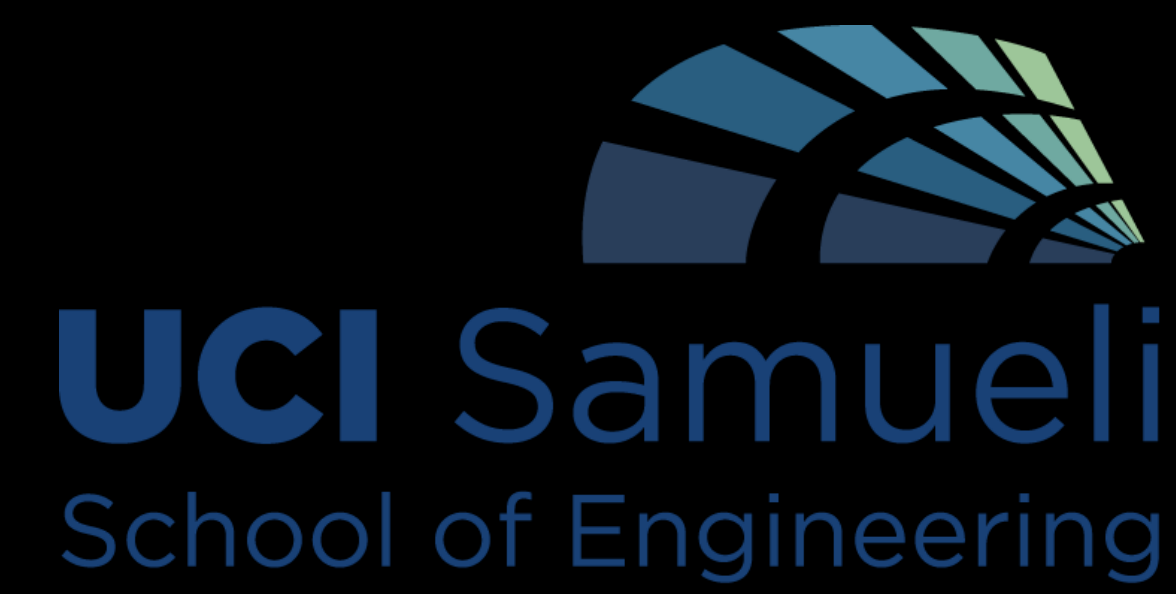


www.krobotech.com

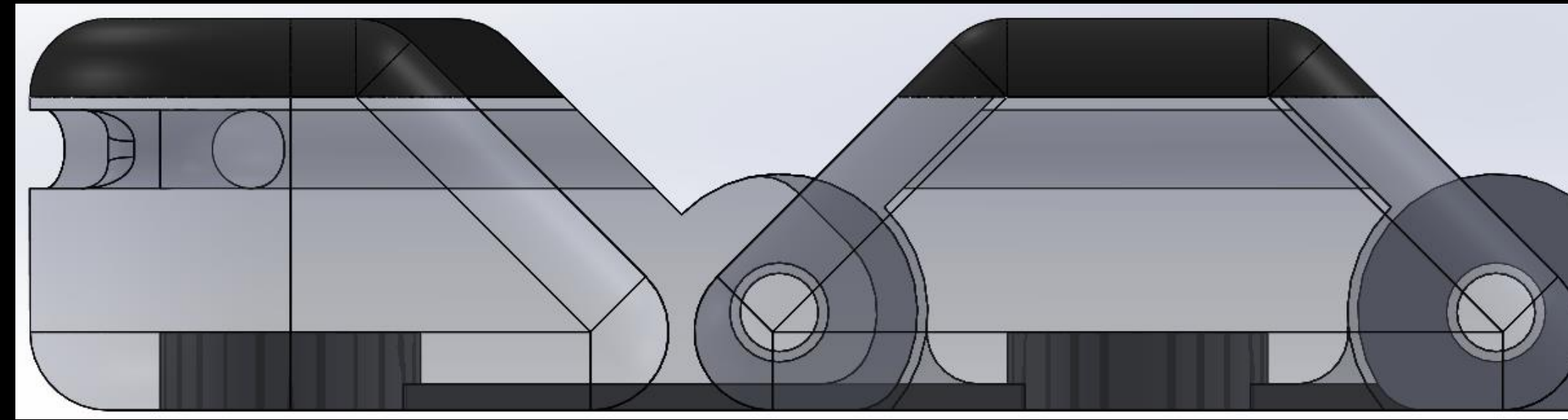
# Krobohand

## A 3D Printed, Robotic Prosthetic Hand



### Background

Krobotech recognized a significant gap in the upper limb prosthetic industry between cost and functionality of a prosthetic, leading them to create Krobohand.



