BLINKER

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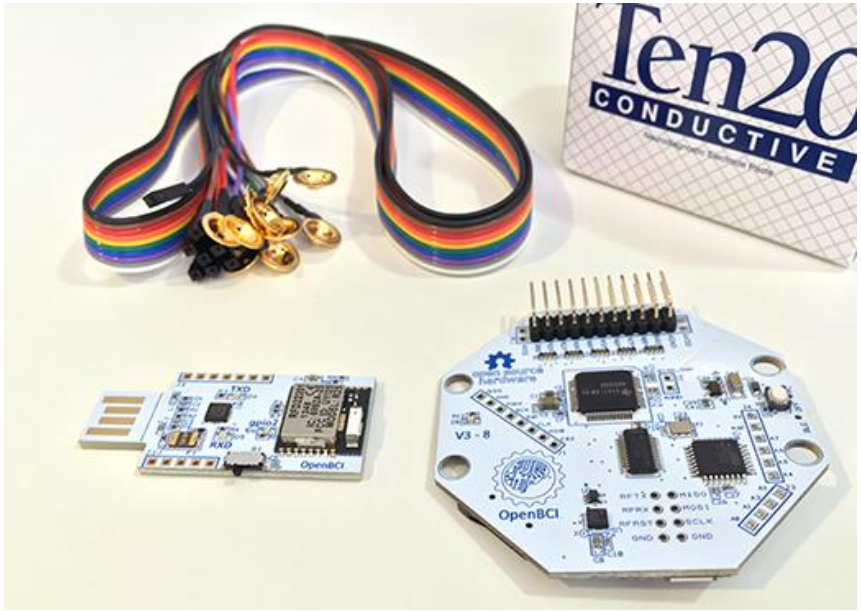
Environment

- OpenBCI
- Matlab



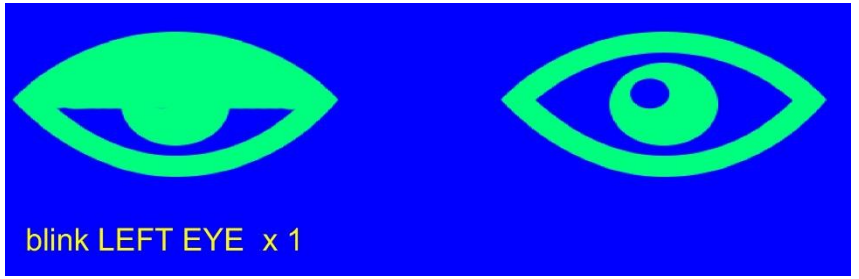
Experiment details

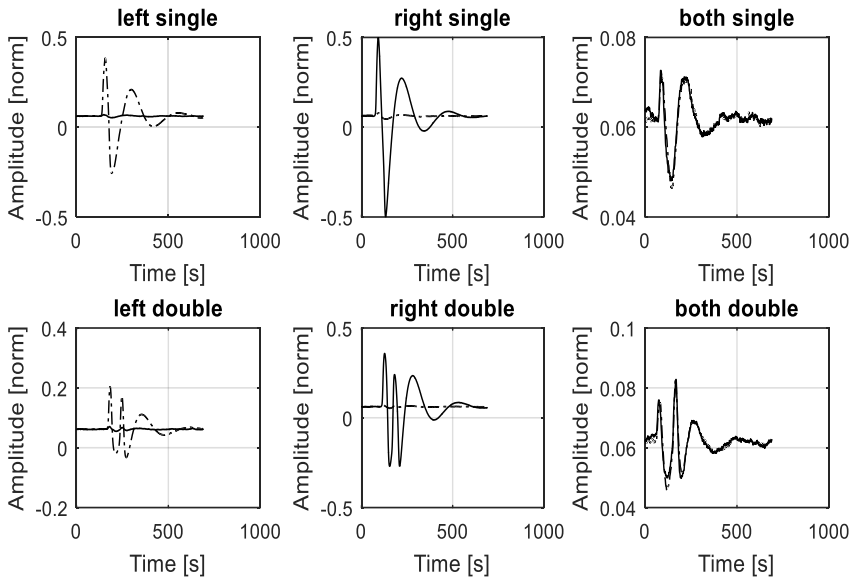
- 12 healthy subjects (seven man and three woman).
  - right-handed,
  - normal vision,
  - did not report any mental disorders.
- EEG data was recorded from two channels (**Fp1, Fp2**) at a sampling frequency of **250 Hz**.
- The experiment lasted about 20 minutes with one subject.
- Calibration and supervised: **3 seconds per condition**

I. Calibration sessions

Two calibration sessions:

- 1st - to make the subject familiar with the sequence of segments;
- 2nd - to calculate the algorithm parameters.

