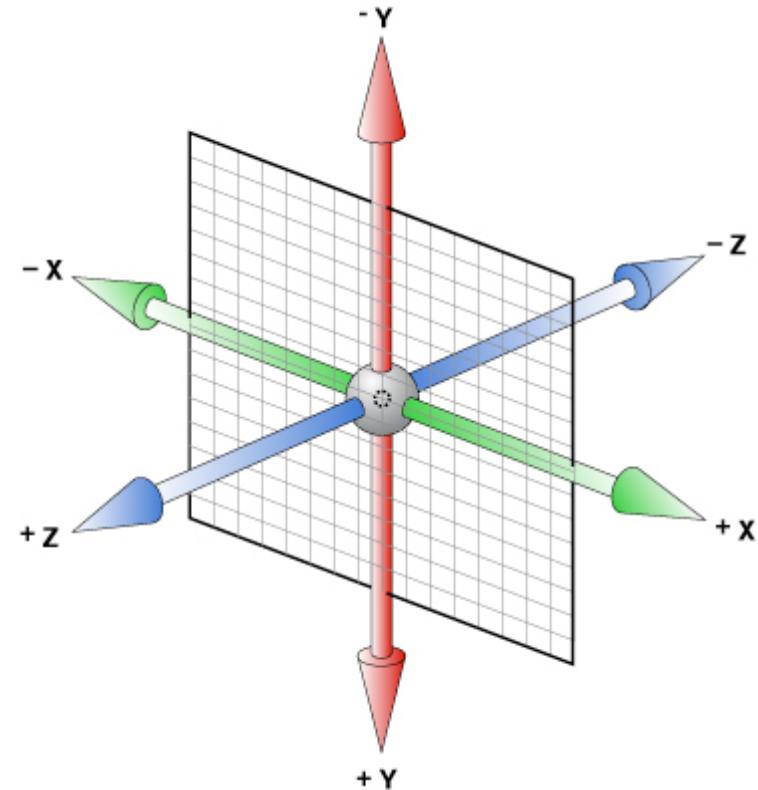


# Sensors (data)

- Numerical way to measure the physical world
- Types
  - Proximity
  - Light
  - Flex / Bend
  - Force
  - Acceleration

# Accelerometer

- 3-dimensional motion
- Relative to gravity
- Measures:
  - Acceleration
  - Direction of acc.
  - Orientation



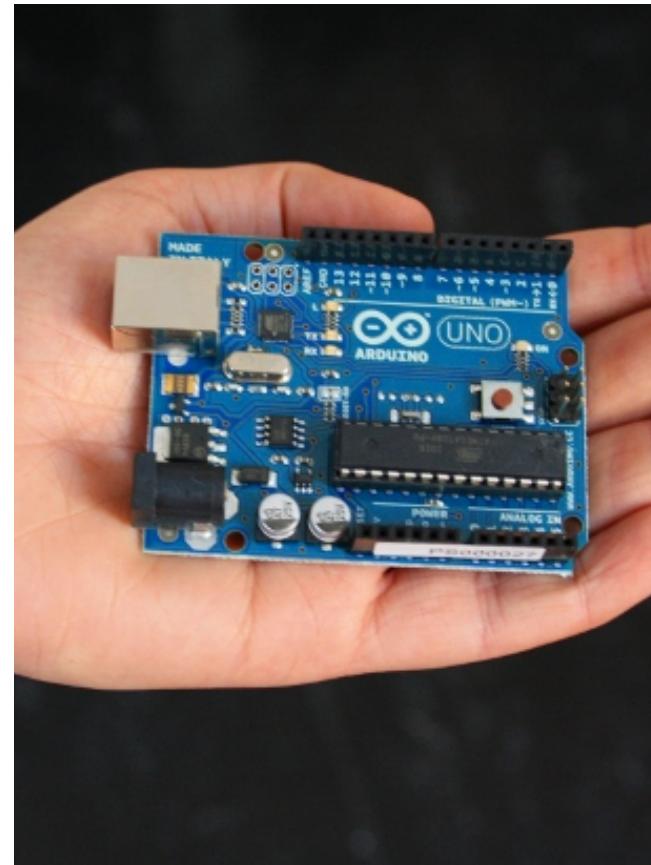
# Sound (data conversion)

