Using Brain-Computer Interfaces to detect Emotions with EEG Signals

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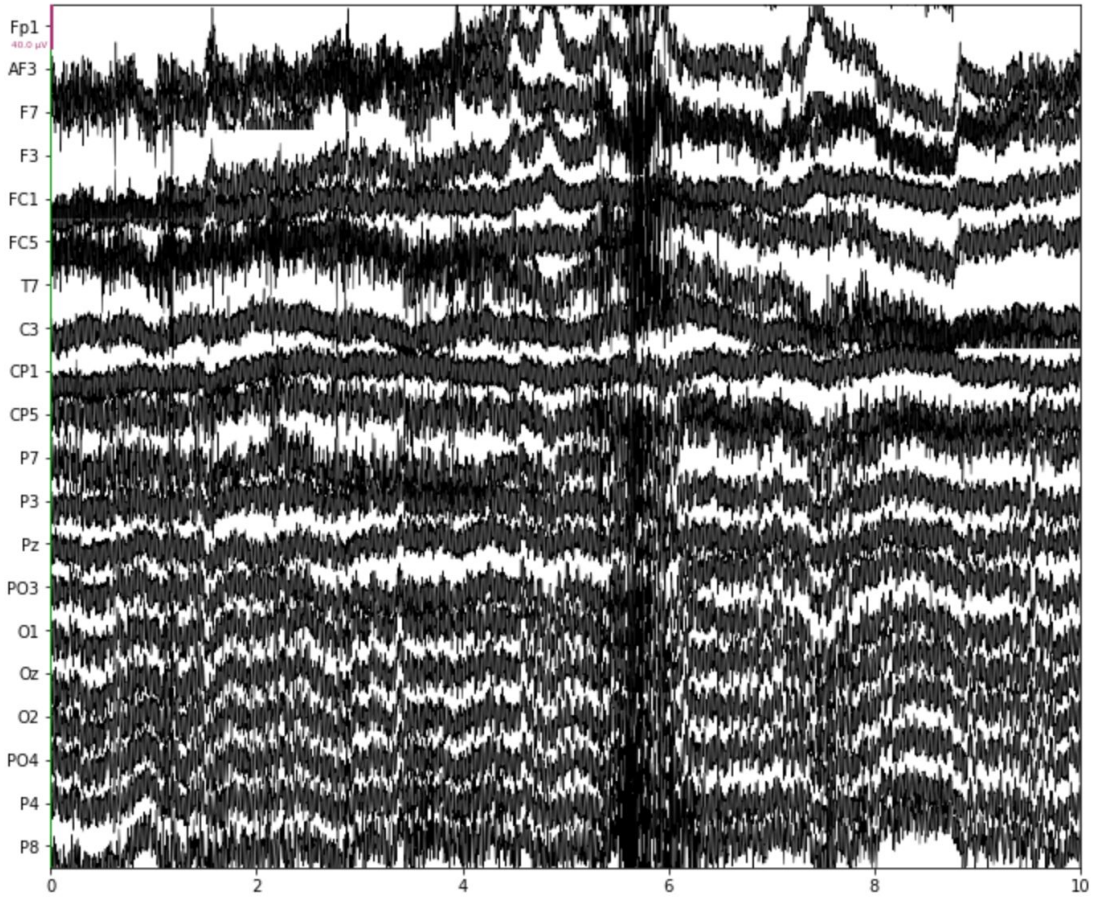
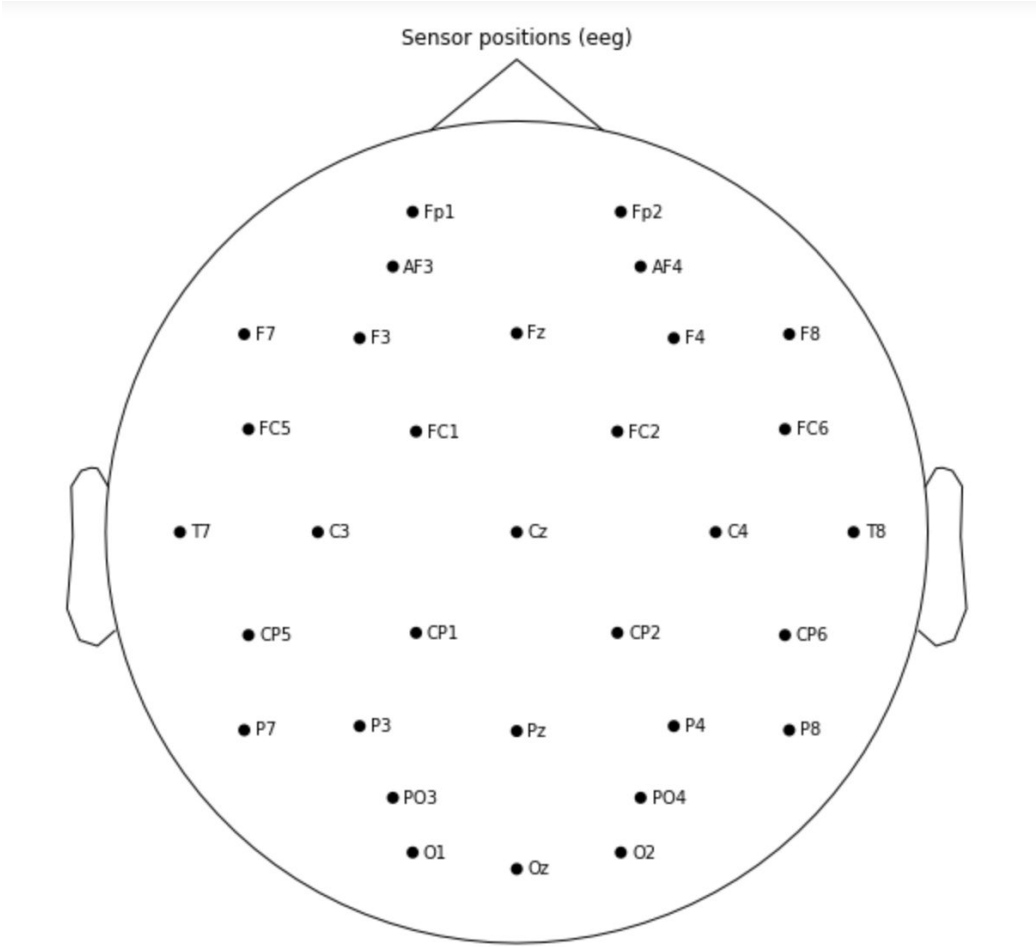


