Control of Robotic Systems using sEMG Signals

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Objectives

- Use MATLAB to collect and stream data from the MYO armband
- Create an Artificial Neural Network (ANN) in MATLAB to train and classify the data
- Send classified gesture output to an Arduino
- Build a functional robotic hand
- Successfully operate the hand with Arduino
- Provide a friendly user interface for the entire process:
  - Data Collection
  - Training the ANN
  - Real-time data streaming

Project Design

- The purpose of this project is to build a robotic hand that performs many tasks with a high similarity to that of the human hand
- A prosthetic hand that is nimble, quick, strong, lightweight, quiet, and efficient is the objective for this experiment.
- The designs in the photos is similar to the design of our project.
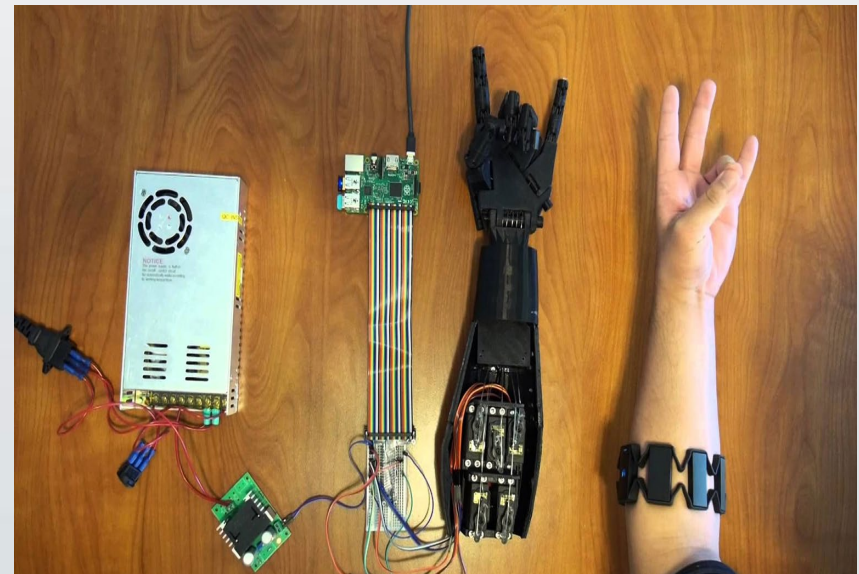
Reasoning: *A cost-efficient option for limb replacement.*

- Circulation issues resulting from atherosclerosis or diabetes. These diseases could possibly lead to amputation.
- Traumatic injuries (traffic accidents,military combat)
- Cancer
- Birth defects

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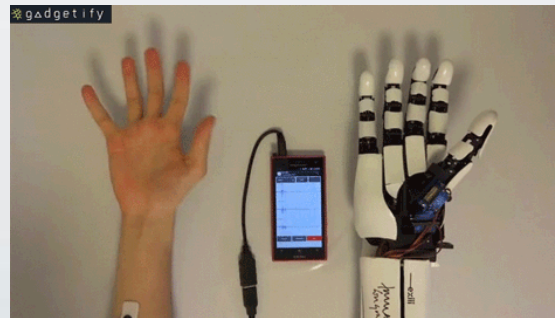# Materials

- Computer with MATLAB

- Myo Armband

- LattePanda Alpha or Arduino Mega

- Robotic Hand

Conclusion

Through this project we hope to explore the different cost effective options for prosthetics. As well as how that cost effective option could be implemented or deployed to the consumer market.