

Doors Reward Task EEG Preprocessing Pipeline

If you have questions, please contact DEEDLabEEG@gmail.com

This folder contains two custom MATLAB scripts for automatically preprocessing Doors Reward Task EEG data collected from children in the DEED Lab: (1) `door_loop_over_subjects.m`, (2) `door_process_single_subject.m`

(1) `door_loop_over_subjects.m` runs (2) `door_process_single_subject.m` for all files in the user-specified directory

(2) `door_process_single_subject.m` does all of the preprocessing (see below for overview)

Broad Overview of Preprocessing Steps

See script for details on steps and parameters

Step 1: Remove outer ring of electrodes and Cz

Step 2: Downsample to 250 Hz

Step 3: Remove segments without events (i.e., breaks)

Step 4: Apply 30 Hz low pass and 0.1 Hz high pass filters

Step 5: Apply CleanLine to remove 60 Hz electrical line noise

Step 6: Re-reference to the average of the mastoids

Step 7: Automatically reject bad channels

Step 8: Automatically reject artifacted segments with Artifact Subspace Reconstruction (ASR)

Step 9: Apply Independent Component (IC) Analysis (ICA) with Principal Component Analysis (PCA) dimension reduction

Step 10: Automatically select ICs related to eye artifact with ICLabel

Step 11: Copy ICA fields over to data pre-ASR (the data right before Step 8 above) and remove ICs identified in Step 10

Step 12: Interpolate channels removed in Step 7

Step 13: Epoch data into bins (i.e., Reward, Punishment, Neutral) and apply baseline correction

Step 14: Run the TBT plugin to automatically reject artifacted epochs

Step 15: Compute averaged ERPs for each bin