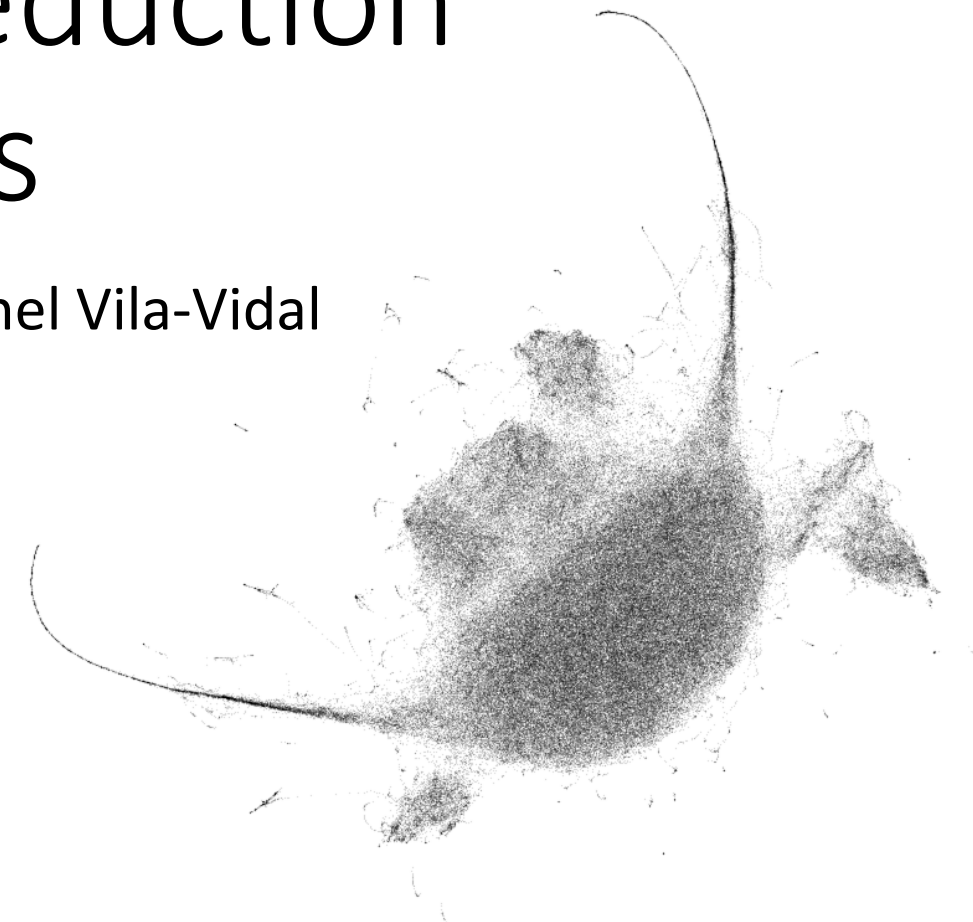
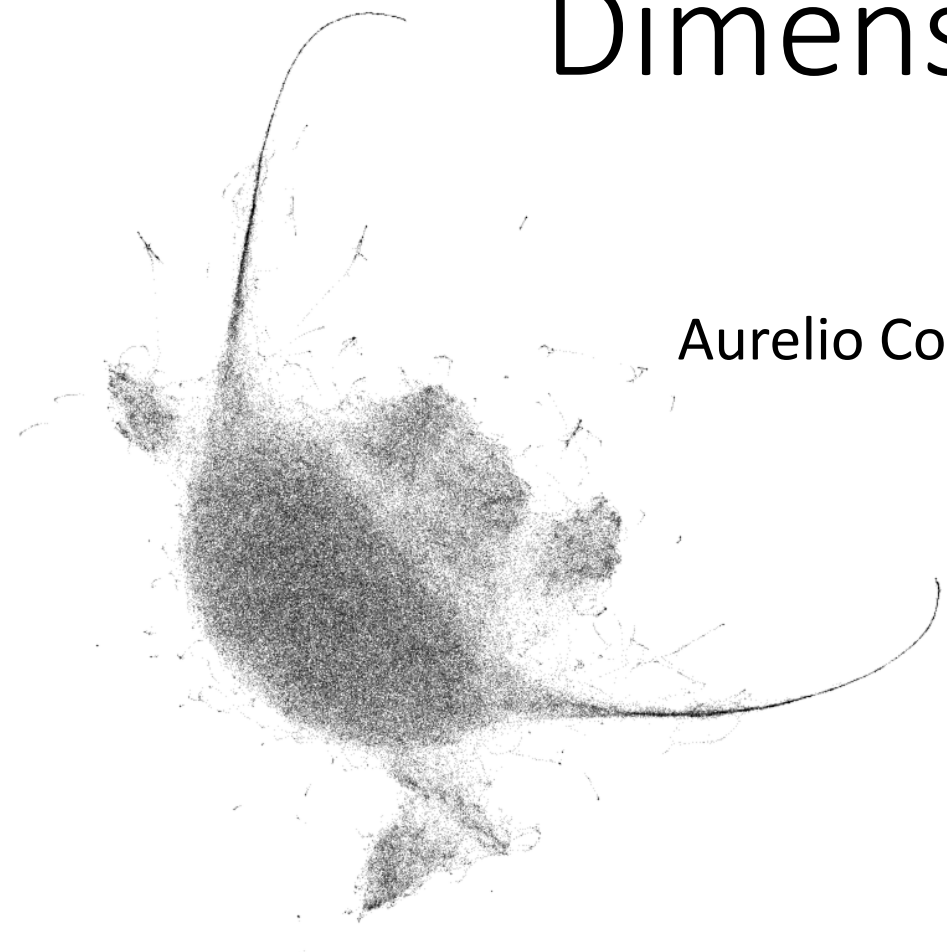
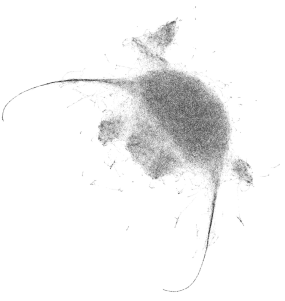