sensor data =  
numbers that fall within a specific range

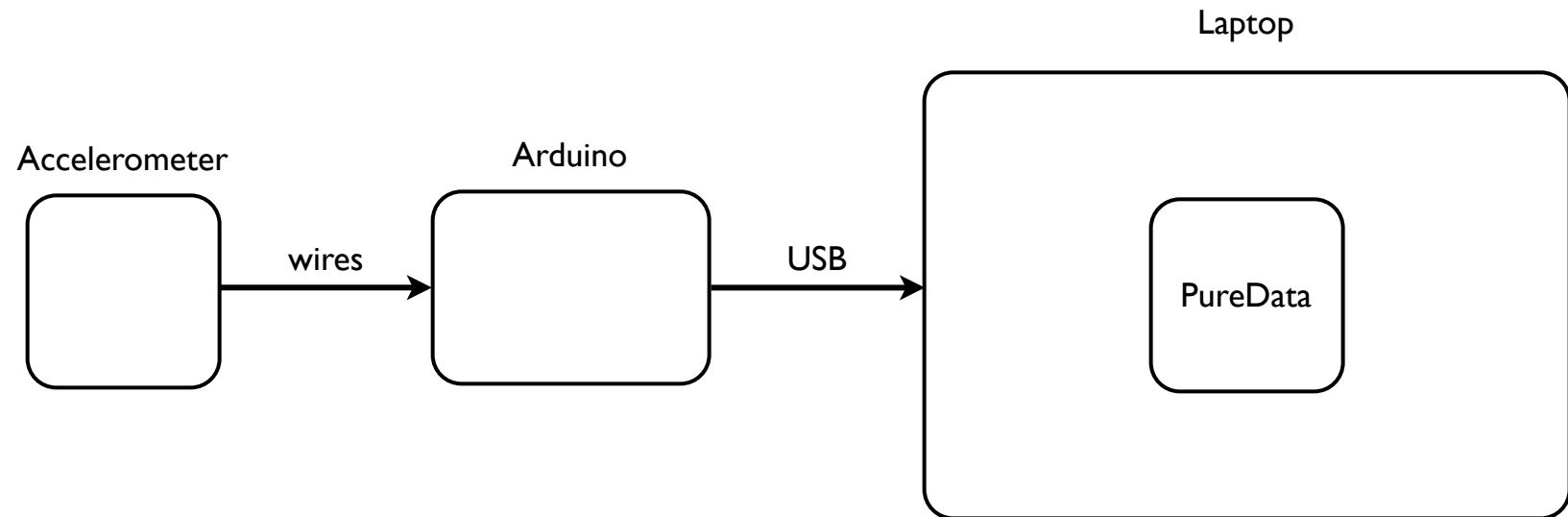
- Direct relationships
  - frequency (pitch)
  - volume
  - mix of an effect  
(reverb, etc)
- Indirect relationships
  - triggers
  - generative
  - algorithms

# MISSING LINK: Arduino UNO

- Microcontroller that can receive input from sensors
- Relays data to software on our computer
- Sound will be generated by software (PureData)