Joint Detail  
- Side profile showing flexible tendon, grips, and core.

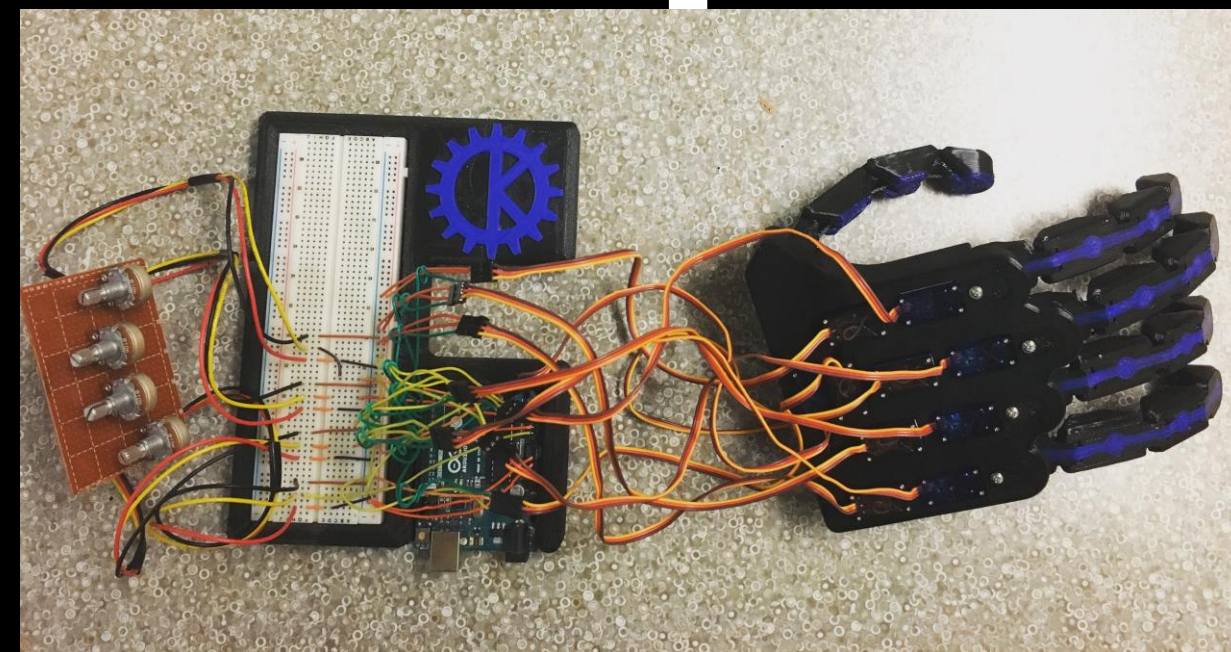
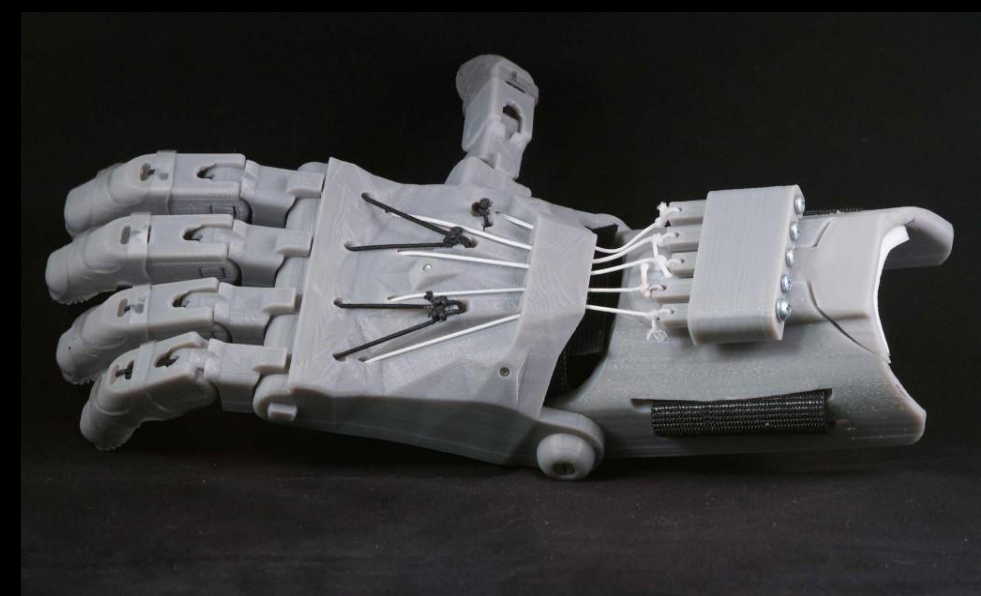
### Design

Krobohand is both cost effective, as well as functionally viable. Fabrication techniques, as well as unique designs yield an innovative upper limb prosthetic.

