



Data-driven Preprocessing of EEG Data

Deep Learning is inspired by the brain structure. Artificial neural networks are inspired by information processing of biological systems. But can deep learning help us to understand how the brain works?

Typically, these brain signals contain a lot of information, but extracting this information is not trivial. Moreover, these brain signals are often burdened in noise. Thus, a rather complex preprocessing of the data is necessary before it can be used for deep learning models.



The main goal of this project is to understand how this preprocessing is related to the performance of the deep learning models. EEG data is typically preprocessed with classical methods, which have been developed for several years.

With the recent advances in deep learning we want to understand how much of this preprocessing can be done completely data-driven with deep learning approaches. In particular, we want to investigate how different components (artefacts) can be extracted from the signal. Recent studies have shown that it is possible to estimate gaze position from brain activity and as such one of the main components that we are mostly interested to be extracted is eye component. This project requires to first go deep enough in understanding EEG signals and then also understand how much of this is possible to be disentangled with deep learning approaches.

In this project, you will have the opportunity to collaborate with a neuroscientist from UZH and work on a new large dataset for eye tracking with 450 participants.

Requirements: Knowledge in Deep Learning, or solid background in Machine Learning. Implementation experience with TensorFlow or Pytorch is an advantage.

Interested? Please contact us for more details!

Contact

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