# Basic Setup



# Demo

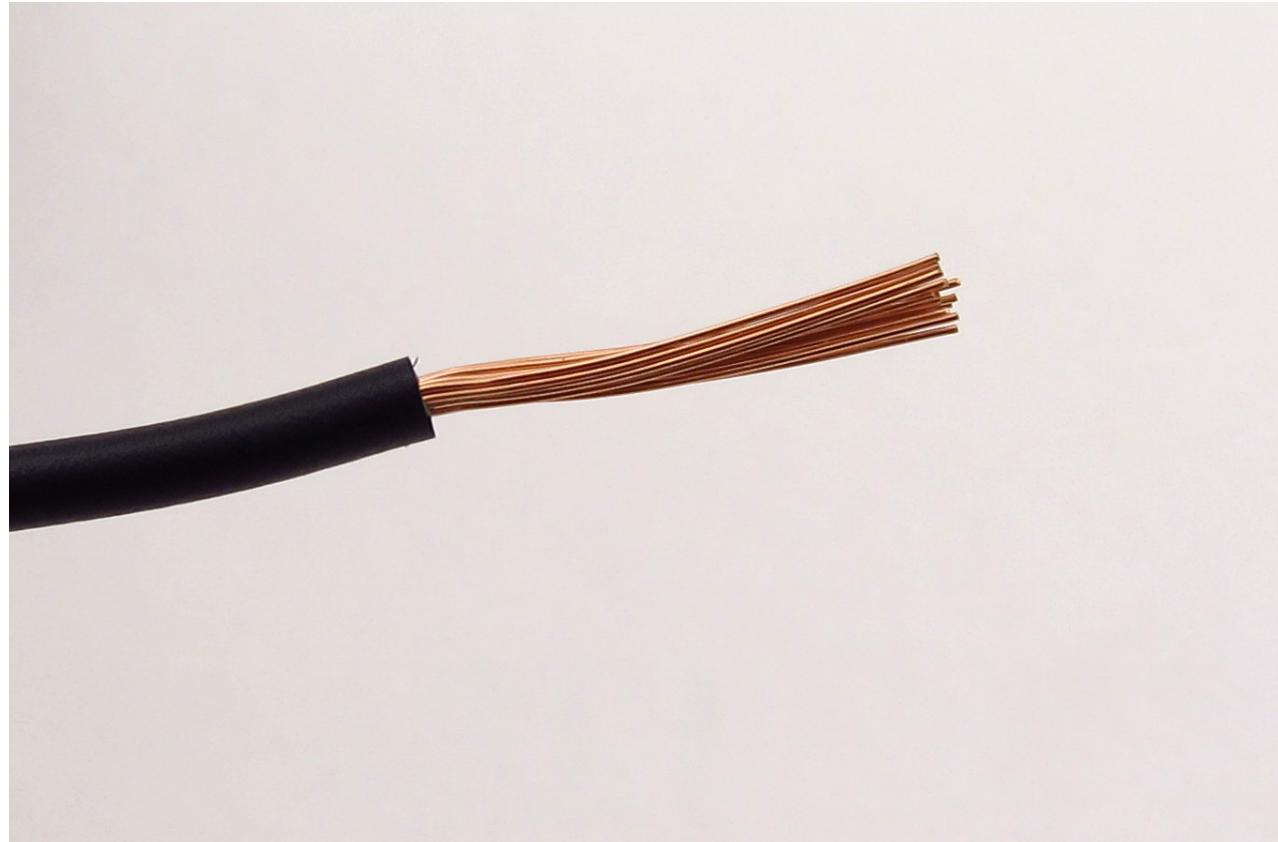
# Kit Checklist

- Accelerometer
- 5 different colored wires
- Arduino UNO
- USB cable
- 10K Ohm resistor (I have these)

