



Range of Motion

The Myoelectric Prosthetic offers a greater range of motion than other forms of prosthetics.



The prosthetic arm has five servo motors in the forearm compartment that control each finger. There is also a servo in the below the wrist which controls the wrist.

Affordability

The biggest goal of the project is to make myoelectric prosthetic arms available to a larger group of people.

Prices of Prosthetic Arms

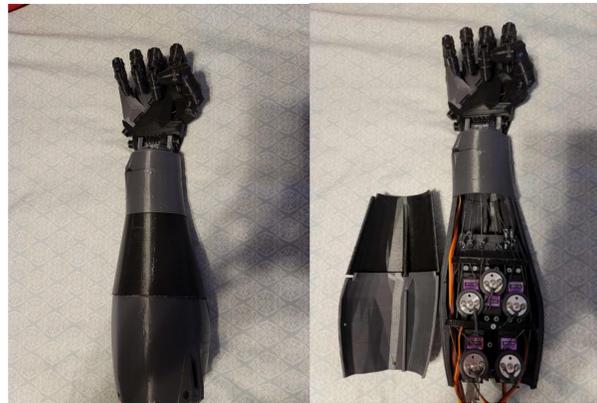
Myoelectric	\$20,000+
-body powered	\$10,000
-cosmetic	\$5,000

Our Costs to Build This Prototype

-Filament	\$40
-Arduino	\$20
-Muscle sensor kit	\$95
-Servo motors	\$35
-Fishing line	\$20
-Screw and Glue	\$5
-TOTAL	\$215

The Bionic Hand

Our Bionic Hand is a 3-D printed myoelectric prosthetic arm for below the elbow amputees. The arm is controlled by attaching EMG electrodes to the residual limb allowing the patient to control the arm using their muscles. The electrodes take the signal and send it to our microcontroller which then tells the servos what to do.



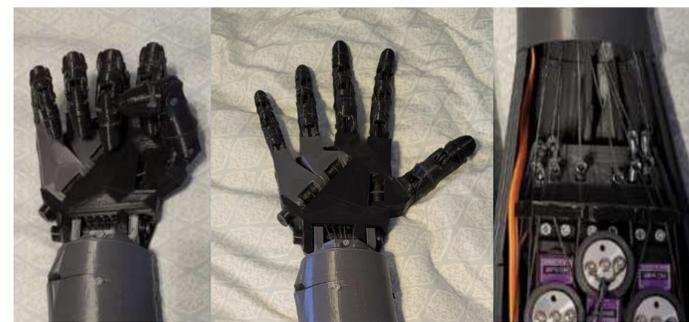
Servos

The myoelectric arm contains 6 servo motors. There are 5 in the forearm which control the fingers and one in the wrist to rotate the hand.



Finger Control

The servos in the forearm that control the fingers are connected by fishing line. We had to use braided fishing because braided line does not stretch. The line is running up the arm all the way to the fingertips.



Demo Video



This is a quick demonstration video of our bionic hand moving each finger individually.

Future Work

Doing this project during a pandemic gave us some unique problems. Such as, having to work separately from each other, and it made finding parts rather difficult too. We could not accomplish all we want, but we have a few ideas for future works.

- Work on our coding to create better functionality in our prosthetic.
- Upgrade the arm to a more durable but still cost-efficient building material.
- Work on the arms appearance to make it look more natural.