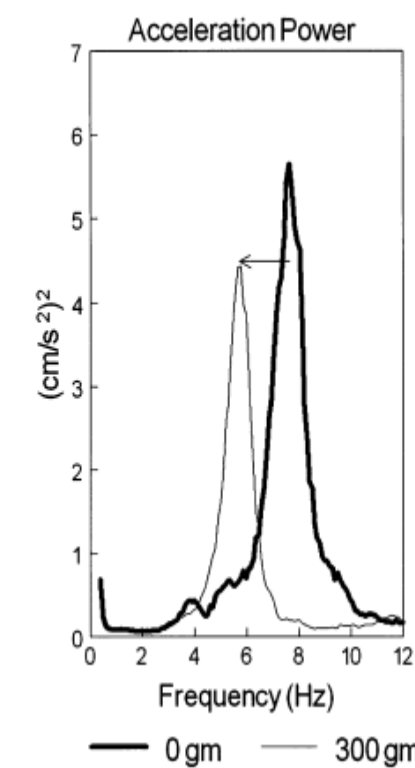# Hand Use Monitoring Device

Background:

A stroke is when blood stops flowing to certain areas of the brain. When the brain is deprived of blood, it loses oxygen and the cells starts dying. Therefore, abilities that the brain controls cease functioning. Common post-stroke symptoms are difficulty swallowing, memory loss, and paralysis of muscles. A way for patients to regain a function like muscle control is to do exercises such as: practice writing, pinch clothespins, assemble nuts and bolts, string beads, play checkers, put together puzzles, etc. There exists devices that assist patients in their rehabilitation exercises and also those that tracks their hand usage. Our focus will be on rehabilitation for paralysis of muscle. We want to come up with a tracking device that monitors a patient's hand.
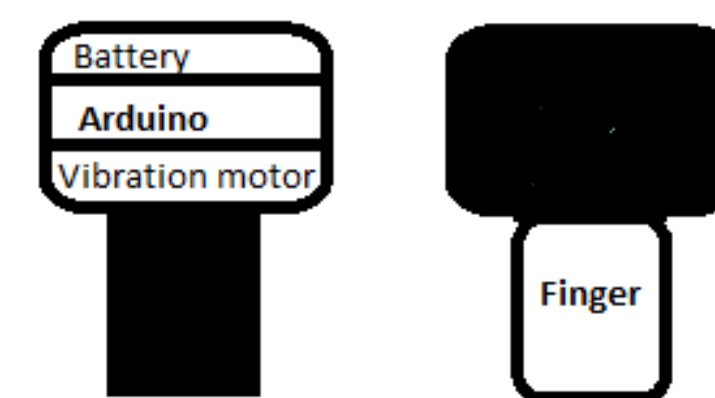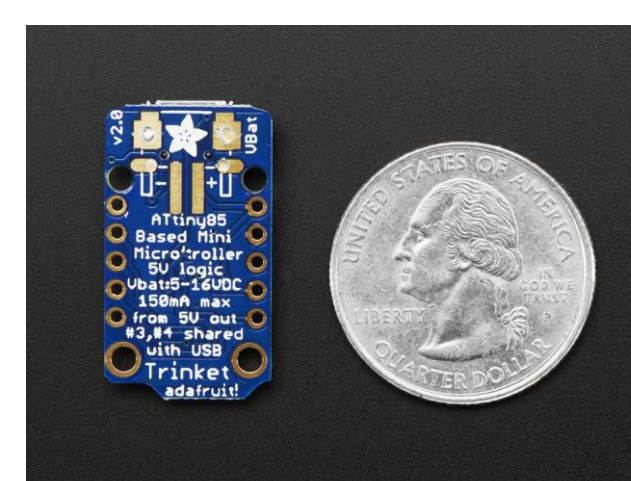
Goal:

Observe rehabilitating patients that have regained or still have enough motor ability to pick up or grasp objects. We want to make a non-obtrusive wearable device that monitors, as closely as possible, how often there is an object in their hand.

Objective:

With the use of an arduino, accelerometer, and vibration motor, we want to log the varying frequency of a patient's hand tremor throughout the day. Tremors varies depending on how stiff their hand is and or the change in mass of said hand. Therefore, holding an object sends a different frequency compared to not holding an object.

Requirements:

1) Non-obtrusive

2) Light weight

3) Long battery life, preferably from waking up to going to sleep

4) Interval measurementation of patient's hand

5) Easy to put on and take off

6) If assembly is necessary, easy to assemble

Design:
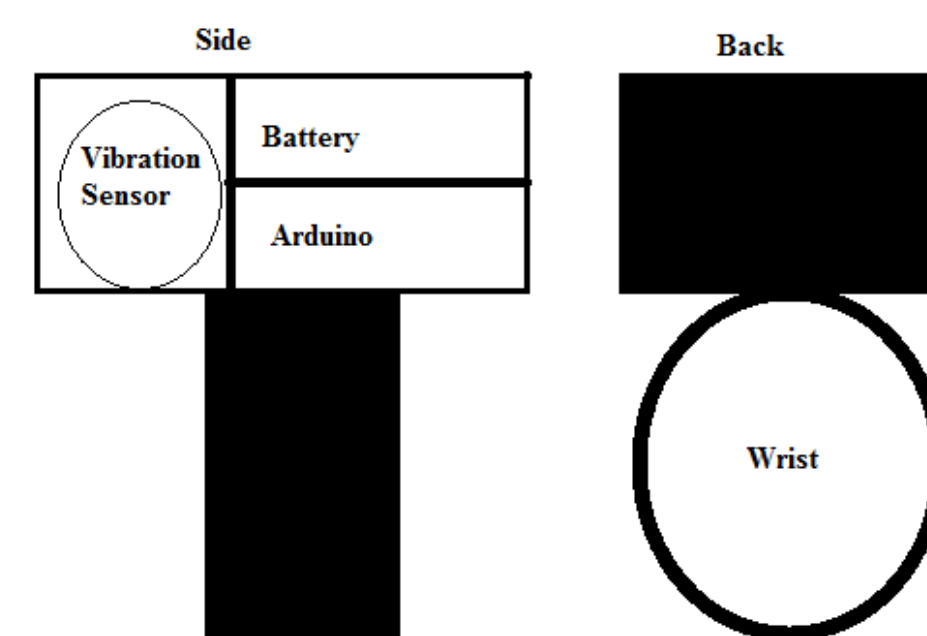
Watch-like design that easily fits around wearer's wrist.

Even more compact design that can be worn on just a finger, like a ring.

Components We Are Going to Use:

Timeline:

Fall	Winter	Spring
• Introduction to project • Research on similar projects in order to gain insight on how we can assemble project • Assess budget • Design	• Begin development and have working model by end of the quarter	• Test device • Debug device

Budget:

Expense ($)	
Vibration Sensor	1.45
Arduino	14.95
Microcontroller	6.95
3D Printing	20
Misc. Cost	5

Team Members:

Calvin Mo (Team Lead, Document Manager)
Email: cwmo@uci.edu
Huining Wang (Safety Manager, Purchase Manager)
Email: huiningw@uci.edu

Advisor:

David J. Reinkensmeyer