# Prepare the Accelerometer

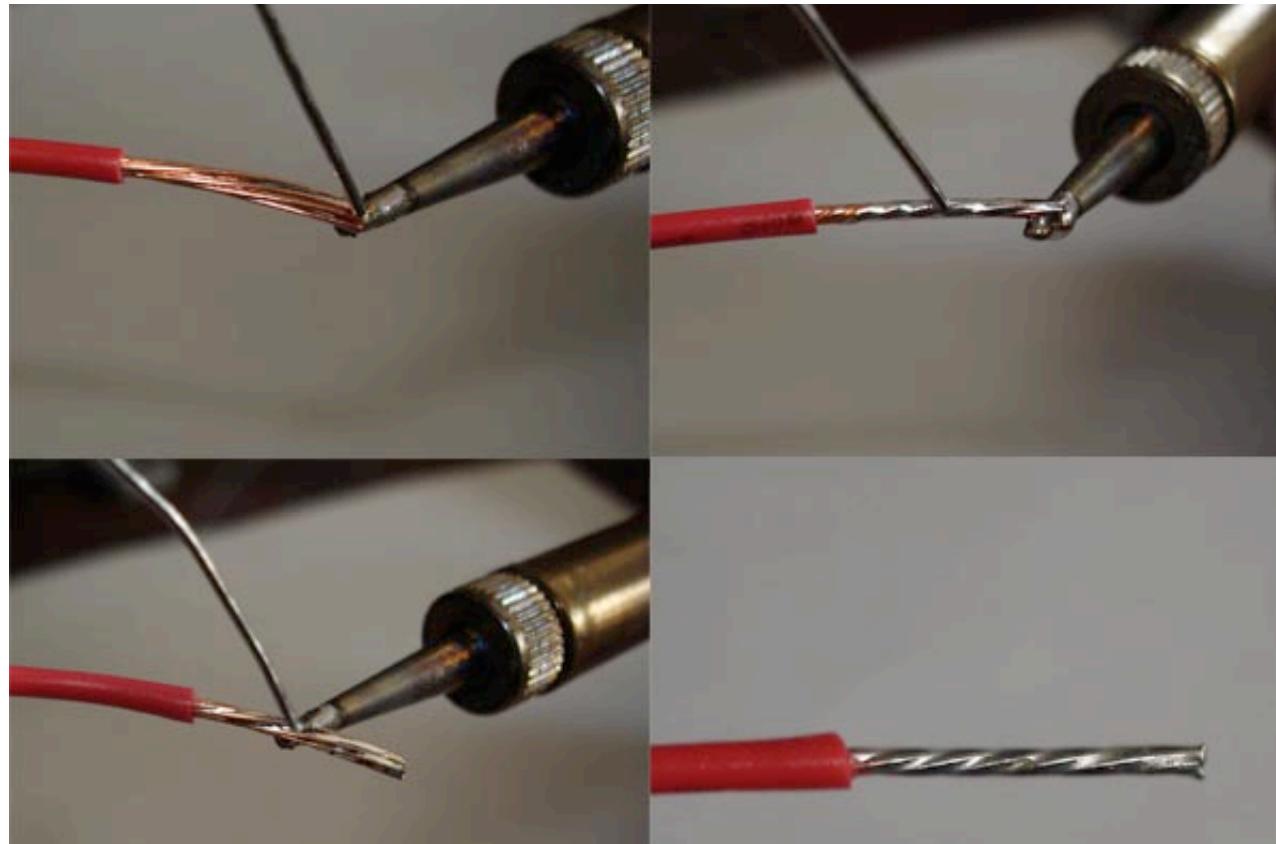
1. Strip and tin wire
2. Solder wire to accelerometer
3. ‘Pull up’ SLP pin using 10k Ohm resistor
4. Braid wire strands together

# Strip the Wire



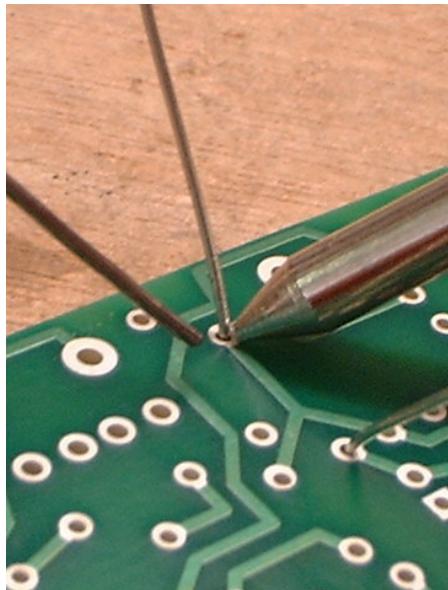
1. Careful not to cut through wire
2. Strip both ends

# Tin the Wire



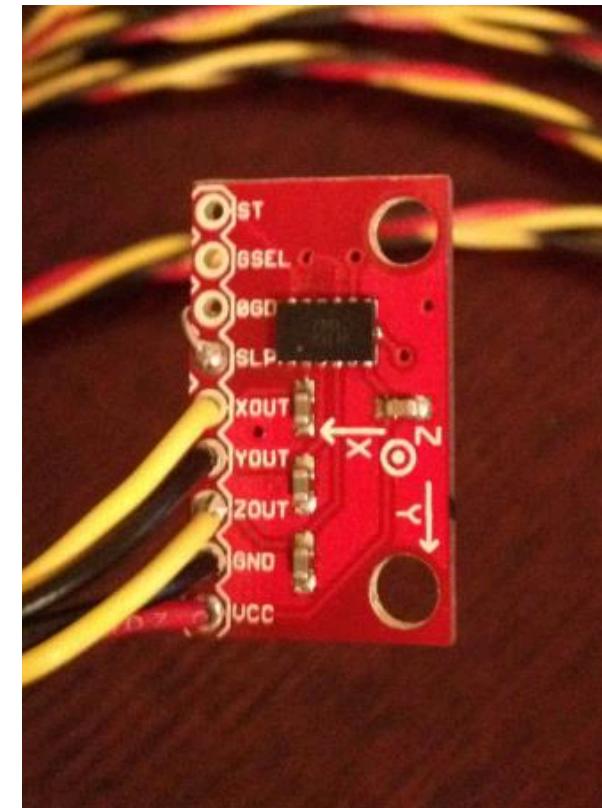
1. Soldering iron heats the wire
2. The wire melts the solder

