



Analysis of feature extraction for brain state prediction

Implantable or wearable devices for out-of-hospital monitoring of electroencephalographic signals (EEG) over months to years have the potential to revolutionize diagnostics and treatment of patients suffering from neurological disorders by enabling personalized medicine on an unprecedented scale.

As part of this project, you can explore the analysis, design, and implementation of various feature extraction architectures particularly for short-term and long-term iEEG signals [1]. The objective of this project is to determine which architecture provides more valuable features for a downstream task, in this case ictal/interictal classification, and in potential next step brain state prediction. The feature extractors will be combined with different classification heads. You will use a short-term iEEG epilepsy dataset provided by the SWEC-ETHZ iEEG Database for the initial discovery phase, and possibly a longer-term dataset to produce higher quality results. While a background in ML and PyTorch is necessary, your familiarity with biosignals and creativity in finding new solutions tailored to such signals are fundamental to the success of the project.

If you are interested in this challenging position on an exciting new topic, please send your most recent curriculum vitae including a transcript of grades by email to:

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[1] SWEC-ETHZ iEEG Database: <http://ieeg-swez.ethz.ch/>