

Progetto MOBD: P300 Speller with patient with ALS

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1 Summary

This dataset represents a complete record of P300 evoked potentials. An users with amyotrophic lateral sclerosis (ALS) focused on one out of 36 different characters. The objective is to predict the correct character in each of the provided character selection steps.

2 The paradigm

The user's task was to copy-write 6 words of five character each. The user was presented with a 6 by 6 matrix of characters (see Figure 1).The user has to focus attention on characters in a word that was prescribed by the investigator (i.e., one character at a time). All rows and columns of this matrix were successively and randomly intensified at a rate of 4 Hz. Two out of 12 intensifications of rows or columns contained the desired character (i.e., one particular row and one particular column). The responses evoked by these infrequent stimuli (i.e., the 2 out of 12 stimuli that did contain the desired character) are different from those evoked by the stimuli that did not contain the desired character.



3 Experimental Protocol

Scalp EEG signals were recorded (g.MOBILAB, g.tec, Austria) from eight channels according to 10–10 standard (Fz, Cz, Pz, Oz, P3, P4, PO7 and PO8) using active electrodes (g.Ladybird, g.tec, Austria).

All channels were referenced to the right earlobe and grounded to the left mastoid. The EEG signal was digitized at 256 Hz and band-pass filtered between 0.1 and 30 Hz. Participants were required to copy spell seven predefined words of five characters each (runs), by controlling a P300 matrix speller. Rows and columns on the interface were randomly intensified for 125ms, with an inter stimulus interval (ISI) of 125 ms, yielding a 250 ms lag between the appearance of two stimuli (stimulus onset asynchrony, SOA). For each character selection (trial) all rows and columns were intensified 10 times (iterations).

4 Dataset

- Number of words: 6
- Number of characters per word: 5
- Number of iteration per character: 10

For each character 120 responses have been recorded ((6 rows + 6 columns) × 10 iterations).

- X = EEG samples [samples × channels*]
- Y = Classes Type [samples × 1] (target stimulus = 1, non-target stimulus = -1)
- C = Stimuli Type [samples × 1] (1...6 rows, 7...12 columns)

channels = 8*204 time steps