Masterarbeit

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My master thesis **"Investigating the Neuronal Basis of Learning Processes and Memory Formation in Children and Adolescents with Various Psychiatric Disorders"** can be found on GitHub

Key Takeaways

- **Topic:** Using EEG to track successful learning in children and adolescents with psychiatric disorders
- **Method:** Analyzing existing data set
- **Stand out:** Large data set (n > 1000),
- **Main pitfalls:** Model fit, confoundation, validity of EEG
- **Grade:** 6

What was is about?

It has been suggested that an EEG brain marker can be used to track successful learning. To investigate whether this still holds in a sample of children and adolescents with psychiatric disorders and/or learning problems, such a sample was analysed. More specific a sample of over 1'000 participants with a longitudinal data structure (i.e., data point every 2 ms during a learning task) was analysed using linear mixed-effects models. The results indicated that the same EEG marker can be used in such a population, therefore paving the way for using brain data to aid learning and help with identifying individuals with learning problems.

What I've learned?

A big part of this thesis consisted of preparing and analyzing a large complex data set (12 GB). This was an interesting experience in which I could learn a lot about programming and challenges that come with such a data set. Additionally, a deeper understanding of complex mixed-effects models was gained. Especially, the limits when it comes to fitting non-normal data and interpretation of the resulting coefficients was challenging. There are still questions regarding the validity of the investigated EEG marker that couldn't be answered with my thesis. This was due to the nature of EEG data and confounding variables that couldn't be controlled for. Nevertheless, research in this area could possible lead to promising tools that may be helpful in clinical or school settings.