# Solder to Accelerometer



Heat junction of wire and solder pad first, then touch solder to the junction

- Red = VCC (power)
- Black = GND (ground)
- Other colors for three axes
  - XOUT
  - YOUT
  - ZOUT

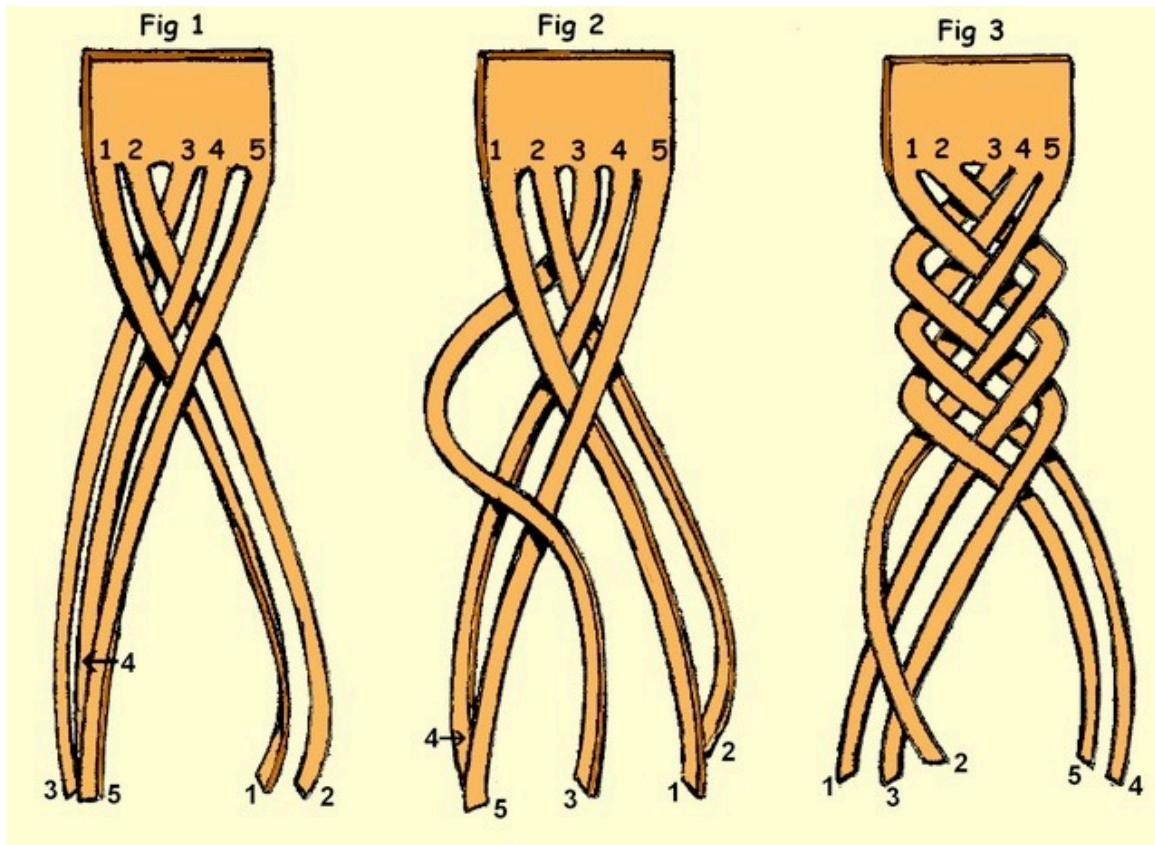


# Connect VCC to SLP via Resistor

- Solder one end of the resistor to the SLP pin
- Solder the other end to the VCC pin
- Sensor won't work without this step



# 5-strand Braided Wire

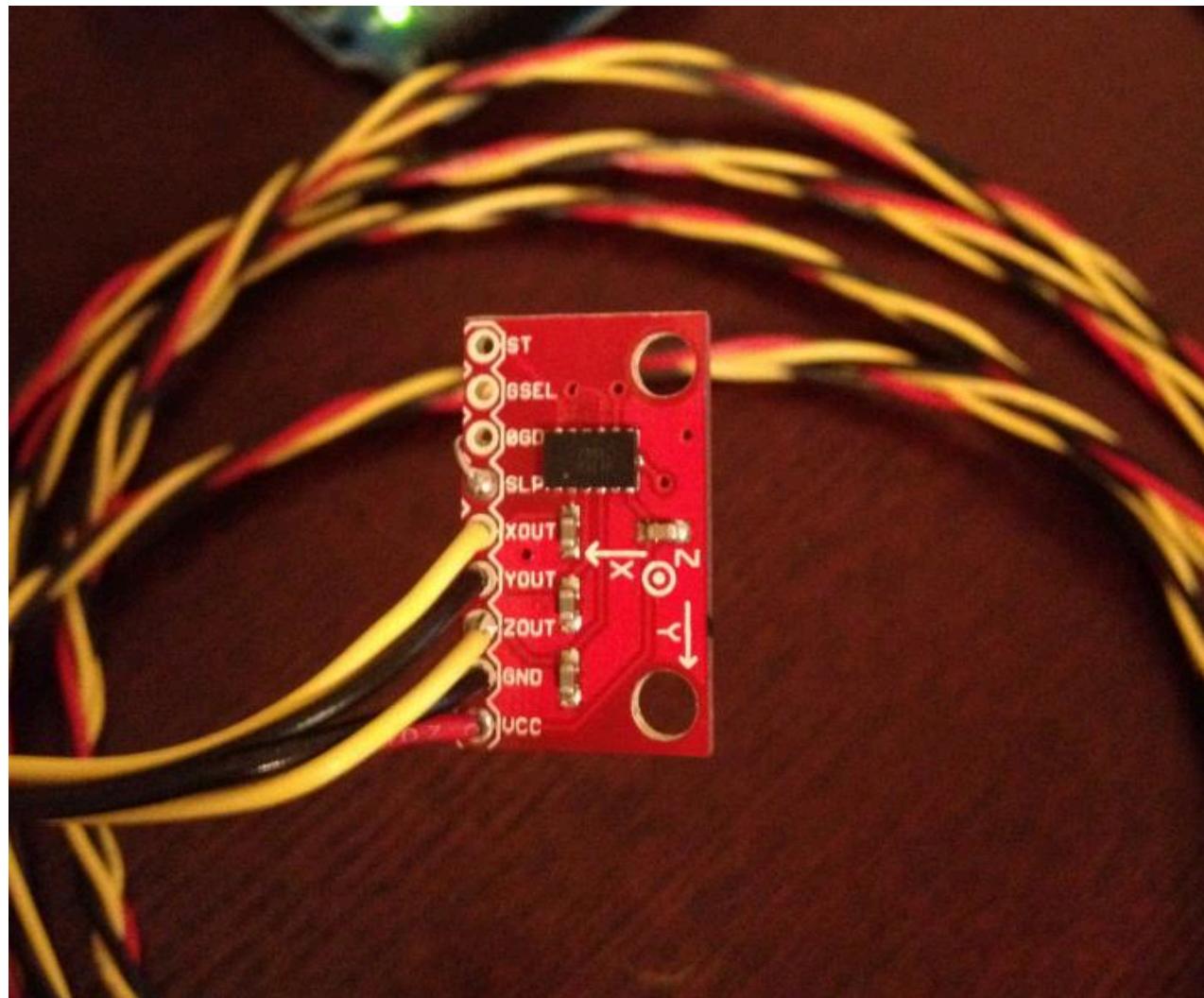


1. Arrange the wire as illustrated in Fig 1 (approach in this order: 3, 2, 4, 1, 5)
2. Bring wire 3, on the extreme left, to the center, over wires 4 and 5 (fig 2).
3. Bring wire 2, on the extreme right, to the center, over wires 1 and 3.
4. Carry on braiding, first with the outside left wire, then with the outside right one.  
Every time you do this ensure you are passing over two wires.

# Heat Shrink (optional)



Helps to tie off the braids



Done!