

EEG Dataset for SSVEP Based BCI speller

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Citation: It will be updated soon. Please contact admin.

- **Experimental paradigm**

- **Experiment environment**

- Laboratory environment

- **Research Ethics** • The Institutional Review Board at Gwnagju Institute of Science and Technology approved this experiment (20200511-HR-53-05-01), and all subjects were informed of all experimental procedure and signed written informed consents.

- **Participants**

- 23 Healthy participants (age range: 20-35 years)

- **Task**

- 9-class SSVEP based BCI speller – 4 runs
single run: stimulated 5 times for each class

- 14-22 Hz (1Hz intervals) flickering frequency (trigger information is given below)

- **Experimental environment**

- Experimental period: 9 Jun. 2020~ 6 Jul. 2020

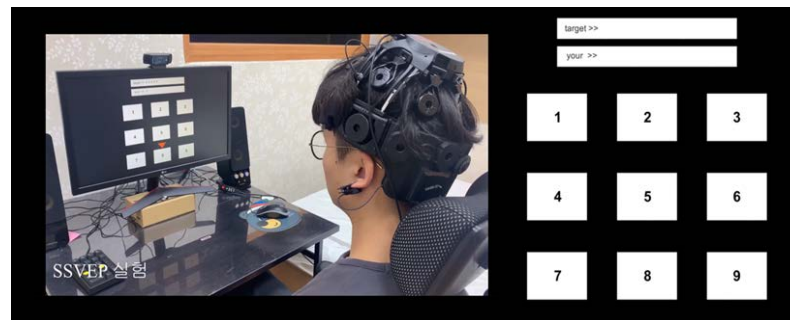


Figure 1 Experimental environment and Experimental setup

- **Experimental paradigm**

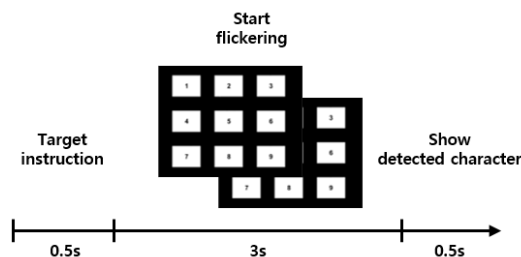


Figure 2 Experimental procedure for session

- **Data recordings**

- **Acquisition devices (Figure)**
- DSI 24 wearable sensing EEG, 19 channels and wired setting
- Pz as CMS, left-right ear mastoid referencing



Figure 3. DSI 24 Wearable sensing EEG

- **Acquisition Software**
- OpenViBE
- **Channel location**
- Total 19 channels:

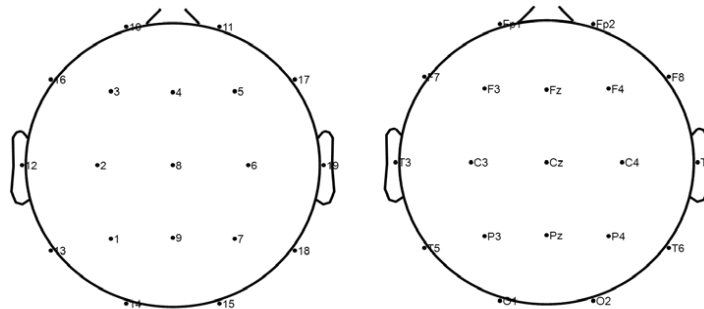


Figure 4 Electrode position used in experiment data

- **File description**

- **File extension**

- MATLAB format (*.mat) (recorded from Open ViBE and converted to mat)

- **File information**

- Each file includes structure format including data, channel location, sampling rate, marker, stimulated frequency and data length

Variables	Description
RAW_data	Raw EEG signals
time	EEG data time vector
ch_locs	Channel information
srate	Sampling Rate
frame	Time window based on trigger
event	Trigger timestamp
subj	Subject number
stimul_freq	SSVEP class and stimulated frequency
trial	Number of trial for each class

- 23 electrode channels (3 non-used extras and 1 reference)
- File name: [sub%d_run%d.mat] – approximate 240 sec. SSVEP based BCI speller.
- Ex) sub1_run1.mat (sub1 – subject number1, run1 - number of experiment 1 at same subject)
- Notch, band-pass filter is not applied. People should pre-process data in order to analyze the data (such as baseline correction, notch, band-pass filtering, ...)
- Good/Bad subjects are not identified
- **Trigger (Marker) information**
- 1: start experiment
- 11,12,13,14,15,16,17,18,19: begin to stimulate and indicate frequency value
- 21,22,23,24,25,26,27,28,29: online results of stimulation
- Online – [0 3000]ms epochs, [P3, P4, Pz, O1, O2], CCA
- 11[14Hz],12[15Hz], 13[16Hz],14[17Hz],15[18Hz],16[19Hz],17[20Hz],18[21Hz],19[22Hz]
- 21[14Hz],22[15Hz], 23[16Hz],24[17Hz],25[18Hz],26[19Hz],27[20Hz],28[21Hz],29[22Hz]