

Wearables Project

Wyeth Michaelson, Drew Willis, Breann Baker

12/8/2021

Project Report

Video Link:

https://www.youtube.com/watch?v=0VG9Vv_gw3I&ab_channel=WyethMichaelson

Overall, our project mostly does what we initially set out for it to do, just not in the ways we predicted. The emg sensors read in muscle data, it is classified, and a response is triggered to alert for help. However there are several things that, given more time and resources, we would optimize to make this product better.

At the moment, while the device is technically portable and contained, it isn't very small or lightweight. This is mainly due to our current resources. The main components are a Raspberry Pi, an Arduino Uno, and a battery contained in an armband. Between these devices are unnecessarily long and bulky wires. If we were to solder down all the smaller wires and purchase smaller USB cables, this would take down much of the weight. Reducing the size would also allow us to make better casing and increase the durability. We might also opt for a smaller battery as ours is fairly large.

One more significant issue that increases complexity and weight is that we are using both a Raspberry Pi and an Arduino. We chose to use a Raspberry Pi for its Python capabilities and interface, but unfortunately it has no analog input pin. We could use an extra component to convert the analog signal, but instead we chose to use the Arduino that we already possessed to interpret the signal and send it to the Pi. Another approach could be to use just the Arduino and find a way to convert our code to C++ and lose the Python libraries.

Moreover, our alert system could be improved significantly. Currently it consists of a small speaker located inside the arm band which can only play an alarm sound at a low volume. Given more time, we could create or connect an already existing alert system (such as Life Alert) to the product that could instantaneously contact a medical

professional or caregiver by sending out a radio signal through your phone line and to a monitoring system.

Lastly, to make this more of a product we would definitely need to test it on more people in different situations as it has been given fairly consistent and normal data. We could then tweak the settings in the code to adapt to these situations.