Mikhaela Dietch, Jonathan Jacobs,

Tehya Stockman, Rachel Yang

Software Design

24 March 2016

Project Proposal

THE BIG IDEA

Our main goal is understanding how to implement some visual representation of data collected through sensing. We want to use a raspberry pi (and possibly video) to sense interactions with a projected graphic. The graphic will be computer generated. The raspberry pi will collect audio. The 'Big Idea' is to visualize sound in an interactive way using a large-scale projected image. Our current concept for what the interaction might look like is something like this:
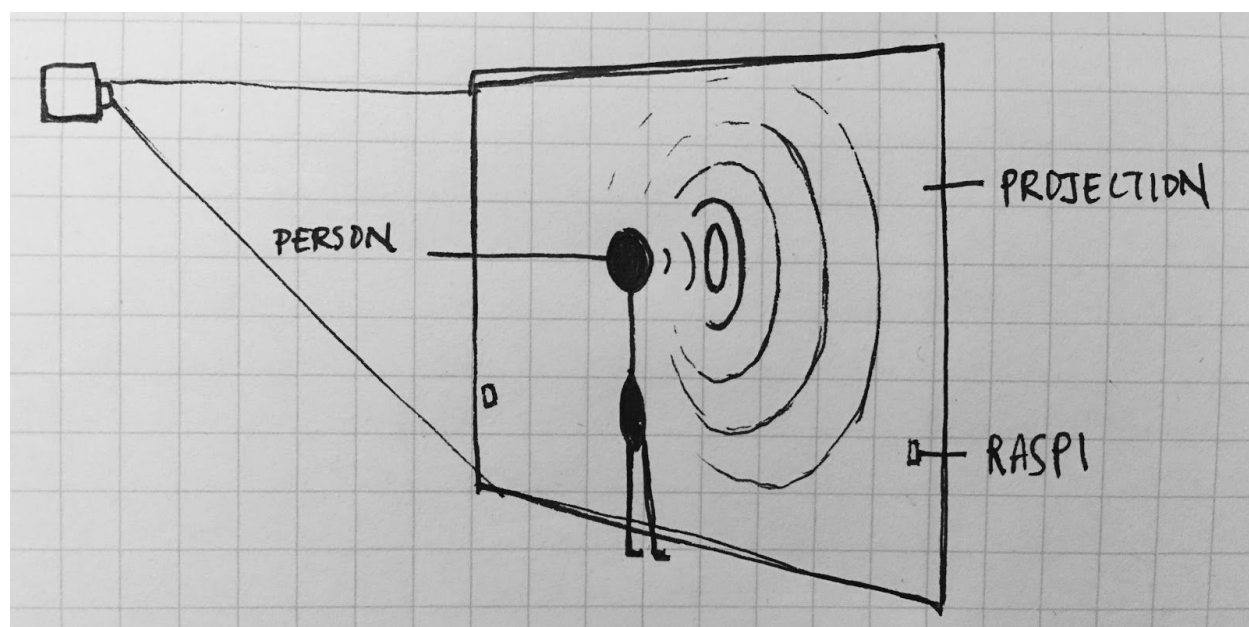
The *minimum viable product* will be simply using audio to determine a single person's location with the raspberry pi.

Our *stretch goal* will be to collect data from video as well and incorporate it with the audio to make more complicated and interesting graphics and interactions with the user. We would also like it to be interactive with multiple users.

LEARNING GOALS

Mikhaela	I want to get more practice at realizing a conceptual design in computer generated graphics. And I would like to learn more about using hardware to collect usable data.
Jonathan	I want to gain experience using sensing instrumentation, as well as learning how to use the raspberry pi in conjunction with a normal computer.
Tehya	I want to learn how to use a raspberry pi to collect data from our sensors, increase my confidence with python, and learn more about computer generated art and graphics.
Rachel	I want to learn how to use audio to locate where a sound is coming from, and I am super interested in human interaction with software. I also want to improve my skills with graphic design and aesthetically pleasing visuals.

IMPLEMENTATION PLANS

We will be using raspberry pi as a way to collect data in real time and interpret the data in a (¡really fucking cool!) projected visual representation. For problems that arise in implementing our project, we will look things up online, consult each other, and go for the ninjas/professors for more help.

PROJECT SCHEDULE

By the end of...

Week one: Have a raspberry pi communicating with a computer.

Week two: Be able to decipher distances from the audio data received by the raspberry pi, and have some sort of basic graphical representation of that data.

Week three: Real-time graphical representation of where a sound is coming from

Week four: More complex graphics based on volume.

Week five: incorporate video into our graphical representation

Week six: Incorporate multiple users and polish rough edges

COLLABORATION PLAN

We will create and update a UML diagram each week to serve as a general outline and ensure we are all on the same page. We plan on doing a mix of working

independently and integrating often, as well as pair programming. Our goal is that each member fully understands each part of the code and is able to explain its importance.

RISKS

One risk we have to keep in mind is if we can't get the hardware that we need in a timely fashion--the raspberry pi, the microphones, the projector, etc. Assuming we can, considering that none of us have any experience working with a raspberry pi, it may be challenging to get the hardware communicating with the computer. Also, it could be difficult to operate all of our programs in real-time. Lastly, we'll have to choose the correct environment so that we won't have to worry about filtering out any unnecessary noises.

ADDITIONAL COURSE CONTENT

We would like to learn how to collect and process data in real time.