

Touch Trainer

# Rehab Robotics- Touch Trainer

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## Background

The Center for Disease Control states that approximately 795,000 people suffer from a stroke each year thus making it the leading cause of long-term disability in the United States. When an individual suffers from a stroke, many lose somatosensation in one of their hands. This leads to a loss of the sense of touch (tactile sensation) and sense of movement of their limbs (proprioception). A patient's loss of motor function typically affects the entire hand from fingers to wrist and results in much slower and weaker muscles in the arm. Additionally, patients can suffer from spasticity, or stiff, tight muscles that keep the affected hand clenched tight.

## Problem and Solution

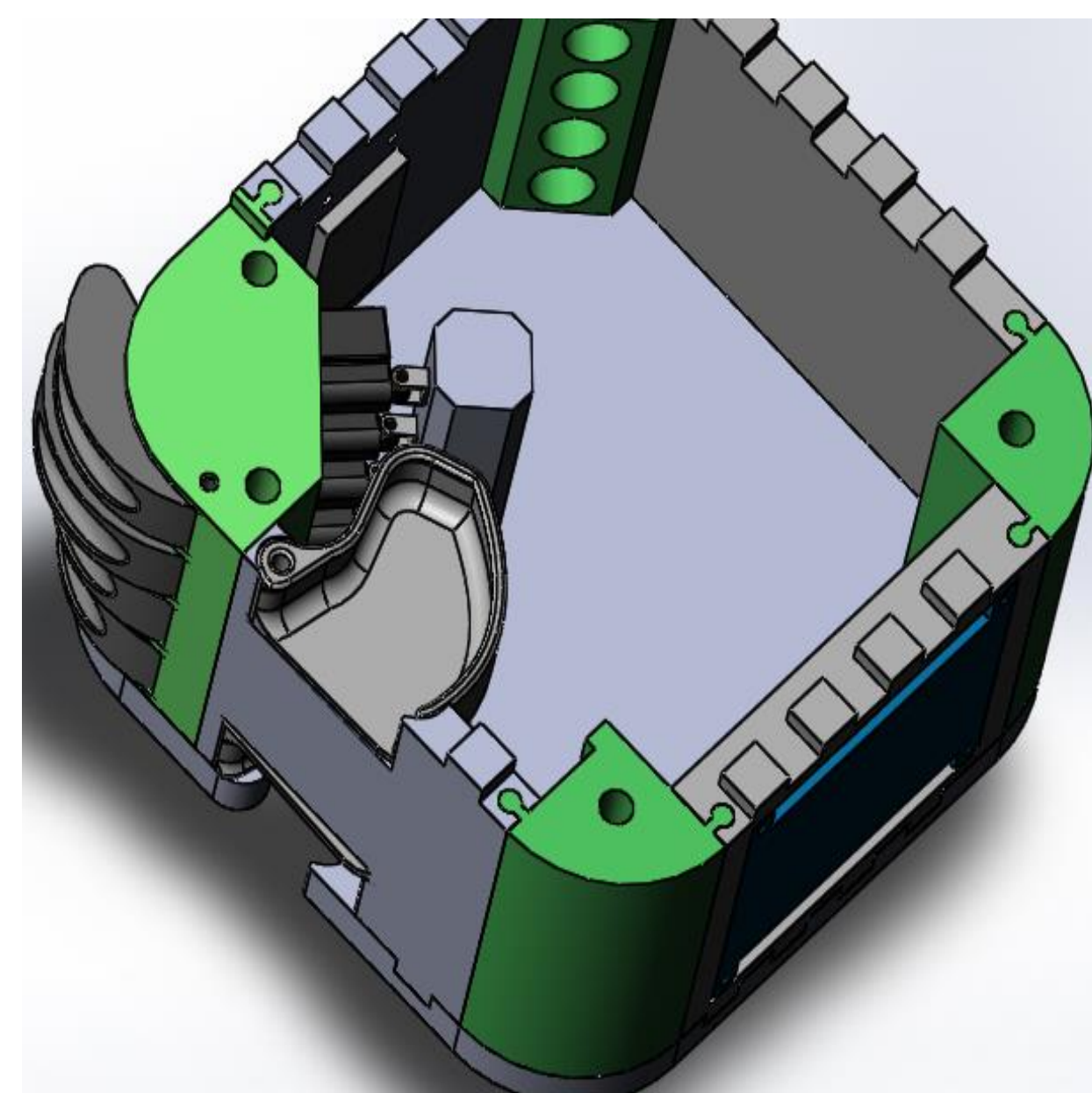
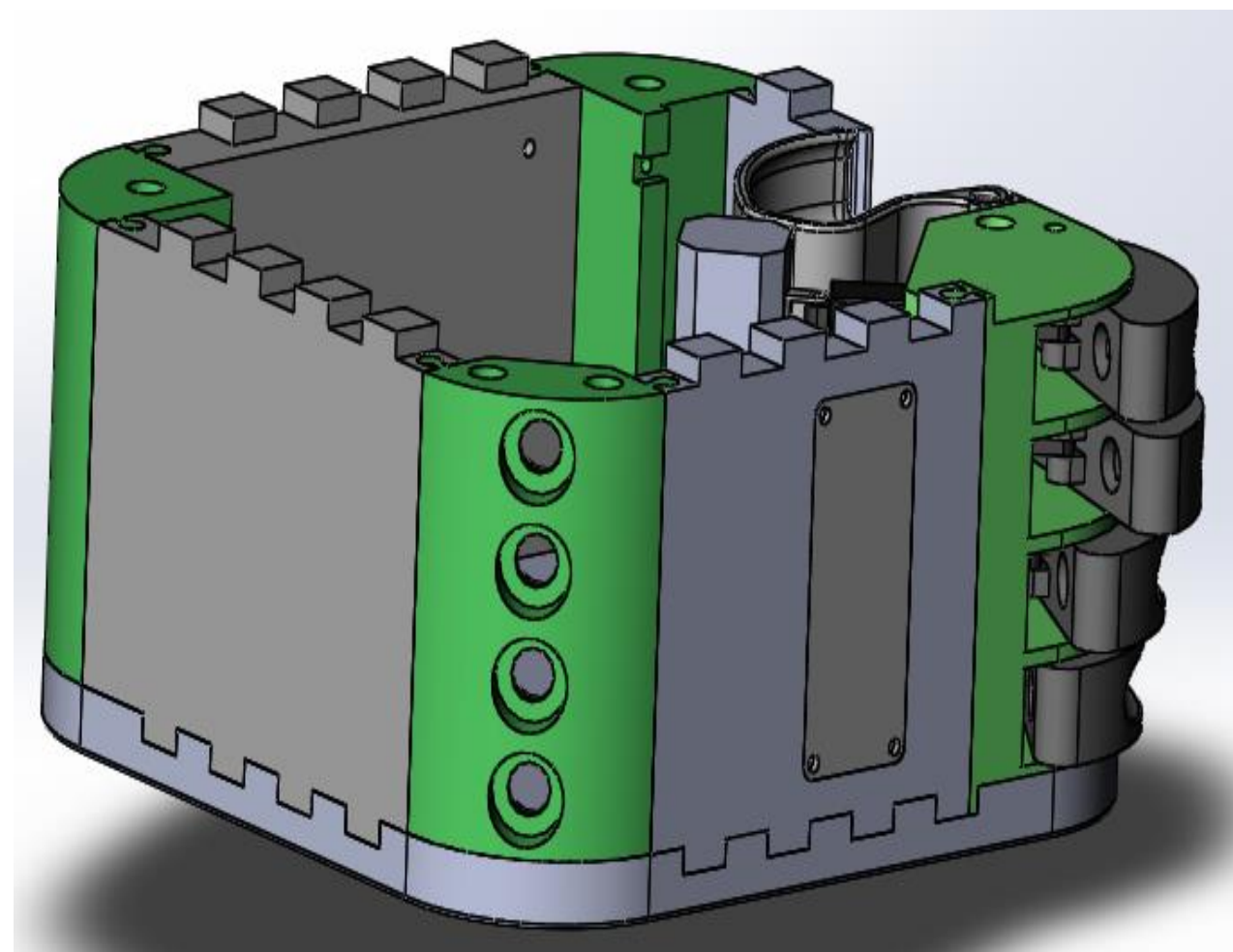
