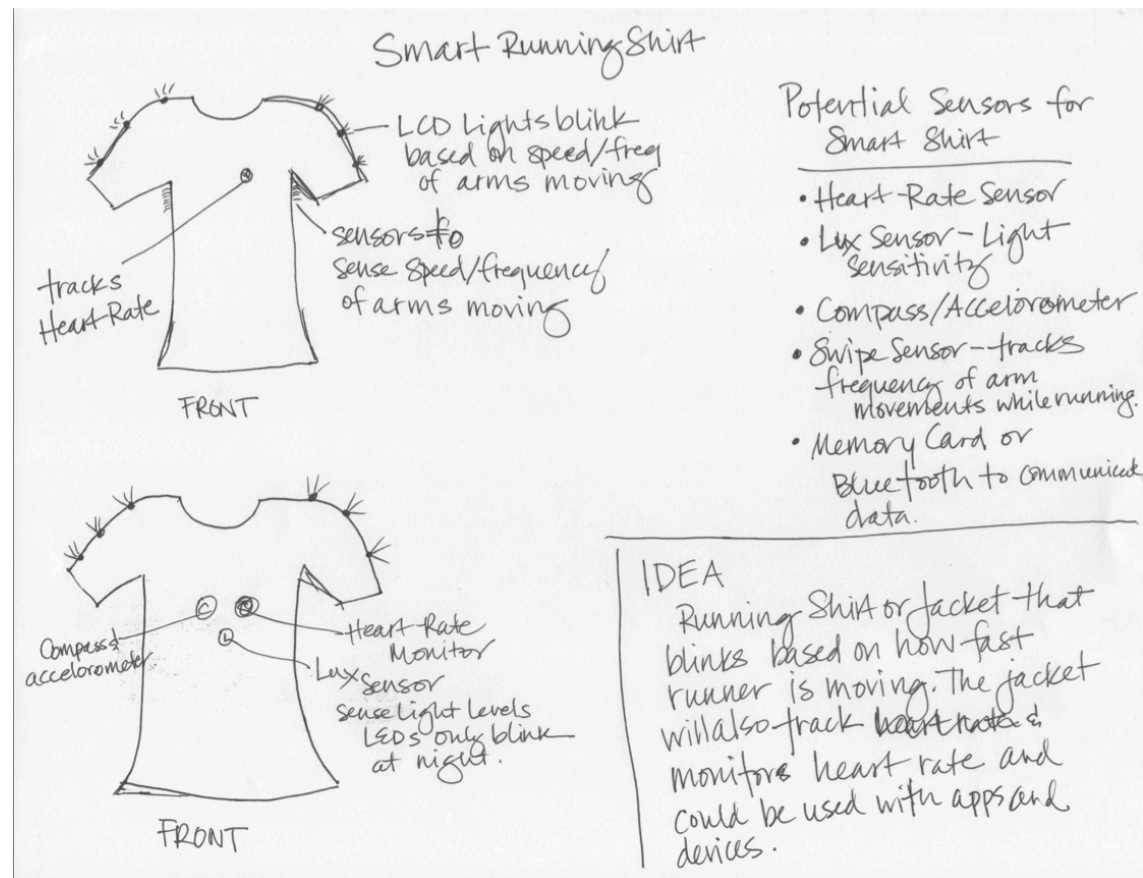# Physical Computing | Final Project Proposal
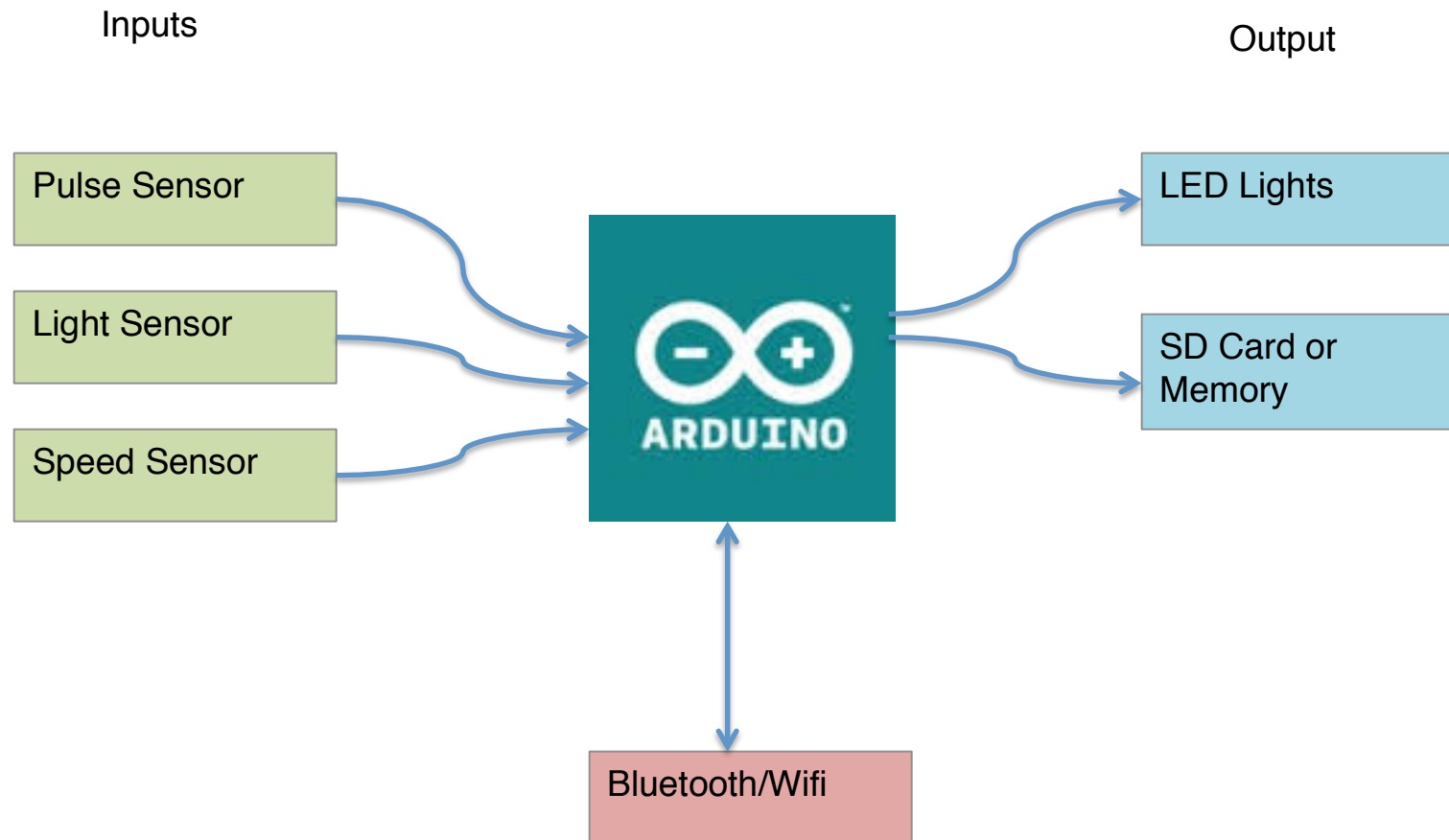
Gail Thynes

