

Overall Project:

a. Why?

Help those who may have lost a hand/arm both mentally and physically. This will allow for amputees to complete arm and hand movements through EEG/EMG signals.

b. What exists; how done?

Other prosthetics exist in the world and many require a steep learning curve. The type of hand and arm being designed allows for the user to make arm and hand movements based off their own EEG/EMG signals. These are usually designed with servos to control each joint. These servos are controlled by the output of a microcontroller. The output of the microcontroller is based off the input to it which is an EEG/EMG signal recorded through an electrode.

c. What your project brings:

This project will allow for amputees to be able to easily pick up and use the prosthetic hand and arm.

Processor:

a. Why?

The RaspberryPi microcontroller will be used due to the amount of servos that have to be controlled.

b. External components vs. internal capabilities:

In order to operate the arm with the servos, two additional servo shields are needed. Additionally, circuitry such as signal amplifiers and external power sources are needed to power all the servos.

c. Speed cushion/improvement possibilities – project life cycle:

After completing a signal database for arm and hand movement, other limb movement databases can be constructed. These databases then could be used to control another prosthetic limb.

d. Cost consideration:

For this project there is no extreme cost considerations due to all of the supplies being readily available. The only purchase needed are the servo shields.

Hardware:

a. Availability:

The prosthetic arm and hand were already constructed. Therefore, everything is readily available minus the RaspberryPi servo shields.

b. Reliability:

I was informed that this project was somewhat completed in the past and it was reliable equipment.

c. Speed cushion/improvement possibilities – project life cycle:

The arm and hand design are in the beginning stages. The next improvements would be designing a lifelike arm and hand.