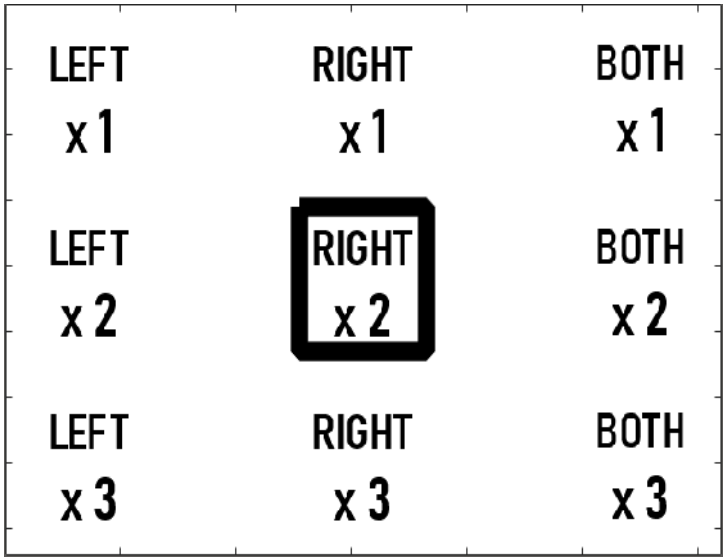




After the first calibration session the experimenter discussed the users' mistakes.