What is EEG?

Raw EEG data plotted before processing signals

Dataset and Motivation

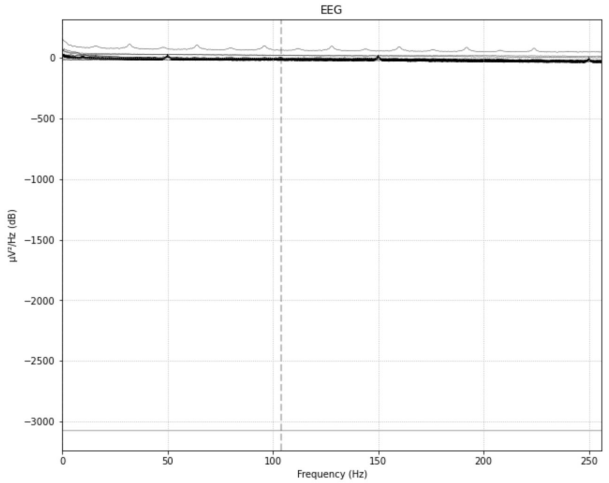
MNE-Python



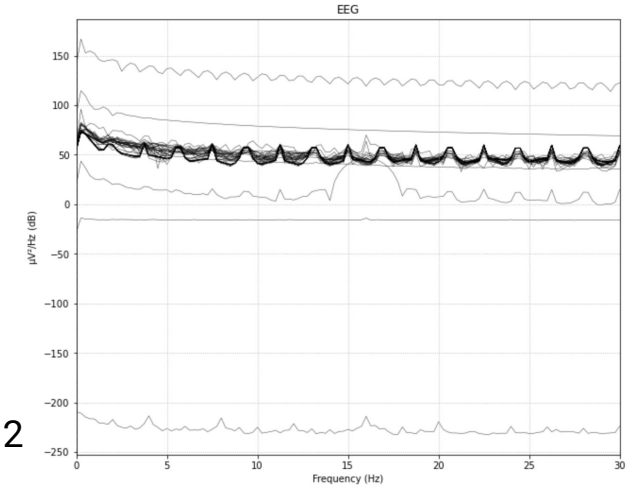
Sensor Locations:

- Biosemi32
- 32 Channels
- 10/20 Standards
- Naming Conventions

1



2



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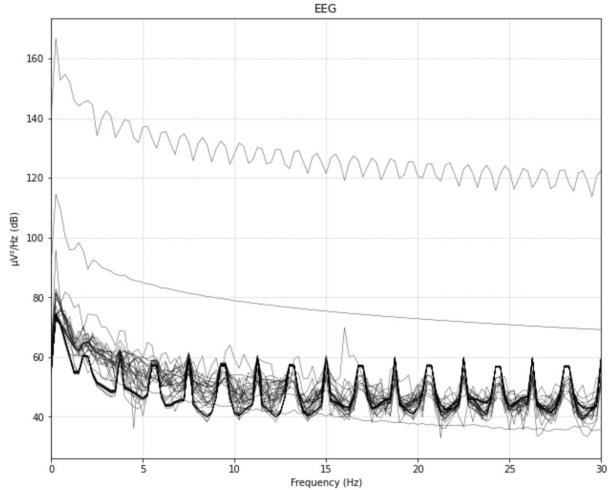

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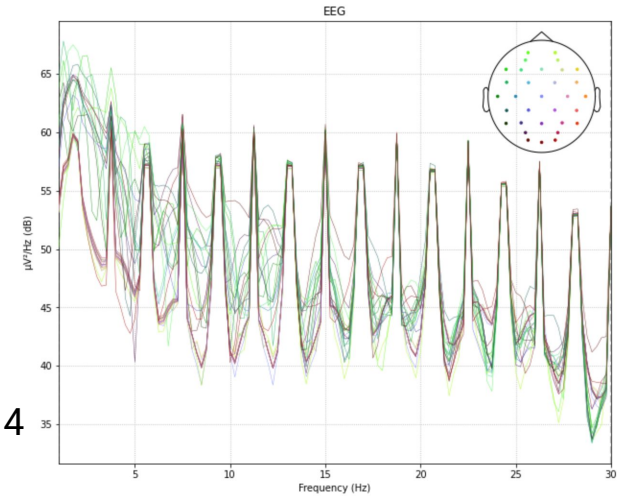
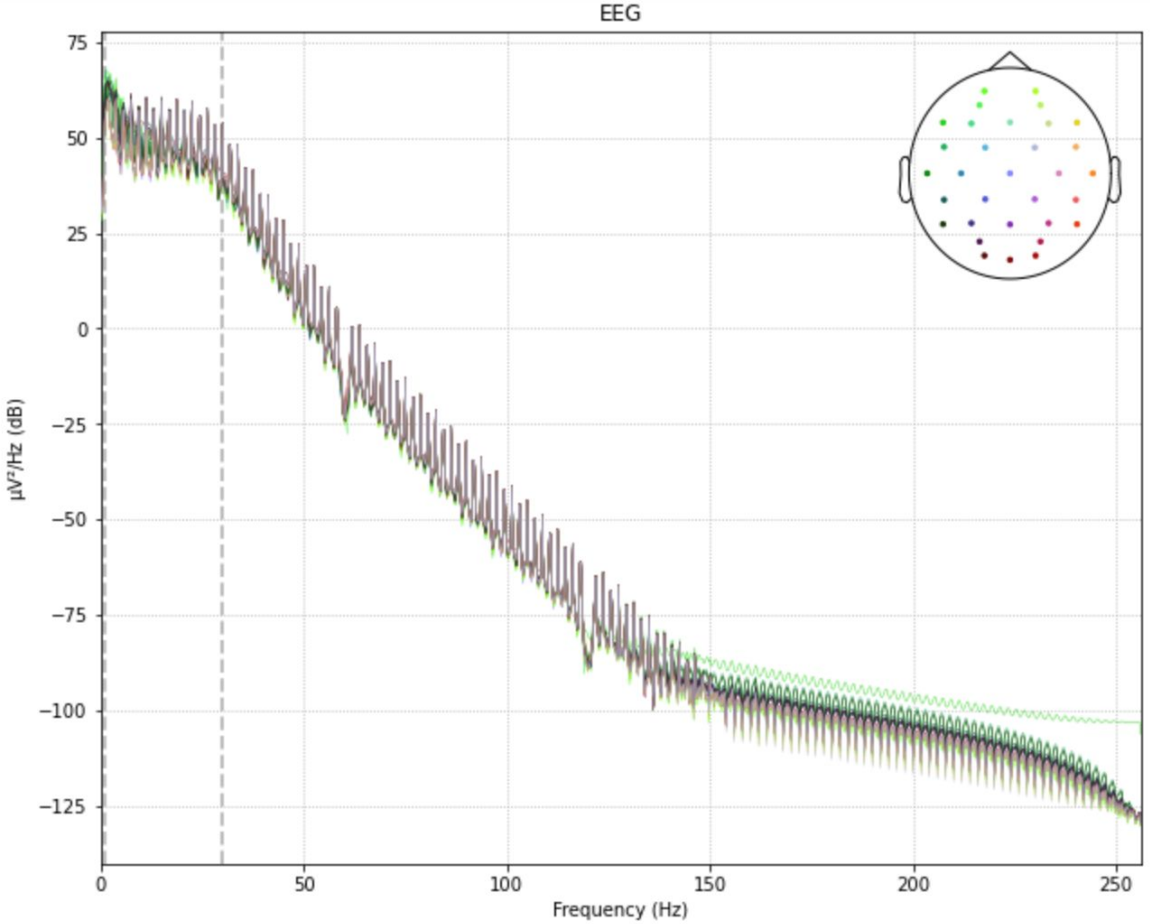
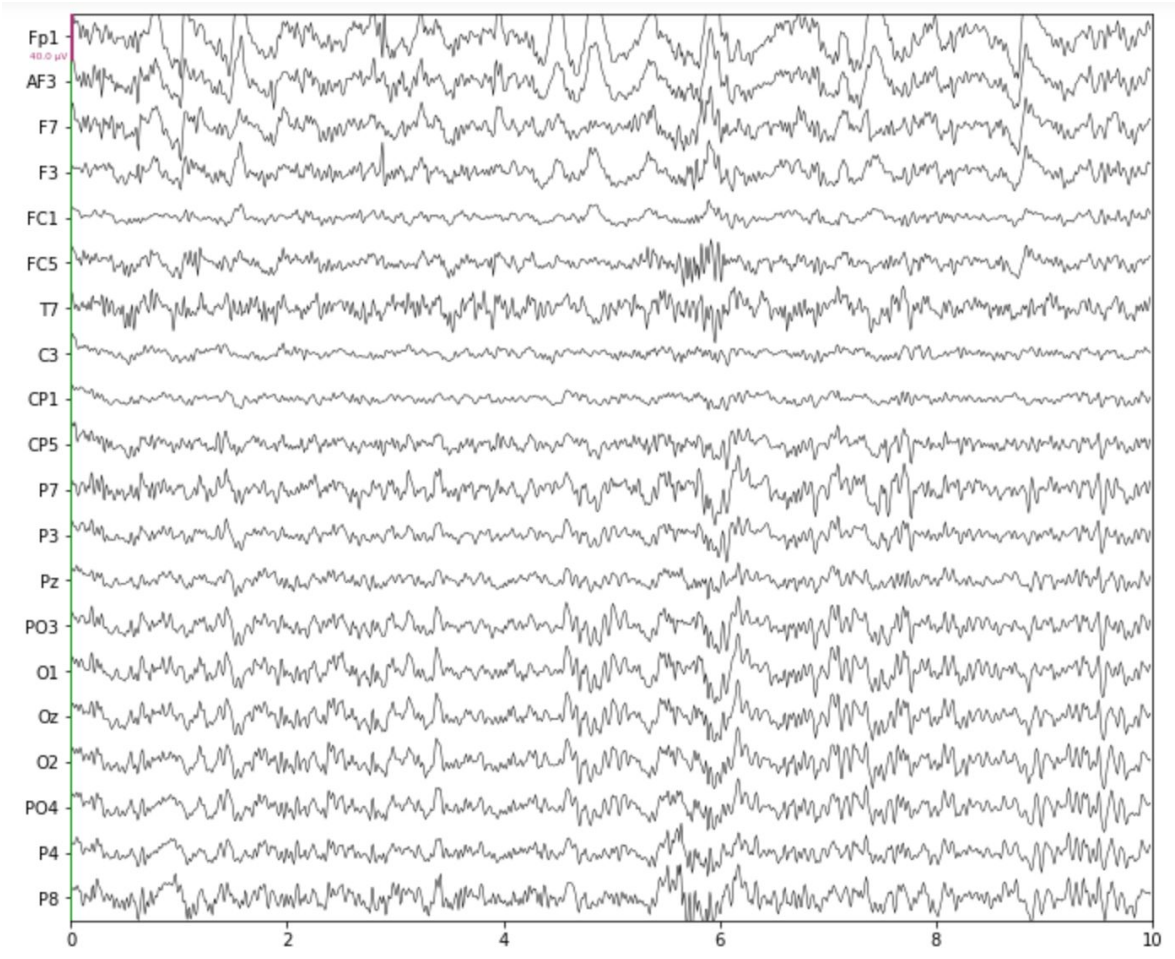


