Human ECoG Data

- Filtering
- ERP Analysis
- Power Spectral Analysis

Research Question: Will the predominantly used fingers create a larger response spike in the brain?

Hypothesis: The index finger will create the largest response as it is used most often. The thumb will create the next largest response and the middle, ring, and pinky finger will create the least response of roughly similar amplitude.

Intention:

I intend to answer the question of which finger creates the largest signal response within the brain when activated. My hypothesis is that the index finger will have the largest response because it is the most commonly used and therefore will have the most and the strongest connections within the brain. Additionally because it is used for a varying number of tasks such as pointing, grabbing, and gesturing this will further increase it's response. To answer this question I intend to use primarily ERP Analysis.

A study by Ke Liao et al showed that using a support vector machine, a SVM, a computer could predict which finger was used.

I will be using filtering to filter out noise from powerlines and other outside influences in order to clean up the signal. I will then use ERP averaging to get the average response from all the subjects for the spike and will additionally use a power spectral analysis to determine the strength of the signal. Together, these techniques will allow me answer my question of which finger has the largest response.