Prosthetic Hand using Microcomputers and Sensors

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Engineering Objective

Create an affordable prosthetic hand to complete similar functions to a normal prosthetic hand

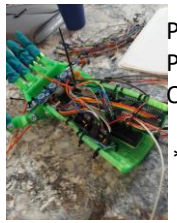
- Many prosthetics can easily cost over $5000, and that is just for cosmetic prosthetics.
- For functional prosthetics, due to how much functionality they have, they can cost anywhere between $20,000 and $100,000
- Many people struggle to afford items that are this expensive, especially those who have a disability because of this, I set out to create a prosthetic hand that is functional and affordable

Project Design

- With a design from Creighton University that was open to the public for educational, research and medical use, I was able to create a 3D prototype for the hand itself.
- Using some of the concept that I used in my last year's project, I created a system that would use motors to move string/line that would move the fingers
- By using many open source code and creating my own code, I used microcomputers and sensors to program the motors to move the fingers based off of certain sensors

Data Analysis and Results

Through much trial and error with the code, the sensors and the design, I set out to perform the following tasks. In the end, these were my observations.



Prototype of Hand
Photos Taken by Jeron Osguthorpe (me)

* = It was successful, but it did have some struggles with the task

Task	Result
Pick up Item	Successful
Hold Pencil	Struggled*
Shake Hand	Successful
Make a fist	Successful
Push Buttons	Successful
Point	Successful
Numbers	Struggled*
Gestures	Struggled*

Interpretation and Conclusions

- Overall, the hand cost for consumers around would be $105 to be created going up to $200 based off design, sensors, shipping and parts.
- With a hand of similar functionality, the cost would be around $24,500, which makes my project be around 0.429% of the cost.
- Overall, the hand was able to complete many of the same functions as other prosthetic while keeping the cost relatively affordable.
- In the end, some changes could be higher quality parts and lower profile parts which would only be a tad more expensive.