Research for using Piezo electric sensor on Arduino.

I found a bunch of articles about the knock function on the Arduino. It uses a piezo electric element to convert sound to a voltage. The Arduino listens to this and outputs a string when the reading goes above a certain threshold. It seems very simple and just requires a 1MOhm and the sensor. They use the ground and analog pins. Below is the link to the tutorial.

<http://www.arduino.cc/en/Tutorial/KnockSensor>

Here the code is provided and we can modify it to suit our applications. Looking around others have also modified it before and here you can find another tutorial for a slightly modified version of knock:

<http://www.instructables.com/id/Arduino-Sensors-and-MIDI/step10/Arduino-and-Piezo-Sensor/>

This guy set up a system that goes into the digital pins and has variable sensitivity by using a POT and OP amp:

<http://davidhoulding.blogspot.com/2014/02/high-sensitivity-vibration-sensor-using.html>

The key thing with these designs is that we need to modify the code so we can pull the time stamp and voltage reading to a txt file that matlab can then read and analyze. I do not know how to code in c or whatever Arduino uses so I will need some help here.

The other option we looked at was soldering the headphone jack right on to the sensor. It didn’t work last night and I have a few ideas why.

1. The wire. I am not fresh on this stuff but headphones use a super small gauge wire that has a very low impedance I think. When we look at the Arduino file for the tones tutorial, I notice they use a 100 Ohm resistor on the element to drive it; however, when they listen, they use a resistor in the mega Ohms range. With that in mind I don’t think we can drive the piezo and directly connect it to the microphone/headphone jack without somehow moderating the voltage readout. Again, I haven’t really looked at electronics since sophomore year 3 years ago so I can be totally wrong.
2. Yesterday we just plugged it in the microphone jack. This maybe dumb but did we ever switch the selected microphone in the computer settings. That may be the reason we kept getting sound from the comp and not the piezo device.
3. As mentioned in one, I really don’t think we can just plug in the device and expect it to work. Honestly, it just can’t be that easy. Not in our major lol

So yeah, I think it will honestly be easier to modify the code on the Knock program from Arduino than to figure out how to just plug the strip into the device. Let me know what you all think