Wrist Exoskeleton

Robotic Rehabilitation – Release, Rehabilitation, Remobilization

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UCI Samueli School of Engineering

Background

With the frequency of stroke occurring is increasing, there is a higher need to provide a more efficient and effective rehabilitation method. There are already previous research done using robotic therapy on patients that suffer a stroke.

Goals and Objectives

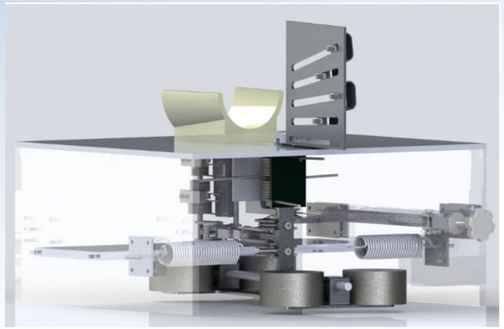
The goal of our project is to create a stand-alone wearable device using scaled down linkages to aid patient with movement in their daily lives. We are creating a wrist exoskeleton made with mostly 3D print and some metal parts. The main objective is to make a durable, strong, and light wrist exoskeleton so the patient can wear it freely.

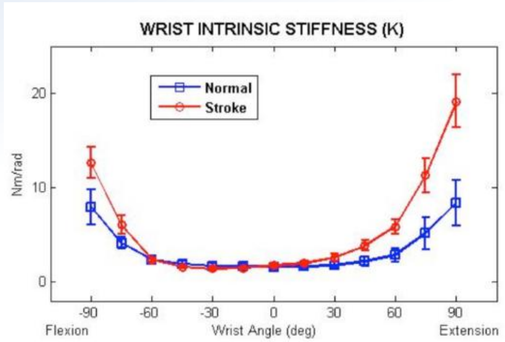
Project Timeline

Fall	Background Research	Applying UROP	Material Purchasing & Testing
Winter	Second Generation Prototype	Experiment Testing	Design Improvements with Alternative Methods
Spring	Testing with Stroke Patients	Finalizing Designs	Document

Previous Model & Study

A previous study done by a doctoral student at UCI, developed a mechanism called WRIST. The purpose of the machine is to use a combination of torsional, linear springs, and linkages to create resonance with the system to aid the patient in moving their wrist. When a system operates at resonant frequency, it amplifies the movement. Using this concept, WRIST allowed stroke patients to gain more mobility on their wrist.





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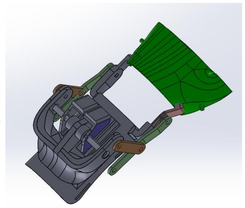
Current Progress

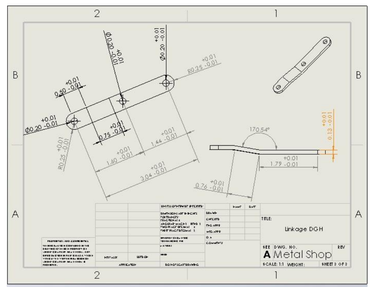
Initial Wrist Exo



CAD Improvement

Torsion Spring Purchase

Search Comfortable Pads to cover the wrist

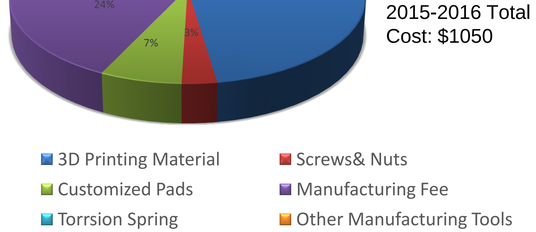


Manufacturing Linkages

Future Work

We already figure out the old prototype's weaknesses and have all the CAD files ready to be 3-D printed. Some components are adjusted to make sure the physical mechanism work perfectly. We are currently in the process of working with the manufacturer about 3-D materials, torsional springs, and paddings. In the winter, all components will be 3-D printed and tested to be a commercial product.

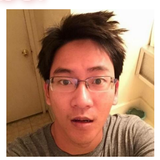
Budget



2015-2016 Total Cost: $1050

Team Member

Nathan Phung



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