M5 Social Distancing Device

by harrison coutee for CSMA 112

Plans

Using the m5stick's thermal sensor, I will measure temperature and use the blobs to figure out how close a person is. When a person gets a certain distance away from the m5stick (6ft for example) the m5stick will emit a very annoyingly high frequency based on the proximity of the person. When that person gets way too close (1/2 a meter), the m5stick will emit an alarm sound and flash on the screen.

Another capability I want this program to have is to detect how much distance there is from the device and the human using temperature. Since the average healthy human temperature is 98.2 F, I think there's a way I can detect the range based on the temperature. Also, if the human's temperature is higher than the norm, I can have an alert on the device for that too.

Update 1

For some reason there's no real difference in temperature between me and my room. I'm not sure why but I'm trying to figure it out.

Update 2

I've decided to make a calibration setup screen at the beginning of the program where the user has to point the sensor away from themselves in order to get the average temp in the room.

Update 3

I've implemented a new calibration screen, a cool splash screen, and I've refined the blob detection a little. For some reason, I can't get my own images to draw on the screen, so hopefully I can fix that today. I've also modified the

script to only display humans (blobs) in the camera view. I'm not sure yet what I'll do for an enclosure for the device.

Update 4

I'm going to connect this script to adafruit.io to track the amount of people the person wearing this has passed. For example, if someone wearing this device goes on their morning jog, they can come back and check how many times they could have been potentially exposed to COVID.

Update 5

I've decided to make the display horizontally oriented, so it can be used like a watch. It will display a progress bar that reflects the range between the wearer and another person walking by. It will also show the number of people the wearer has encountered. I'll also try to use the embedded gyroscope in order to detect if the wearer is looking at the watch. After this I'll clean up the code, deleting what I'm not using to save space.

Update 6

I've implemented almost everything I need, now I just need to find some bugs and fix them. The human detector is a bit sensitive, so I will fix that. I also need to find a way to make the thermal sensor stick to the front of the M5Stick.

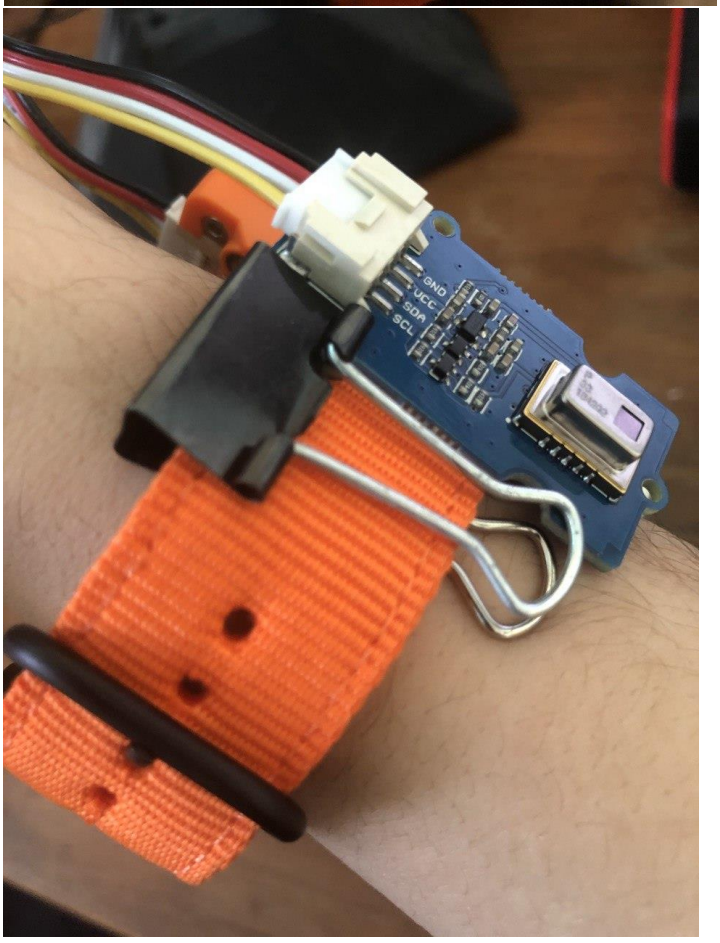
Update 7

I'm finished! Everything seems to be working fine. I used a clip to secure the thermal sensor to the M5stick wrist strap, so now it's pretty sturdy. I've made sure that the clip doesn't touch any of ther My adafruit.io connection works, and it's pretty accurate if calibrated correctly. I wish it would be more reliable, but I think that would require a thermal sensor with a better resolution. I also made a website on my GitHub pages for this project.

https://hc20k.github.io/m5sdd

Below are some photos, including a photo of my Adafruit.io feed from when I walked around my house with the device on my wrist.


people detected!
UNSAFE!
2 people encounte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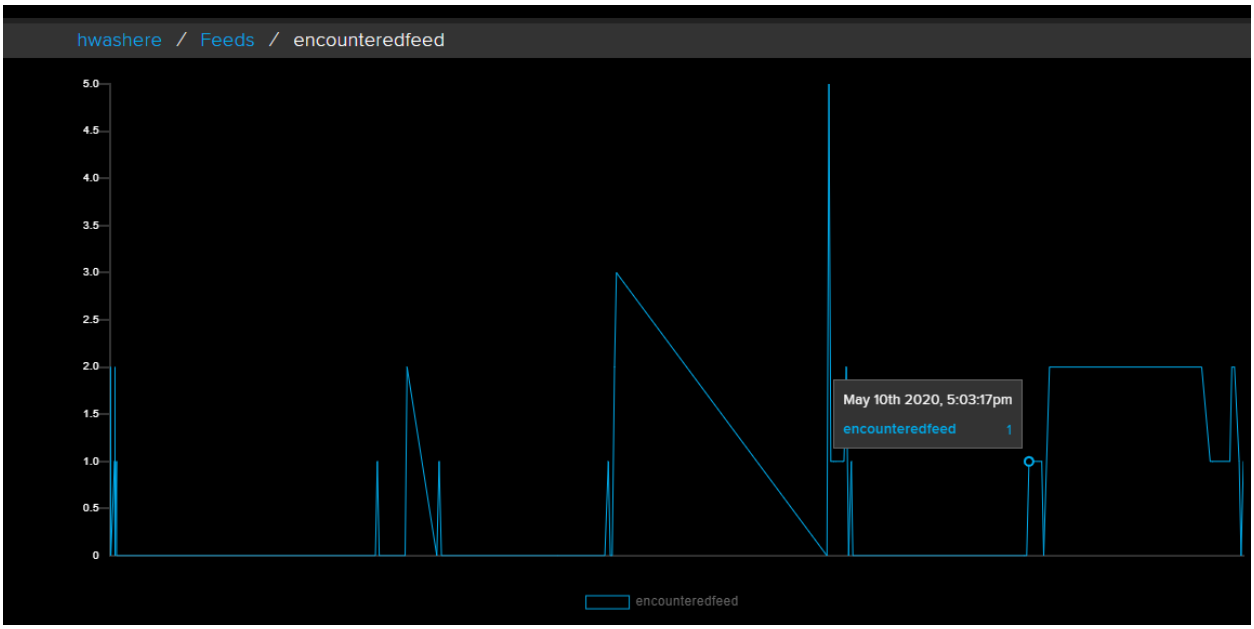
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