Power Spectral Density

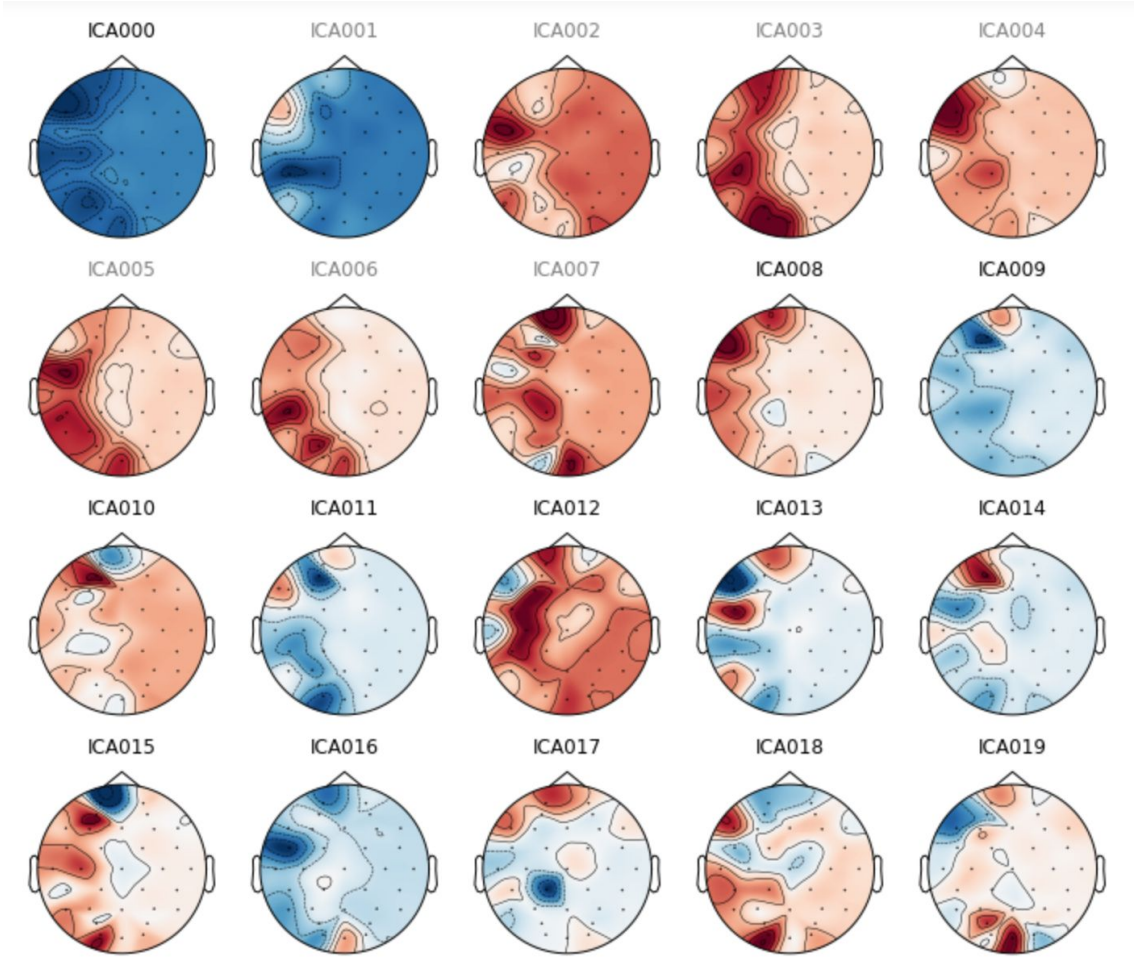
1. PSD All Channels
2. PSD All Channels - GSR2
3. PSD Frequency cutoff at 30Hz
4. PSD EEG Signals only - 30Hz



