



**CALIFORNIA SCIENCE & ENGINEERING FAIR  
2018 PROJECT SUMMARY**

<b>Name(s)</b> Matthew Fogel	<b>Project Number</b>  38810
<b>Project Title</b> 3D Printing and Programming an Affordable Prosthetic Arm	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> The purpose of this project is to create a prosthetic arm that is affordable, easy to control, and easy for anybody to make themselves. The design constraints were for it to be under \$100, able to fit the electrical parts inside, and similar to the shape of a real arm.</p> <p><b>Methods/Materials</b> I designed a forearm on Autodesk 123D in addition to using a pre-designed 3D model of a hand. I 3D printed the parts and wired the electrical components to an Arduino. I wrote a program using a version of C++ to close each finger when a button is pressed.</p> <p><b>Results</b> The prosthetic arm met the design constraints. It was able to successfully grab and hold a 12 oz water bottle, or about 3 quarters of a pound. The total cost of the materials used was about \$65.</p> <p><b>Conclusions/Discussion</b> This arm is an affordable alternative to currently available prosthetics.</p>	
<b>Summary Statement</b> This project focuses on creating a prosthetic arm that is affordable, easy to control, and easy for anybody to make themselves.	
<b>Help Received</b> Used 3D printer at Loma Linda University Medical Center under the supervision of Michael Davidson, MPH, CPO	