Idea I Smarty Shirts

A smart shirt that monitors your heart rate and blinks based on how fast you are running and the time of the day. This could eventually be expanded on to include GPS tracking, connect to a music headset, and provide voice commands for performance and sync with fitness applications.

Idea I Description

Applying the principle of the Internet of Things, the smart shirt will eliminate the need for additional devices to track fitness performance. The smarty shirts prototype will use an Arduino Uno board, several sensors, and LED lights in its first phase of development. Using a pulse sensor, the shirt will track the users heart rate and record or share the data. Using a light sensor the shirt will track the time of day, if it's in the evening when the light is lower, the shirt will blink based on speed of activity (walking or running) as a safety precaution to vehicles in the read. The faster the user is moving, the faster the lights will blink. Ideally runners or anyone who does outdoor activities and would like to track their performance would use this product.

System I Diagram

Inputs

Output

Pulse Sensor

Light Sensor

Speed Sensor

LED Lights

SD Card or
Memory

Bluetooth/Wifi

System 1 Components

- 1 Arduino Uno

- 1 Pulse Sensor (http://www.adafruit.com/products/1093)

- 1 Luminosity Sensor (http://www.adafruit.com/products/439)

- 1 speed sensor (could use several different approaches that need more research)

- 1 Bluetooth connector (http://www.adafruit.com/products/1697)

- 1 micro SD card (http://www.adafruit.com/products/254)

- 10 LED sequins (http://www.adafruit.com/products/1758)

- Power Supply such as battery

- 1 shirt or jacket to add components to

- 1 band to attach pulse sensor to the body

- Various wires, adaptors, buttons, resistors, etc.

System l Challenges

The primary challenge for me is that this is my first time designing a project with arduino. I have little to no experience with physical computing. This project seems simple enough, however I have no experience with the pulse sensor, luminosity sensor, or Bluetooth technology. I imagine programming the lights to blink will be the easiest piece, but figuring out how to calculate the speed may be the most challenging part of this assignment. I have considered using directional textile sensor, but I may have to build one from scratch or do more research to find a viable sensor, this could render this feature of the project not viable by the end of the class. I think something that tracks the friction of the arm rubbing against the body may be the best way to track the speed of the user, but I will continue looking into this.