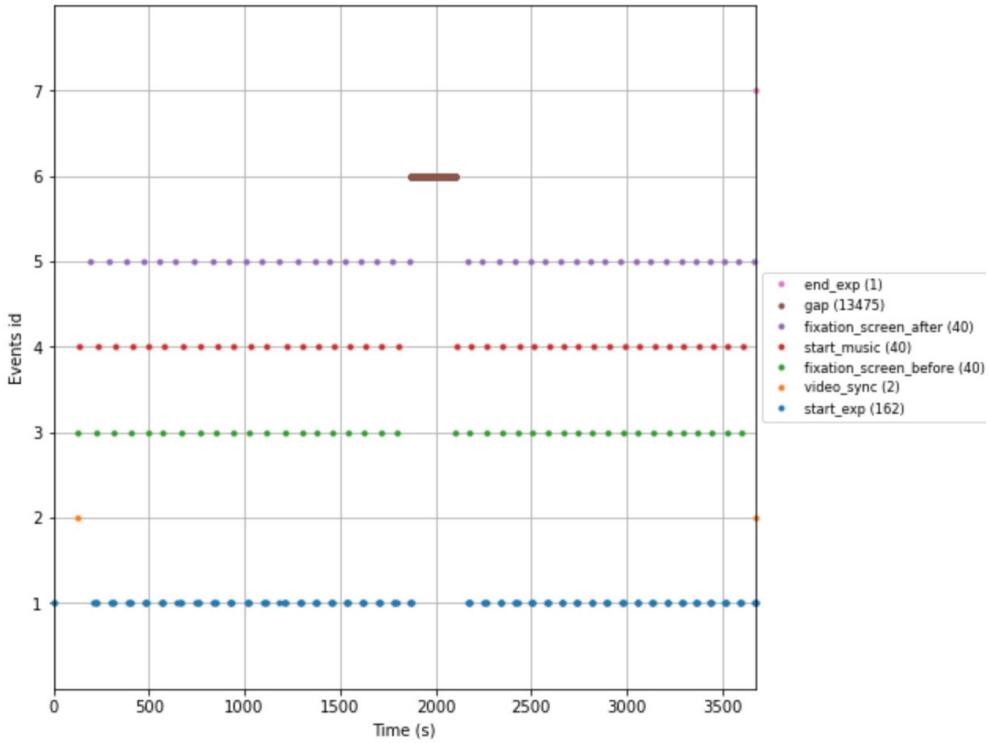
Full Power Spectral Density with only EEG Channels

