**Instructions**

**1. Setup**

* In this, you will be downloading XCode and three packages (Muse\_LSL\_Stuff, labstreaminglayer, Williams\_Muse\_LSL) and running various files from these folders. You must put all three folders within the same ‘master’ folder. The location of this master folder is up to you.
* Download and install **XCode**: [*https://developer.apple.com/download/*](https://developer.apple.com/download/)
* Download **Muse LSL Tools**: [*https://kylemathewson.com/eeg*](https://kylemathewson.com/eeg) 
  + In matlab, add the main folder (with subfolders) to the path
  + Install Anaconda (**Anaconda3-5.0.1-MacOSX-x86\_64.pkg**)
  + Create two environments using terminal:
    - * pip install matplotlib
      * touch ~/.bash\_profile; open ~/.bash\_profile
      * conda env create -f ***/path/to/***environment\_lsl.yml
      * conda env create -f ***/path/to/***environment\_psychopy.yml
* Download **Lab Streaming Layer**: [*https://github.com/sccn/labstreaminglayer*](https://github.com/sccn/labstreaminglayer)
  + In matlab, add the main folder (without subfolders) and the lsl-matlab folder (with subfolders) to the path.
  + In terminal navigate to the main folder
    - Run: python **get\_deps.py**
* Download **Muse LSL Matlab Tools**: [*https://github.com/chadcwilliams/Muse-LSL-Matlab-Tools*](https://github.com/chadcwilliams/Muse-LSL-Matlab-Tools)
  + In matlab, add the main folder to the path
  + In matlab, run the **LSL\_Compile.m** script

**2. Running an Experiment**

* To run an experiment is easy. How to do it is demonstrated in the **LSL\_Example.m** script.
* **Connect and record with the Muse**
  + You will initiate a connection to the Muse, do an impedance check, and begin recording all with the matlab function **LSL\_Muse\_Initiation.m**
    - Connect to the Muse: this first initiates an applescript that automatically runs the LSL\_Connect.py script from the Muse LSL Tools and will begin a marker data stream within matlab.
    - View your data (impedance check): this then initiates the next portion of the applescript which automatically runs the LSL\_Viewer-V2.py script from the Muse LSL Tools.
    - Begin recording: finally, another applescript will automatically run the LSL\_Record.py script from the Muse LSL Tools, where an indefinite recording will begin.
* **Sending Markers**
  + Within your script simply write: **outlet.push\_sample({'1'},0);**
    - Change the string ‘1’ to whichever marker you like.
* **Shutting down**
  + The function **LSL\_Shutdown.m** should be placed at the end of your script. This simply ends the LSL\_Record.py script, thus saving your data. You will want to manually close all terminal windows (thus, breaking the Muse connection) as well.
* **Data Structure**
  + The data is saved as a CSV file.
  + Each column is an input and time spans across the rows.
  + The columns (in order) are timestamps, TP9, AF7, AF8, TP10, Right Aux, Markers