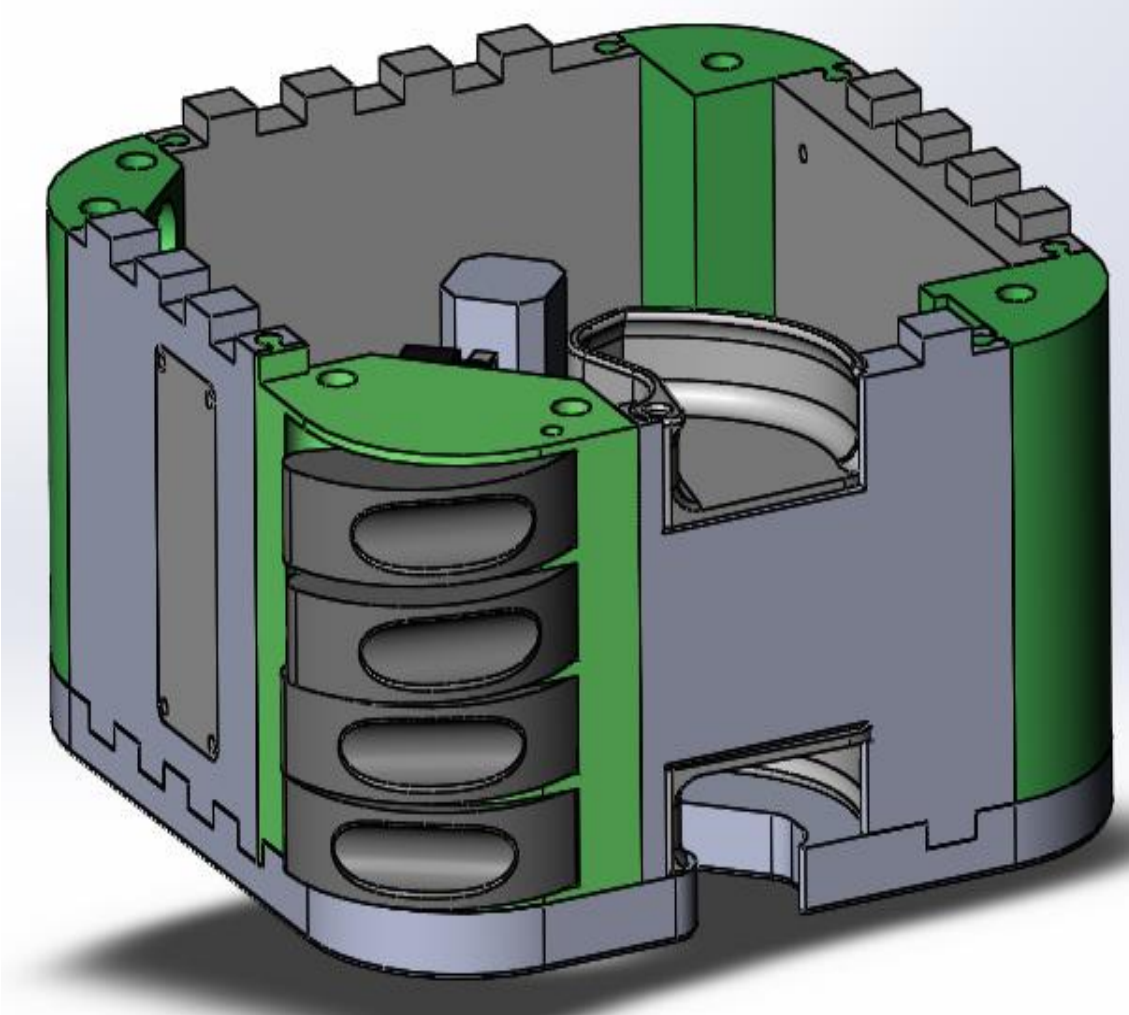
- Problem: Many rehabilitation facilities for stroke patients focus on assessments of movement and do not focus on the rehabilitation of somatosensation. This lack of focus is not beneficial to the patients and does not result in optimal recovery.
- Solution: Design a device that will focus on the rehabilitation of somatosensation in stroke patients while providing an affordable, portable, and convenient means for doing so.