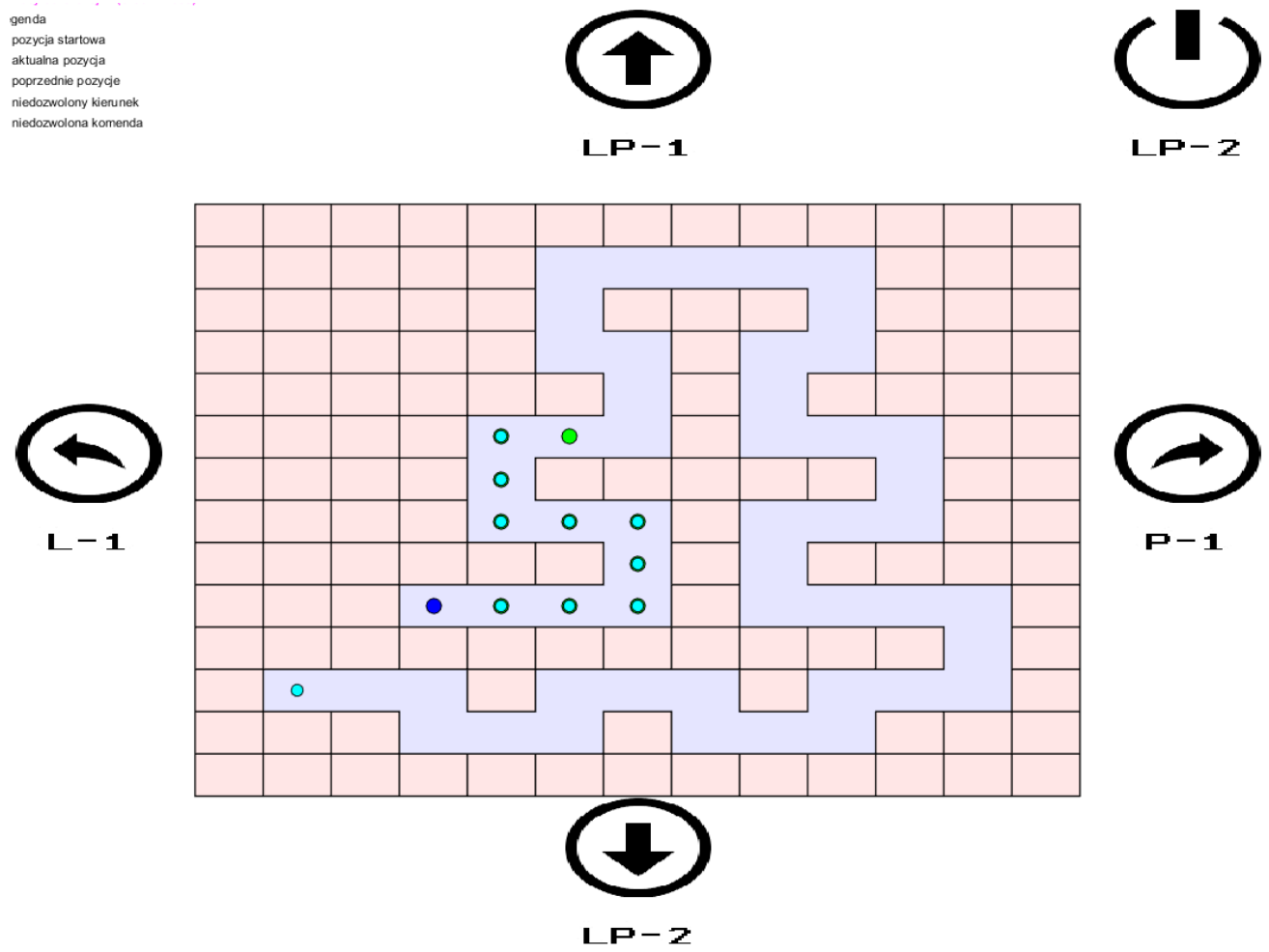
II. The supervised part

- A picture with nine texts informing the subject about his/her task was displayed on the screen.
- Each three seconds a frame was displayed around one of the texts.
- The subject's task was to blink once, twice or three times with left, right or both eyes.

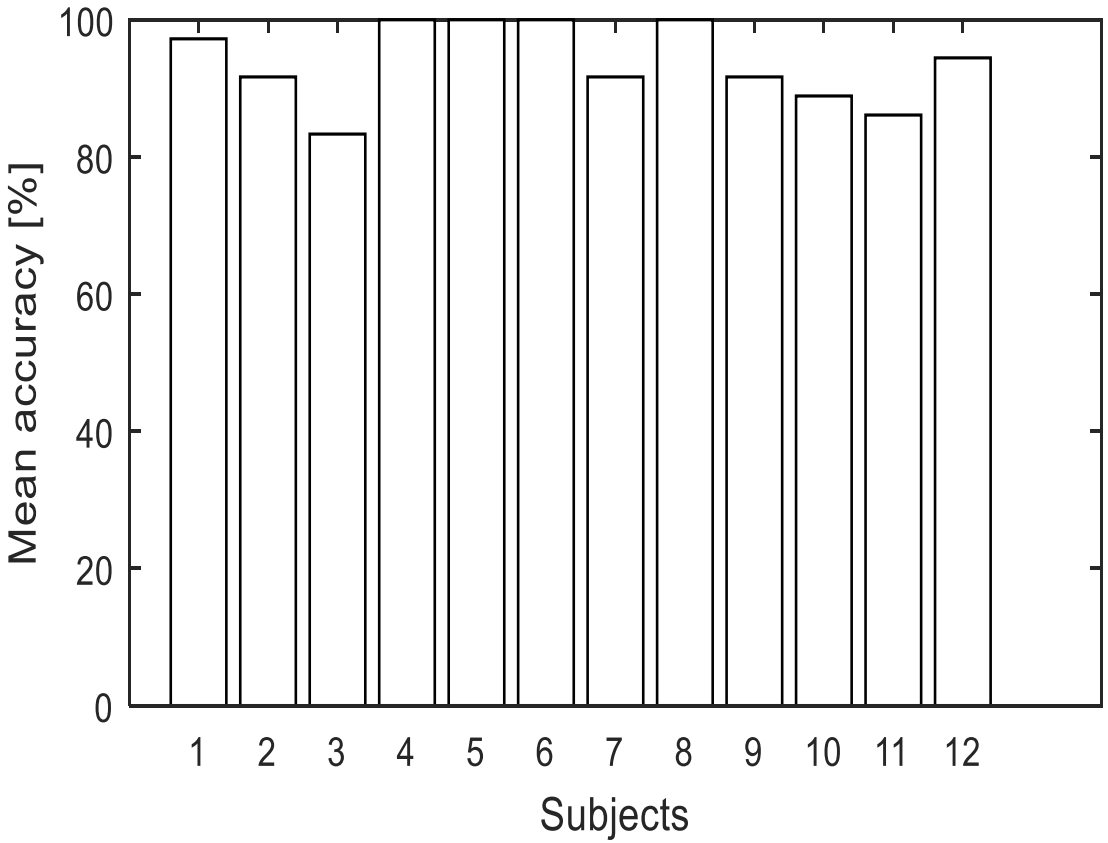


- The experiment consisted of 36 trials, four trials per each blinking scheme (less than 2 minutes).

