Budapest University of Technology and Economics, PhD school in Psychology,
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Harnessing the power of the multidimensional signal: Quantitative electroencephalographic analysis to infer state and trait signatures from polysomnography

- Thesis abstract -

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In my thesis I aim to summarize the biggest milestones throughout the evolution of sleep research focusing mainly on the specific aspects of the neurobiology of sleep regulation related to the processes and states investigated in the included studies. Based on the evidence from neurobiology of sleep mainly provided by animal studies, I further highlight the most important reasons advocating for EEG as the best method of investigating sleep and the dynamic changes between the sleep- and wake promoting system in humans. Furthermore, I present the two most frequently used methods of quantitative EEG analysis (spectral analysis and phase synchronization) and provide examples throughout the five studies attached, of various ways to use these methods to investigate different aspects of information processing (e.g. memory consolidation) and arousability during sleep.