

# Joint Velocity Decoding and Visualization

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May 2024

# Outline

Project Goals Review

Previous Work

Preprocessing

- Remove Ocular Artifacts

- Bandpass Filtering

# Project Goals Review

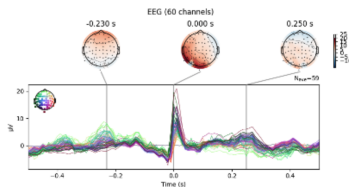
- ▶ Create a **GUI** that allows users to gain an **intuitive understanding** of some of the data **preprocessing** steps and **trade-offs** between different methods with regards to using EEG data to predict joint movements.
- ▶ This would:
  - ▶ Provide a brief roadmap to researchers and college students
  - ▶ Allow the user to gain intuition behind parameters through interactive visualization

# What has been done previously

The dataset we are using is from a paper that was published in 2021

- Pros:
- Cons:

The MNE-Python to visualized the data [2]



- Pros: Good Visualization
- Cons: Requires high technical knowledge

# Remove Ocular Artifacts

► We

# Bandpass Filtering

- ▶ Bandpass filtering removes other more arbitrary noise from the data after known artifacts have been removed.
- ▶ We filter the data between 0.09 and 45 Hz.

# References

- [1] He, Yongtian, et al. "A Mobile Brain-Body Imaging Dataset Recorded during Treadmill Walking with a Brain-Computer Interface." Scientific Data, vol. 5, no. 1, 24 Apr. 2018, <https://doi.org/10.1038/sdata.2018.74>. Accessed 2 Apr. 2020.
- [2] Alexandre Gramfort, Martin Luessi, Eric Larson, Denis A. Engemann, Daniel Strohmeier, Christian Brodbeck, Roman Goj, Mainak Jas, Teon Brooks, Lauri Parkkonen, and Matti S. Hämäläinen. MEG and EEG data analysis with MNE-Python. Frontiers in Neuroscience, 7(267):1–13, 2013. doi:10.3389/fnins.2013.00267.