



EEG - Eye Tracking: Segmentation

Deep Learning is inspired by the brain structure. But can deep learning help us to advance our understanding of brain functions?

The collection of eye gaze information provides a window into many critical aspects of human cognition, health and behavior. Brain-computer interfaces can for example be used to decode locked-in patients' brain signals in order to facilitate communication.



The ability to predict a person's eye movement based on brain activity in the form of EEG data offers a variety of applications. In the medical field, it can build a better understanding of diseases; in the psychological domain, the findings and insights are relevant for behavioural researchers. Most generally, mature technology in this area will enable a new interface between humans and machines.

Recent research in this area has demonstrated the feasibility of predicting ET data with a high degree of accuracy from EEG data. The more complex the task under consideration, the limits of existing approaches are being reached.

In this project, we investigate various computational approaches in Pretraining and Knowledge distillation. We aim to improve model performance on tasks such as EEG signal segmentation, as well as distill knowledge from large neural networks to enable the computational feasibility of inference on portable devices. This includes further work on our DE-TRtime architecture by investigating alternative criteria including change point detection approaches. In addition to that, we experiment with self-supervised Pretraining on large amounts of EEG data, as well as representation learning and multi-objective optimization in order to improve performance on downstream prediction tasks.

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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