

# HEAT THE CHAIR! DATASET

## About this dataset

This dataset consists of EEG (electroencephalogram) and ECG (electrocardiogram) recordings from 17 subjects playing the Serious game named “Heat the Chair!”. This game was specially designed to simultaneously emulate concentration and alertness of pilots while flying. Thus, during a game the player has to maintain a stability of flight controls and at the same time do some required tasks. There are two types of games, without interruptions and with interruptions, which emulates the interaction between the pilot and the air traffic controller. Playing fails have penalties and turn the game harder to play. Figure 1 outlines the main interface.

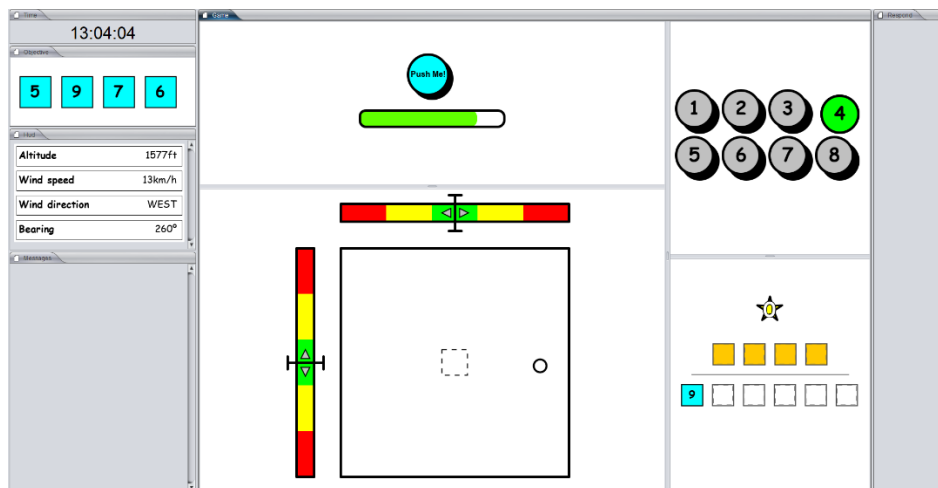


Figure 1. Main interface of the Seriousgame

Dataset contains neuro-physiological data, achieved game scores and self-subjective difficulty perception of the games.

1. EEG signals were recorded using the EMOTIV EPOC+ 14-electrodes headset. For each electrode, this sensor provides raw-data sampled at 128 Hz and power spectral densities at 8 Hz.
2. ECG signals were recorded using the Shimmer device. This sensor provides raw ECG at 128Hz.
3. Data scores provide the achieved punctuations or losses during the game session.
4. Subjective data consists of self-subject workload perception answers to TLX questionnaire in Linkert Scale.

## Files

Recordings and subjective performance are provided into Parquet file format and can be loaded by Python and Matlab. Game performance scores are in csv.

Folder	Filename	Description
eeg_data	seriousgame_eeg.parquet	EEG data
ecg_data	selected_ecg.parquet	Interbeat interval data
game_performance	Subject_x_with(out).csv	Game scores of the game
subjective_performance	selected_tlx_aswers.parquet	Answers to TLX questionnaires in <a href="#">Likert scale</a>

Parquets have intuitive column names to select data, the most important are: 'subject', 'test', 'phase'.

- Subject: identifies the volunteer. Values: subject\_id.
- Test: identifies the two different game mode for each volunteer. Values: { 1=WITHOUT interruptions, 2= WITH interruptions}
- Phase: identifies the sequential stage activities during a session Values: {1= baseline, 2= game}.

### Data acquisition process

Before playing and recording data, the subject was informed about the rules and trained in the Heat the Chair! game during 10 minutes.

Recording sessions were separated into 3 phases as follows:

- Baseline: the subject drags balls to the center of the big square during 3 minutes in order to relax.
- Game: the subject plays the randomly selected game for 10 minutes, either with interruptions or without interruptions.
- Questionnaire: the subject fills a TLX-questionnaire indicating his/her self-perceived game difficulty.

Figure 2 outlines the phases of each experimental session.

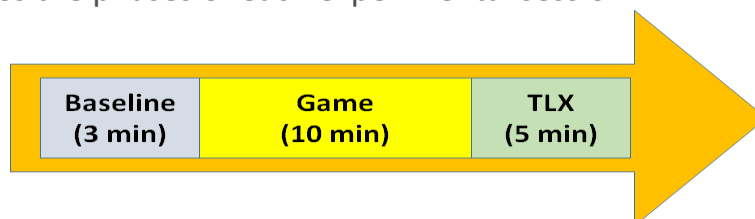


Figure 2: Data recording during an experiment.