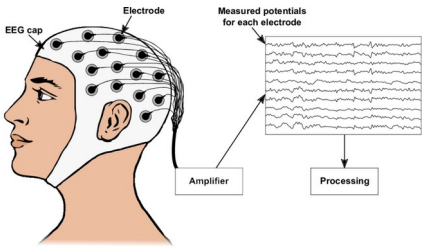
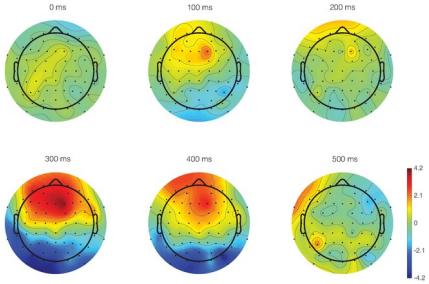
# Decoding Neural Correlates of Music Perception and Enjoyment Using EEG Signals

TECHNISCHE UNIVERSITÄT DARMSTADT

## Proposal for a Master's or Bachelor's Thesis

Understanding how neural activity correlates with subjective experiences of music is a key endeavor in music psychology and neuroscience. Electroencephalography (EEG) provides a window into real-time brain activity during music listening, offering insights into the neural mechanisms underlying music perception and emotional engagement. The NMED-T dataset offers a unique opportunity to investigate this relationship, containing both EEG recordings and behavioral ratings from participants listening to real-world musical excerpts. This research proposal aims to harness the power of machine learning, specifically neural network algorithms, to analyze the NMED-T dataset. The primary objective is to uncover intricate patterns within EEG data that correlate with different facets of music perception and emotional engagement. By employing advanced computational techniques, we seek to delve deeper into understanding the neural mechanisms underlying human responses to music.




Approach:

- Data Preprocessing: EEG data preprocessing will involve artifact removal, filtering, and feature extraction to prepare the data for analysis
- Feature Engineering: Extract relevant features from the preprocessed EEG data, such as spectral power, coherence, and event-related potentials
- Model Selection and Evaluation: Develop neural network models to learn from EEG data, predict behavioral ratings using EEG features, and evaluate model performance with accuracy metrics

**Requirements:**

- Proficiency in machine learning and deep learning
- Strong Python programming skills
- Familiarity with EEG data analysis
- Experience with large datasets

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CCPS Control and Cyber-Physical Systems