III. The free user mode



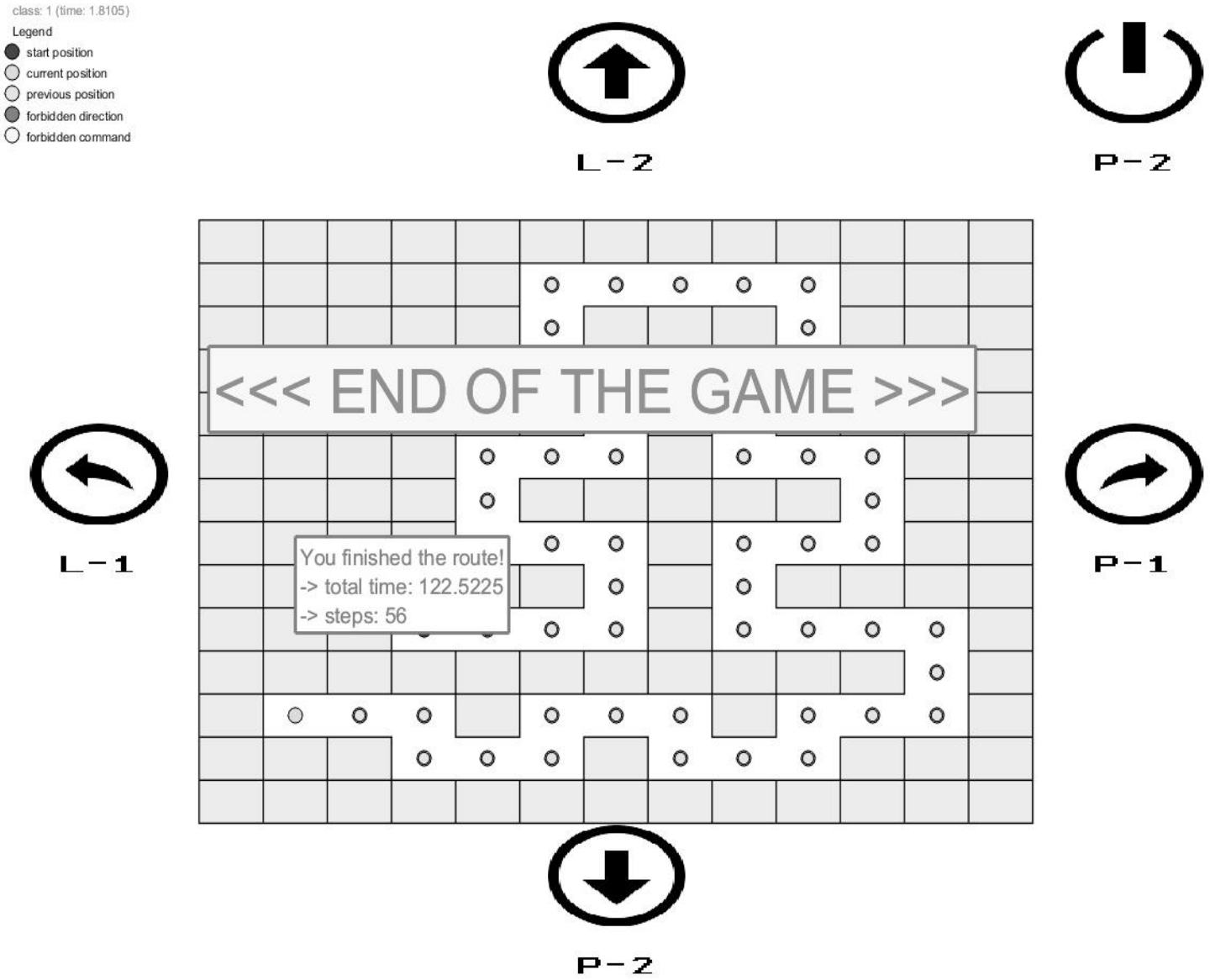
Supervised session – classification accuracy



Supervised session – eye blinking schemes

	Left	Right	Both	Mean
1 x	95.8	100	89.6	**95.1**
2 x	93.8	97.9	85.4	**92.4**
3 x	95.8	91.7	93.8	**93.8**
Mean	**95.1**	**95.8**	**89.6**	**93.8**

The average accuracy for 6 schemes (without „Both” condition): 97%


class: 1 (time: 1.8105)
Legend
start position
current position
previous position
forbidden direction
forbidden command
L-2
P-2
<<< END OF THE GAME >>>
L-1
P-1
You finished the route!
-> total time: 122.5225
-> steps: 56
P-2

The free user mode - results

	No. of steps	Time [s]	No. of mistakes	Accuracy [%]	Time for one command [s]
S1	56	122.52	3	94.7	2.19
S2	54	101.45	1	98.2	1.88
S3	60	143.44	7	88.3	2.39
S4	55	121.57	2	96.4	2.21
S5	54	124.12	1	98.2	2.30
S6	53	102.78	0	100.0	1.94
S7	57	87.41	4	93.0	1.53
S8	55	97.53	2	96.4	1.77
S9	57	131.74	4	93.0	2.31
S10	55	109.74	2	96.4	2.00
S11	57	94.67	4	93.0	1.66
S12	57	128.52	4	93.0	2.25
Mean	56	113.79	2.8	95.0	2.04