Raptor Hand - \$50

Krobohand - ~\$2,500

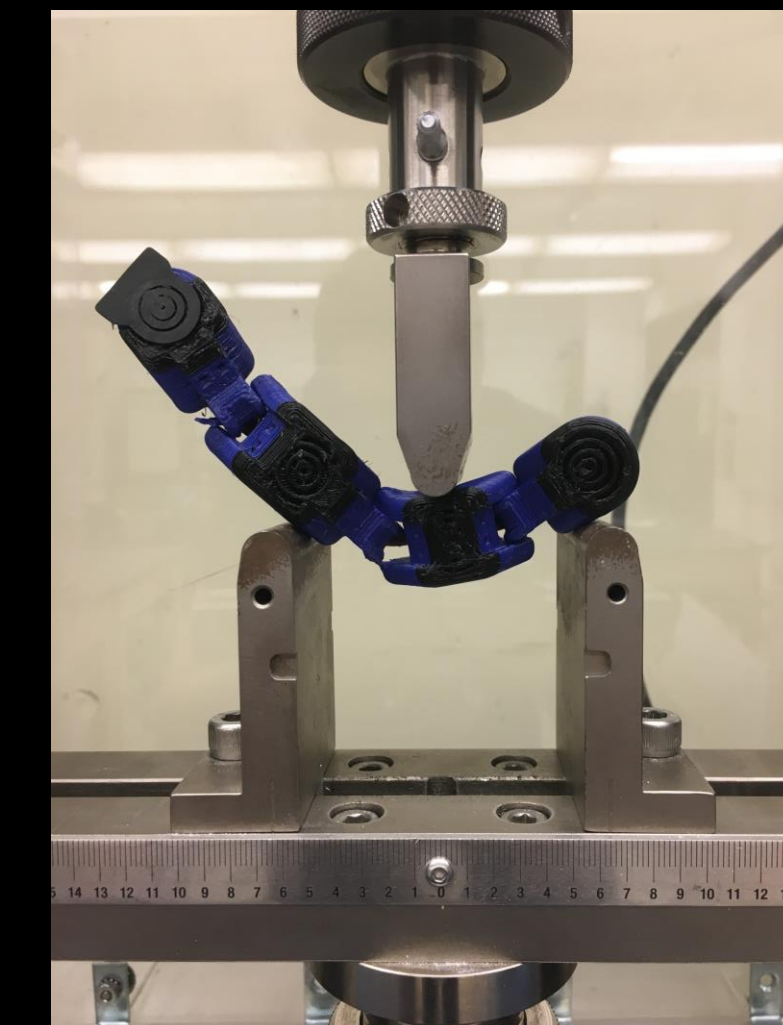
Split Hook - \$10,000



Tensile Test



3-Point Flexural Test

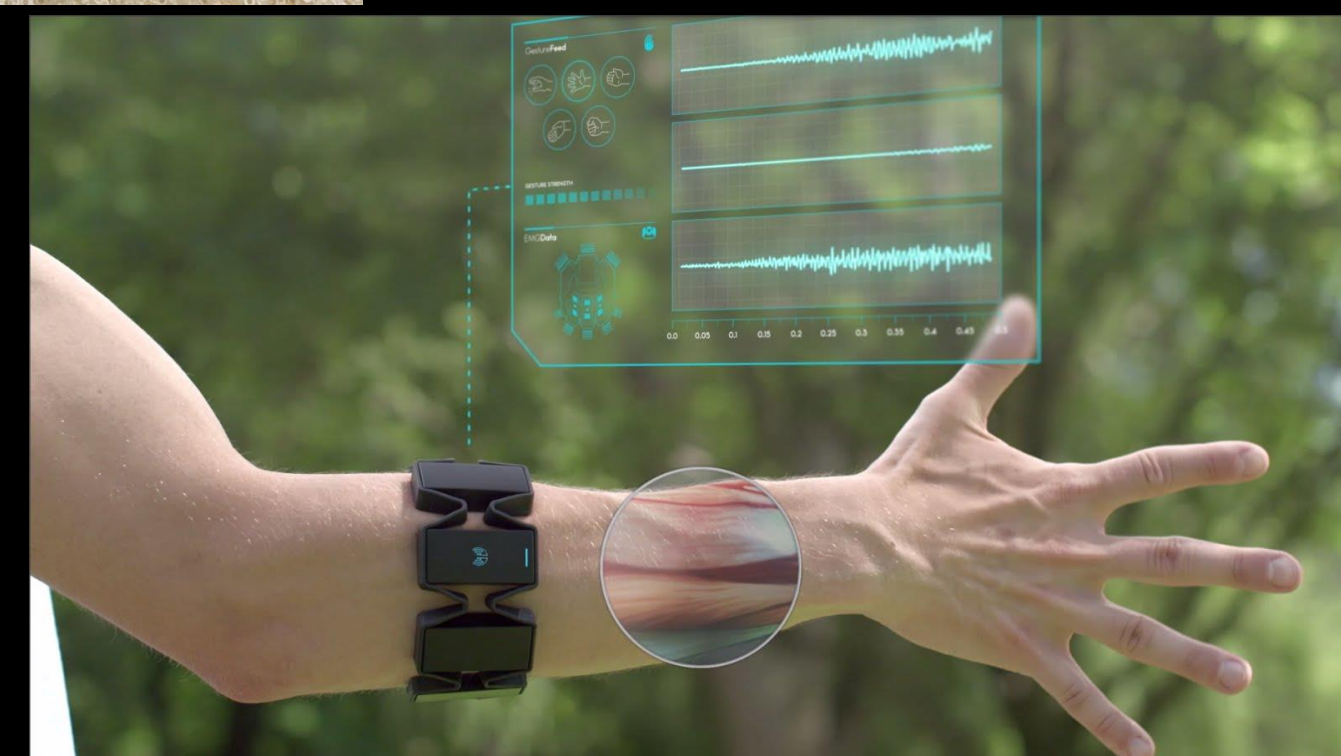


### Innovation

- 1.) Fully 3D Printed Joints, Lateral Joints.
- 2.) Flexible tendon as a stabilizing, restoring force, like the extensor tendon of a human.
- 3.) Grip on palm side printed from same material as the flexible tendon, finger pads.
- 4.) Electromyography for connection between prosthesis and amputee, to be non-invasive.

### Goal

Bridge the gap in the upper limb prosthesis industry between cost and functionality.



### Electromyography

- 1.) Myo Armband on existing muscle groups of amputee.
- 2.) Signal interpreted by Arduino Uno 101 via Bluetooth, actuates servo motors.

