Do You Need A Hand?: A Robotic Device Designed to Assist Physically Disabled People with Eating

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Millions of Americans suffer from physical disabilities that make performing day-to-day tasks a challenge. In order to meet the demand for assistive technologies during mealtime, I engineered a robotic arm with bluetooth capabilities in order to enable physically-disabled people to be as independent as possible when eating. I created all parts of my arm using a 3D printer and then manually assembled the parts. I used MIT App Inventor to build a bluetooth smartphone application and used Arduino Coding Application in order to program movements and functions of the robotic arm. In order to test the efficacy of the device, I ran 10 trials using 5 different foods to measure the success rate of my programmed device and its ability to transfer food. Once all of my tests were conducted, I found that my spoon/fork appendage had an overall 56% success rate while the claw appendage was only 28% successful. I found that my device was capable of transferring some foods better than others but ultimately could be improved in the future by adding more voltage to the device and improving the overall design of the robotic arm. I anticipate using what I learned this year to enhance the design and overall programming of the device for next year's Science Fair.

Awards Won: