

Task 3

Task 3 consists of several subtasks with the overarching aim of extracting “response fingers” and response times.

A bit of background:

- The data are collected using a commercial device and MR compatible accelerometers.
- Each accelerometer is sensitive to three dimensions.
- Note that one dimension on one of the accelerometers does not work.
- Accelerometers were mounted on D2 and D5.
- The software started recording when triggered from the python script (same trigger as the EMG)
- Subsequently the software merged all of the segments into one large data string.

Task 3.1: Segmenting

- Start with ‘Run 1’ (see naming of ACC files and output files from box)
- Use the onset or offset of vibration to segment the file into trials.
- What is the sampling frequency?
- What is the duration of the vibration?
- What is the sampling duration after each trigger?
- Plot a trial with the time series for the most sensitive dimension for the finger that is responding.
 - What is happening at the different time points (from vibration to the finger hits the response box)

Task 3.2 Response finger

- What dimension is most sensitive to D2 and D5 movements respectively?
- Can sensitivity be improved if a “resultant acceleration” is computed from two dimensions?
- Which finger corresponds to ‘b’ and ‘y’ in the response box.

Task 3.2 Response times

- Compute RTs from the preprocessed acceleration data.
 - Plot these against the response box outputs.
 - Does it correspond?

Task 3.3 Input finger:

- How can we detect the input finger?
- Make an output that plots the input finger, output finger and RT for each trial
- Plot all data along with the mean/median (dependent on distribution of data) for each of the 4 trial types (conditions).
 - Does the subject display conflict?
 - How about for run 2?