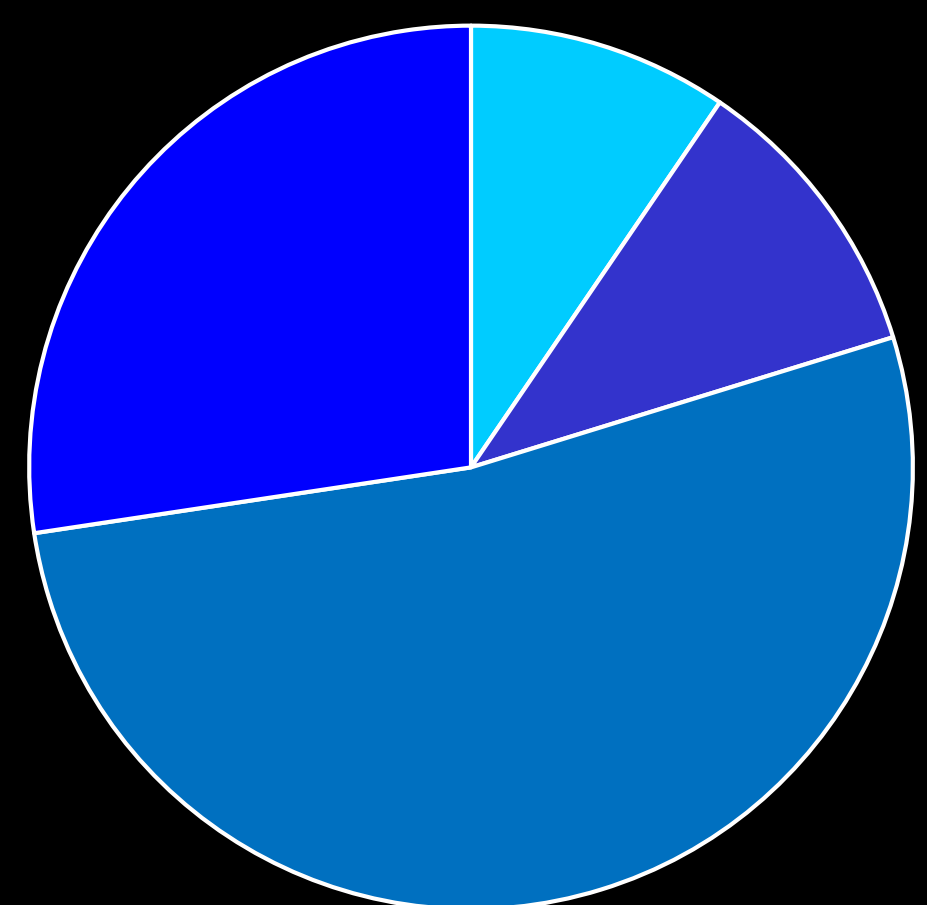
### Structural Testing

- 1.) Tensile Test – Avg. F before failure: 0.38kN or 85 lbf., 31.75mm (1.25in.) ext.
- 2.) 3-Point Flexural Test – Avg. F before failure: 0.83kN or ~180 lbf.

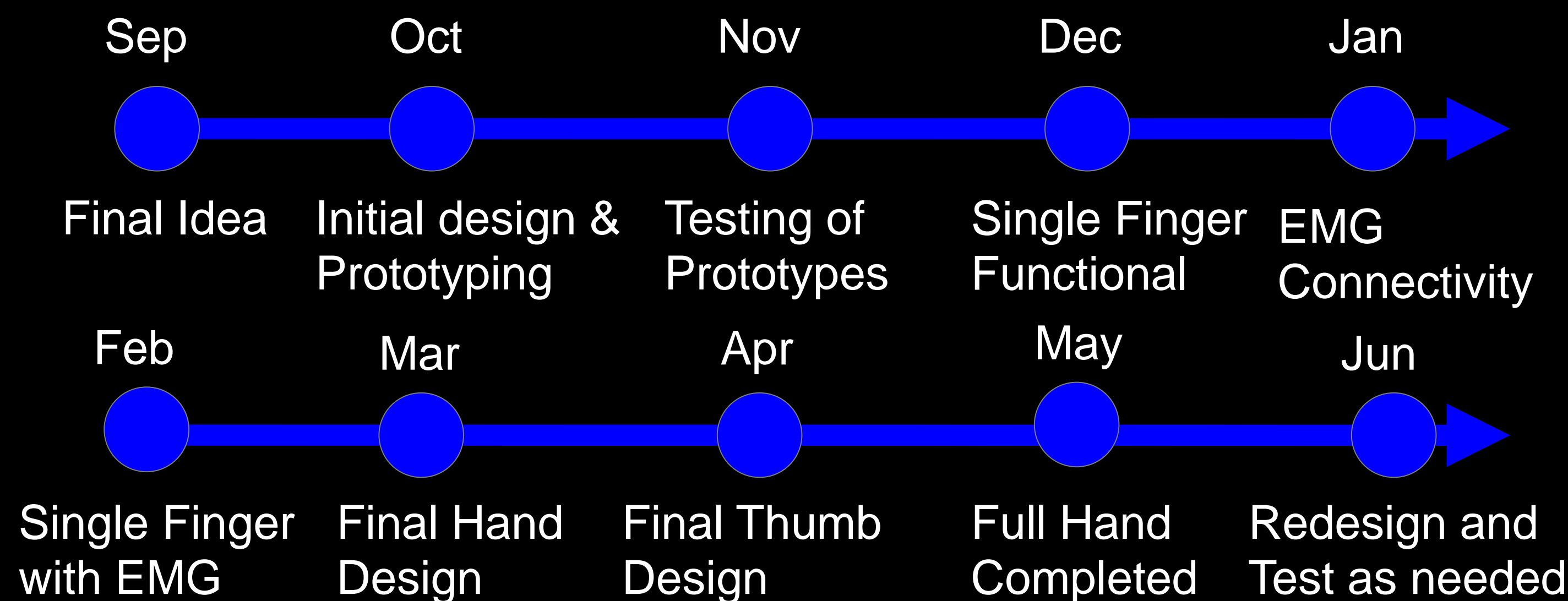
### Objectives

- 1.) Fabrication with dual material 3D Printing.
- 2.) Streamline process of connectivity between electromyographic sensors and amputee.
- 3.) Create a sleek, clean, and recognizable upper limb prosthesis.

Total Cost: < \$500



### Timeline: 2016-2017



### The Team

L to R: Ethan Kirkley, Kevin Wong, Cameron Hunt  
- Advisor: Dr. Reinkensmeyer