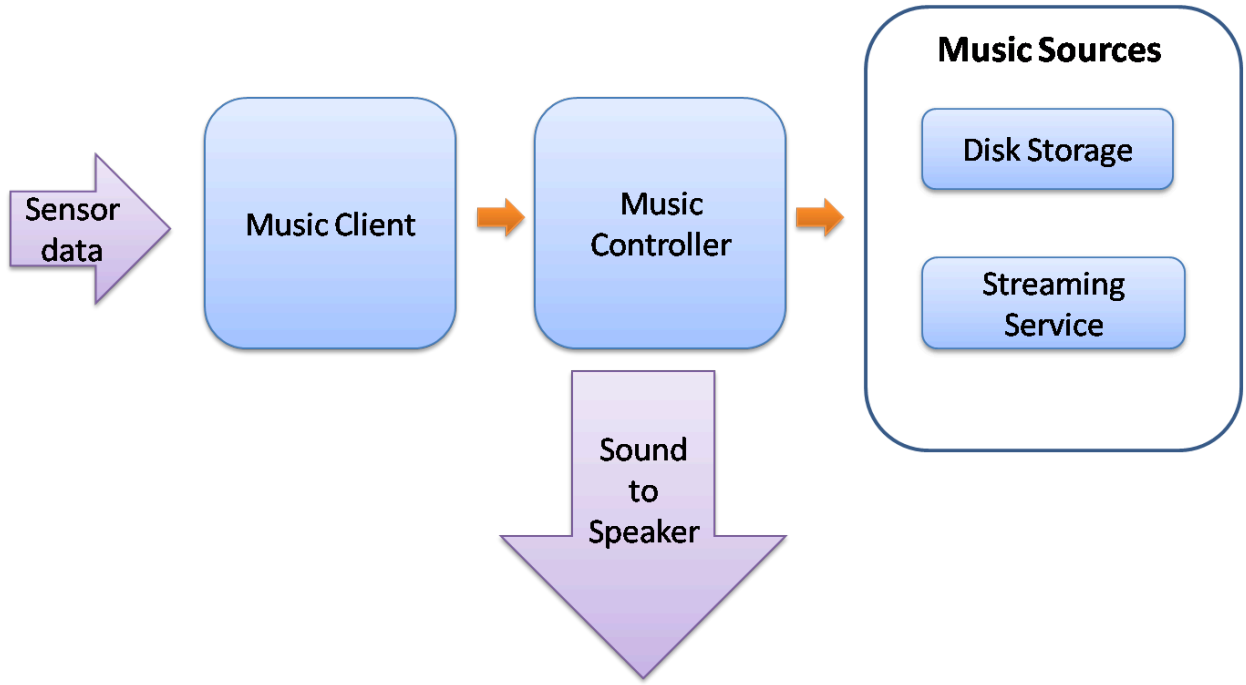
Software Design

Diagram
sensors → arduino → music client → music controller program → music storage(on SD card, HD or streaming)



High Level Overview
Music Client:

- program that interfaces with the arduino(microcontroller with sensors)
- takes in sensor data from arduino and converts them to commands to send to the music controller program
- this will be written in python

Music Controller Program:

- command line programs that lets you control music on the hard disk or from the internet
- we are using pre-existing open source programs programs for this part
    - mplayer, mpd, mpc

Music storage:

- in the basic version, music will be loaded directly into the SD card or an external hard drive, which the raspberry pi will play from
- if there is time, we can make a web interface to interactively select music to put into the radio

Workflow:

A person turns a knob on the radio, this sends a signal to the Arduino(see hardware design) and converts that to sensor data to be sent to raspberry pi. The music client program running on the raspberry pi will interpret the sensor data and send commands to the music controller program for how to change the music. The music controller will be playing music that is preloaded onto the SD card/external storage storage, or it can stream music online.

Need to buy:

- ethernet cable
    - $6
    - http://www.amazon.com/AmazonBasics-Cat5e-Ethernet-Patch-Meters/dp/B001TH7GVE/ref=sr_1_1?ie=UTF8&qid=1382304657&sr=8-1&keywords=ethernet+cable
- wifi adapter
    - need wifi adapter or ethernet cable, but we can get both since they're both pretty cheap
    - $10
    - http://www.amazon.com/Edimax-EW-7811Un-Wireless-Adapter-Wizard/dp/B003MTTJOY/ref=sr_1_1?ie=UTF8&qid=1382304799&sr=8-1&keywords=raspberry+pi+wifi+adapter
- 32 gb SD card (probablynough for our purposes)
    - $20
    - 30gb can store about 5000 - 7500 normal length songs
    - http://www.amazon.com/SanDisk-Class-Flash-Memory-SDSDB-032G-AFFP/dp/B007JRB0RE/ref=sr_1_1?ie=UTF8&qid=1382304883&sr=8-1&keywords=sd+card
- hdmi cable (for development purposes)
    - $6
    - http://www.amazon.com/AmazonBasics-High-Speed-HDMI-Cable-Meters/dp/B003L1ZYYM/ref=sr_1_1?ie=UTF8&qid=1382311020&sr=8-1&keywords=hdmi+cable
- external hard drive (probably not needed)
    - price depends on size

Resources:

http://makezine.com/projects/raspberry-pi-radio-time-machine/
http://www.stuffaboutcode.com/2012/06/raspberry-pi-run-program-at-start-up.html