**Masterarbeit**

Time-Frequency Analysis for Emotion Feature Extraction

Motivation

Emotions are a vital part of communication, and for individuals with speech impairments, the inability to express emotions can lead to isolation. This project aims to develop advanced time-frequency analysis techniques, like wavelet transforms and STFT, to extract emotion-related features from brain signals. By accurately detecting emotions, we can create more expressive and natural communication systems for Brain-Computer Interfaces, helping users convey both their thoughts and emotions more effectively, ultimately improving their quality of life and interactions.

Emotion Detection in Brain-Computer Interfaces

EEG
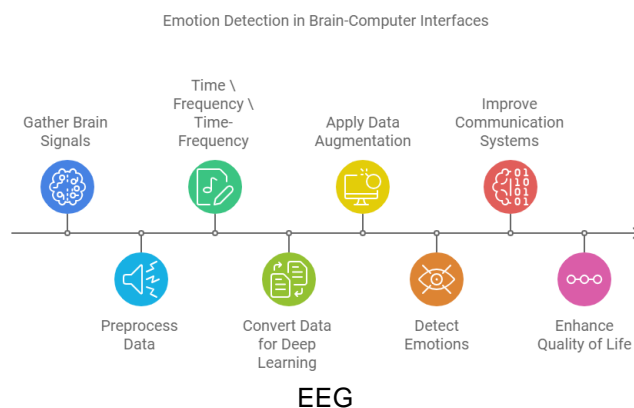
Key Concept

The key goals of this project involve gathering brain signals EEG, with a focus on areas related to speech processing. Data will be collected from healthy individuals. Preprocessing steps will remove noise and extract relevant features using methods like PCA, ICA,and Advanced time-Frtequency analysis (Master Only), converting the data into formats suitable for deep learning models. Additionally, data augmentation techniques, such as signal transformations and noise injection, will be applied to enhance the dataset and compensate for limited training samples.

Prior knowlege

–   Experiences with Python programming
–   Basic knowledge of signal processing techniques

Research area

–   Signal processing
–   Neuroscience

Studiengang

[x] Elektro- und Informationstechnik
[ ] Informatik
[x] Mechatrinik
[x] Medizintechnik

Alignment

[x] Method development
[x] Research
[x] Implementation
[x] Modelling

Start

Immediately

Links

Mitarbeiter

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