



## Preprocessing of EEG Data for DL Models

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. In this project we investigate how the different clusters of electrodes impact the accuracy of the models for different tasks (e.g. antisaccade classification task). Moreover, this includes an investigation how the different frequency bandpasses of signal improve or decrease the network performance. Finally, based on our findings, we investigate whether the preprocessing itself (or at least a part of it) can be included in the deep learning models and be learned end-to-end through backpropagation.

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

- Ard Kastrati: [kard@ethz.ch](mailto:kard@ethz.ch), ETZ G61.3
- Damian Pascual: [dpascual@ethz.ch](mailto:dpascual@ethz.ch), ETZ G93