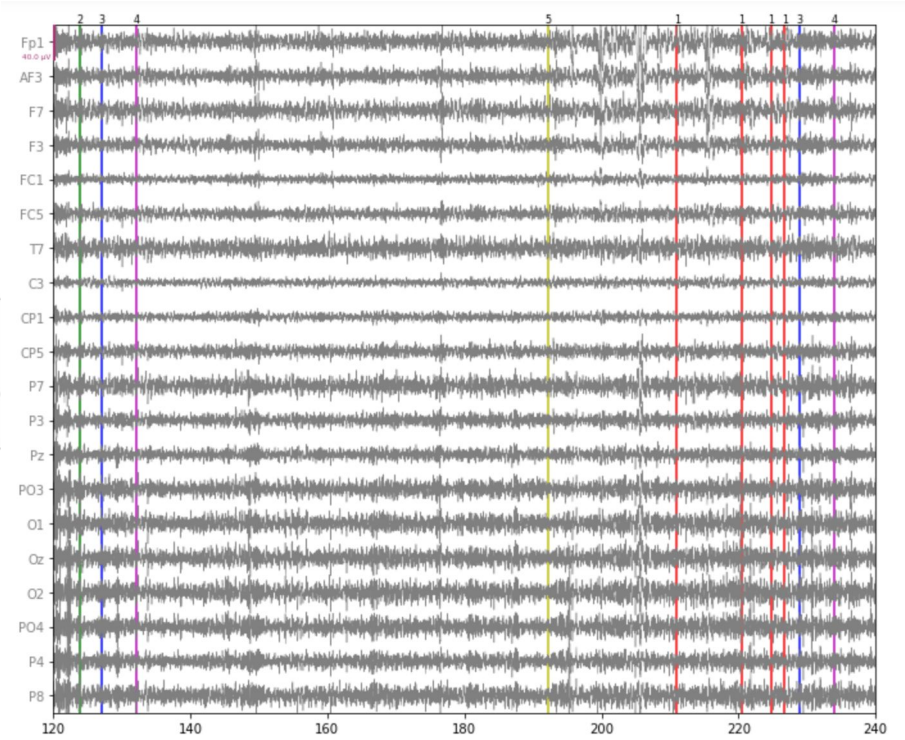


Raw data plotted after bad and unused channels removed and frequency cutoff at 30Hz

