This dataset refers to the research **"Natural image reconstruction from brain waves: a novel visual BCI system with native feedback"**. The source paper is available here:

https://www.biorxiv.org/content/10.1101/787101v3

All the data was collected by Anatoly Bobe, Dmitry Fastovets, Maria Komarova, Grigory Rashkov and Andrey Alekseev in autumn 2018, at MIPT Neurorobotics Lab, Dolgoprudny, Moscow Region, Russian Federation.

The data was collected using 128-channel MCS EEG Cap and NVX136 MCS amplifier. Ear references were used for most of the subjects except for those where ear signals were inconsistent and custom re-referencing is required (see ReadMe files in subjects folders).

The protocol included two sessions of the same video observing task. The video consisted of 117 different short clips, belonging to 5 different categories: abstract forms, waterfalls, faces, Goldberg mechanisms and speed. The clips were separated with black screen pauses of 2-3 seconds length. As for now, we cannot include the video itself due to copyright issues. We only provide screenshots of the video clips (except for category 2: faces).

EEG files are placed in the The annotations can be found in 'ann.csv' files, including the following fields:

- labels: id of video clip category (also see 'Label Meaning.txt')
- exemplars: id of video clip source (see _screenshots for actual correspondence).
- onsets_start: the starting point of the video clip referring to EEG signal timeline (in seconds).
- onsets_end: the ending point of the video clip referring to EEG signal timeline (in seconds).

Please mind BAD_CHANNELS.txt files containing the names of channels where visually bad signal data was observed.

For your convenience we also supply the ICA unmixing matrices and topographies (calculated with excluded bad channels already). These were calculated on the whole session data (excluding the pre- and post-stimuli periods and pauses) in Python using MNE library, extended-infomax method. Do not use these matrices during intra-session data classification as this could provide false good results. We strongly advice preliminary visual inspection of topoplots for eye artifacts removal since plenty of saccades occurred with our subjects while watching videos.