1. Classification of EEG signals (thinking or resting) using Machine Learning

The idea is to acquire/use datasets from the brain when subject is thinking or resting. Machine Learning (ML) algorithm (s) will be trained on the acquired datasets and will be used to classify the subject's brainwaves in real time into thinking or resting.

The main idea is to classify brainwave forms to interpret states of the brain. The acquired data from brain could be passed to ML algorithm(s) to predict whether a person is thinking or resting. Machine algorithm(s) identifies a certain pattern in the acquired data to distinguish between thinking or resting state. The reason to rely on a machine learning based approach is inherent noise and variance in the acquired data that any human would not reliably be able to filter out himself/herself manually.

Our goal is to develop application based on machine learning to classify brainwaves in real time into thinking or resting states.

Motivation: In the near future, we envision these techniques to enable early diagnosis systems for the detection of neurodegenerative diseases. We can also use them to show signature patterns in physiological data. This can range from spine injuries to heart disease or cancer. This could even change how we treat early diagnosis.

Some relevant literature:

[1] Using Machine Learning to Categorise EEG Signals From The Brain to Words https://towardsdatascience.com/using-machine-learning-to-categorise-eeg-signals-from-the-brain-to-words-728aba93b2b3

[2] Notion in Motion: Wireless Sensors Monitor Brain Waves on the Fly https://www.scientificamerican.com/article/wireless-brain-wave-monitor/