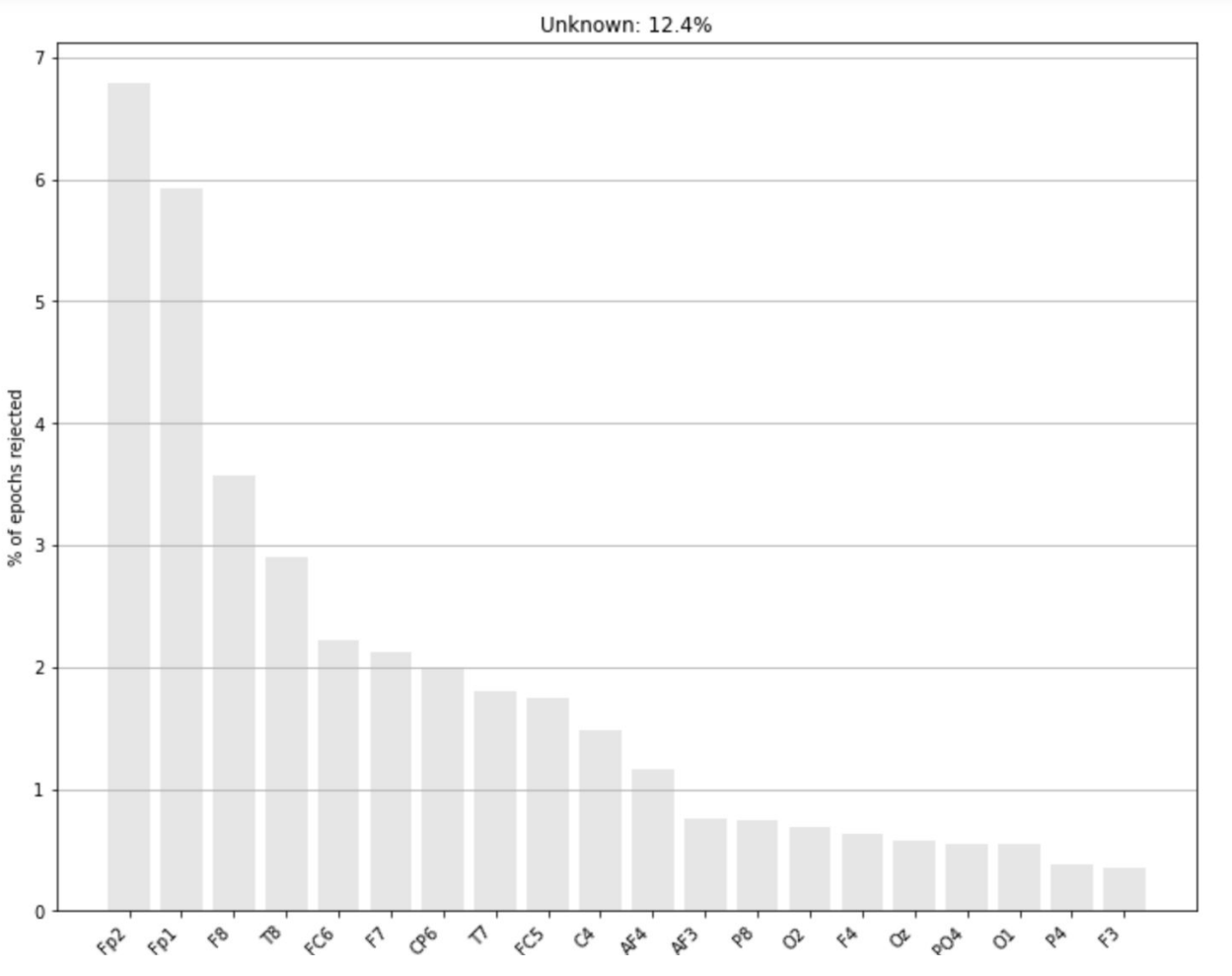


ICA Artifacts Removal- Components with high eyeblink artifact density

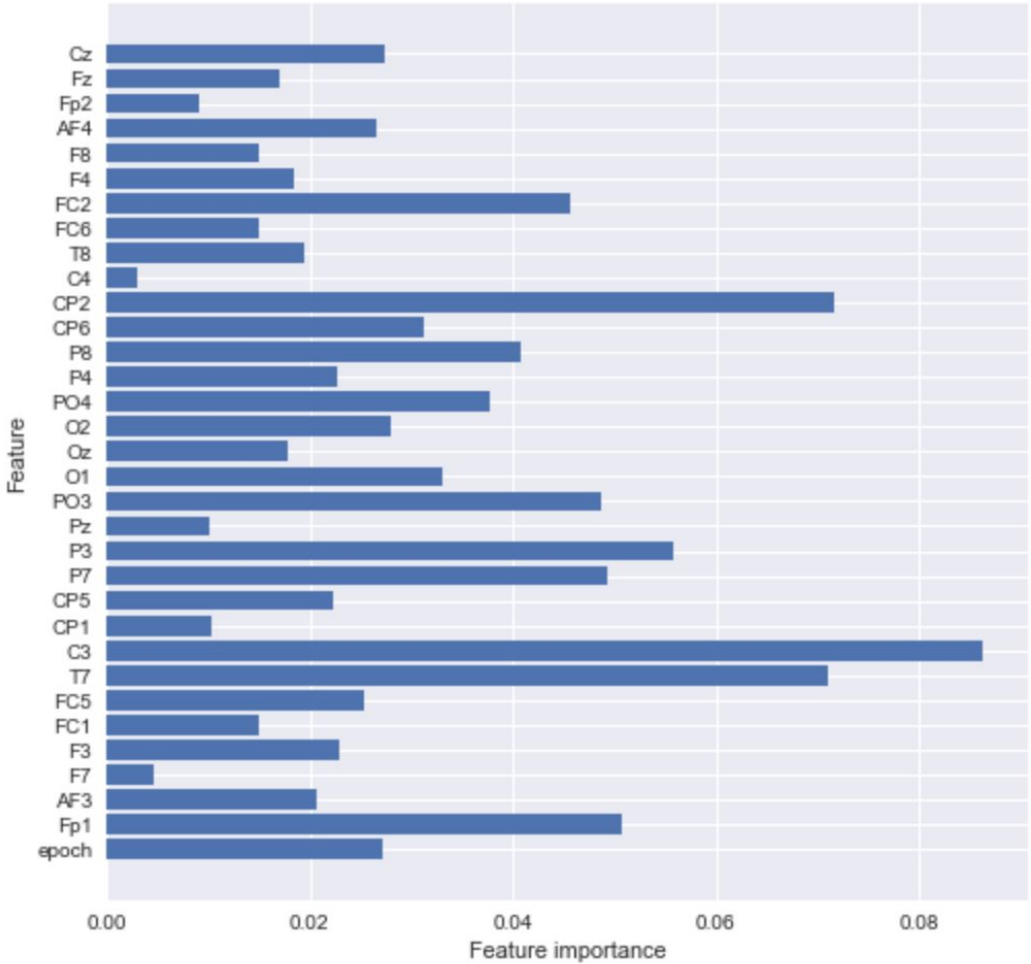




Finding Events and Epochs



Percentages of epochs rejected for each channel



DT Feature Importance

Conclusions and Moving Forward

Thank you