## Innovation

- Our design forces the patient to focus on their sense of touch while using the device
- Actuators will aid to decrease spasticity and vibration motors will increase somatosensation
- Portable stroke rehabilitation- they do not have to rely on accessibility to a facility

## Goals and Objectives

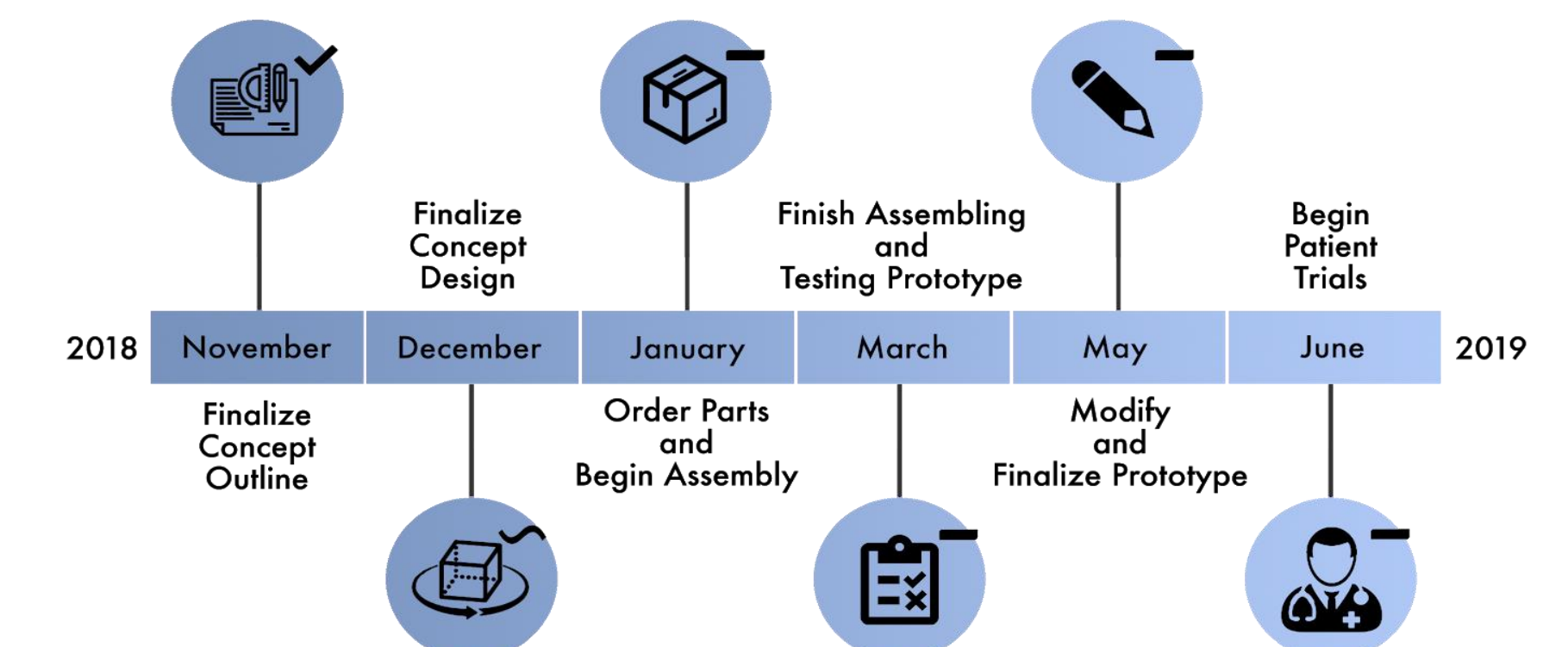
- Improve sensation in impaired hand of stroke patients after 6 months of using the cube
- Manufacture a cube at maximum size of 10" x 12" x 18" that is battery operated
- Have session lengths increase until the user can play a full song
- Have fully developed pseudocode by November
- Use Solidworks and ANSYS for stress analysis
- Determine amount of force applied by hand



## The Bigger Picture

- There is no portable somatosensation rehabilitation device available on the market for stroke patients
- This is the first of its kind and will become more beneficial over the 5 year developmental stage
- The cube will record data to make new breakthroughs in stroke rehabilitation
- If beneficial, it could help people worldwide

## Timeline



## Overview

9 months ago, our team was given a problem statement. During that time we have successfully created, designed, and manufactured our concept. Additionally, we have designed and coded the game.

## Next Steps

- Next year's team will test and continue to develop our device
- Patient trials will be conducted to test the validity of our design concept in rehabilitating somatosensation loss
- This will be a five year project

## Contact Information

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