Date: December 23rd, 2024

Dear Fellow EcoG Researcher,

These are the data from our recordings regarding our paper: “**Spatial and Spectral Changes in Cortical Surface Potentials during Pinching versus Thumb and Index Finger Flexion**”.

Please keep in mind that these anonymized data are from real patients who donated time in a difficult period of their lives to advance our understanding of the brain. Any publication involving these data MUST include the following in the methods section of the manuscript, without modification:

**Ethics statement:** All patients participated in a purely voluntary manner, after providing informed written consent, under experimental protocols approved by the Institutional Review Board of the University of Washington (#12193). All patient data was anonymized according to IRB protocol, in accordance with HIPAA mandate. It was made available through the library described in “A Library of Human Electrocorticographic Data and Analyses” by Kai Miller [*Miller, Kai J. "A library of human electrocorticographic data and analyses." Nature human behaviour 3.11 (2019): 1225-1235*] , freely available at https://searchworks.stanford.edu/view/zk881ps0522.

During our motor task, subjects were cued with a word displayed on a bedside monitor indicating

whether to flex their thumb or their index finger. On a separate task, they were cued in a similar fashion to perform a pinching move between the thumb and the index.

The basic datafiles (in MATLAB format) are named “###.mat” in the folder, where ### denotes the 2 letter patient code. The corresponding subject number for each patient from the manuscript is:

|  |  |  |  |
| --- | --- | --- | --- |
| Subject | WM | CC | BP |
| Age | 19 | 21 | 18 |
| Sex | F | M | F |
| Handedness | R | R | R |

For each subject, there are the following datafiles (in separate folders for finger flexion and pinch, respectively):

Task files of both types, i.e. finger flexion and pinch) have the following variables:

* "data" (time x number of channels): These are the data.
* "dg" (time x number of fingers): These are the finger flexions, measured from the hand contralateral to grid placement. Note that they are in the raw form input. They are in 40ms blocks, and have non-zero offset. The 2 columns correspond to the digits thumb-index in order. Finger positions were recorded using a 5 degree-of-freedom dataglove sensor (5 dt, Irvine, CA).
* "srate": Sampling rate. 1000Hz
* "stim" (time x 1): Screen cue. This is the cue on the screen at each point in time (note that this is different than the timing of actual behavior, which will be revealed by the finger flexion positions, and different for each patient).
* "stimtext": cell array, containing text corresponding to numerical value in “stim”. Sometimes these values are repeated, so that they will be cued at double frequency.

File: “##\_brain.mat” - data to plot electrodes on the brain, with variables:

* "brain": This is a structure representing the tessellated brain surface. It can easily be plotted with the CTMR package *(see “Automated electrocorticographic electrode localization on individually rendered brain surfaces” by D Hermes, et al in Journal of Neuroscience Methods, 2009)*
* "locs" (number of channels x 3): Electrode locations, for plotting on the rendered brain.

File: “##\_beh.mat” - vector with data glove-defined movement onset & offset

* "beh " (time x 1):
  + Pinch folder: 0=rest, 1=pinch
  + Fingerflex folder: 0=rest, 1=thumb flexion, 2=index flexion

In order to reproduce the analyses from the manuscript, download the data from their OSF repository and the code from github. Open the “master\_file.m” and set your working directory to the master folder. You shouldn’t need any dependencies to run the code. All functions are available in the provided toolbox.

Please note that we use a “code-section” approach to programming (each section headed by “%%”), and it is intended that you evaluate each section (control-enter or command-enter) in sequence to understand each step.

Best Wishes,

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