



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

<b>Name(s)</b> <b>Tharushi Jayasinghe; Fiona Wee Eng</b>	<b>Project Number</b> <b>J0320</b>
<b>Project Title</b> <b>Automaton Arm Prototyping</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> Through the creation of each arm prototype, we aim to increase functionality to offer the best product we can. Whether to cater to individuals with disabilities, or just those who want a way to ease the stresses of life, with our arms we want to be able to fit the needs of all. As arms are created to offer solutions to more and more everyday problems, some aspects that will likely see improvement are joint strength, general material strength, portability, and versatility.</p> <p><b>Methods/Materials</b> Cardboard, popsicle sticks, paper, a glue gun, Arduino circuit boards, breadboards, wires, servos, knobs, a computer/laptop, a 3D printer, and a 3D printer filament spool are needed to recreate the arms, as well as the IDE that comes with Arduino. With each prototype that we built, the number of servos plus quality of the materials used increased, as did the functionality, and code was tweaked.</p> <p><b>Results</b> With the addition of servos as we went along building more prototypes, our final product functioned somewhat as a human arm would and worked the best out of all the ones that were made. The other prototypes didn't perform as well. Functionality-wise, the first prototype didn't work to serve our purpose of assisting in the home. The second prototype mimicked shoulder, elbow and wrist movements and performed better than the first prototype but still had room for improvement.</p> <p><b>Conclusions/Discussion</b> From building the prototypes we learned how to wire/write the code for servos and knobs, while also building skills in problem solving, creativity, and teamwork. As each arm was built, it quickly became clear that by bringing them into the home, robotic arms could see uses pertaining to fields other than industrial, medical, or extraterrestrial. Some personal needs include moving objects in the attic or clearing the yard. Most people take those actions for granted, but there are those who aren't capable of doing these activities themselves. Even then, one with the capability to perform those tasks may face difficulties because of diseases like arthritis, something which the arms we built combat.</p>	
<b>Summary Statement</b> With our robotic arms, we aim to better the lives of those who both need and want it, keeping efficiency in mind with each version.	
<b>Help Received</b> My father, Edward Wee Eng, provided us with the resources we needed, including the 3D printer.	