An Exploration of Dimensionality Reduction Techniques

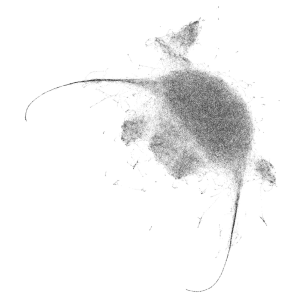
Aurelio Cortese, Amna Hyder, Manel Vila-Vidal



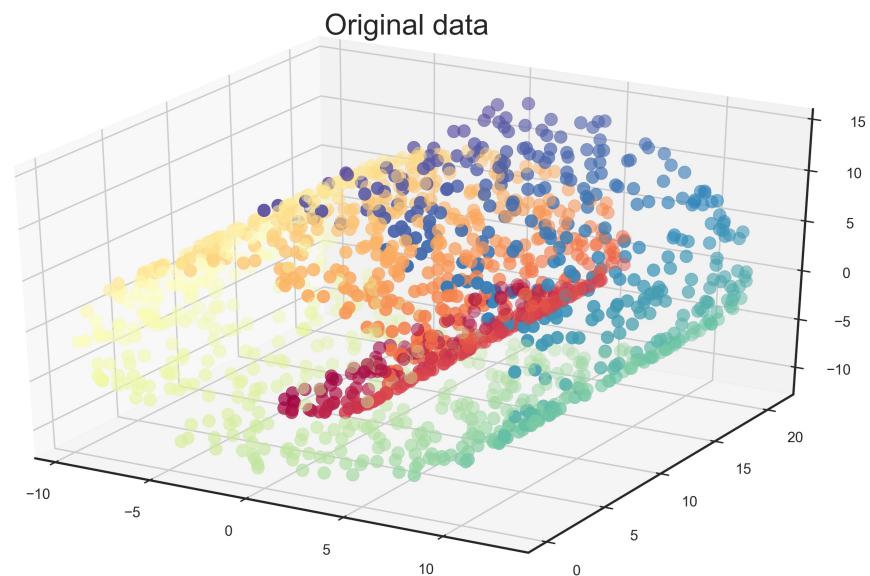


Dimensionality reduction techniques

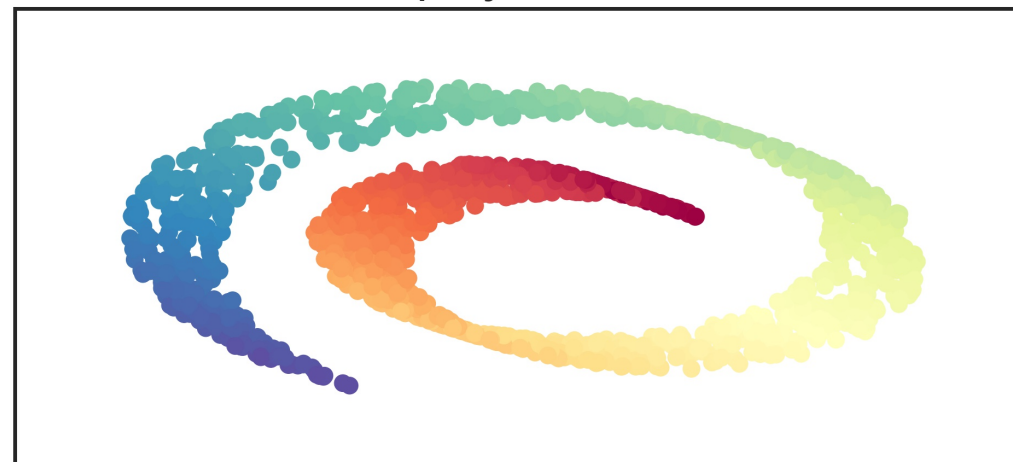
- Linear Dimensionality Reduction
 - PCA
 - ICA
- Non Linear Dimensionality Reduction
 - Local Linear Embedding
 - Laplacian Eigenmaps
 - UMAP



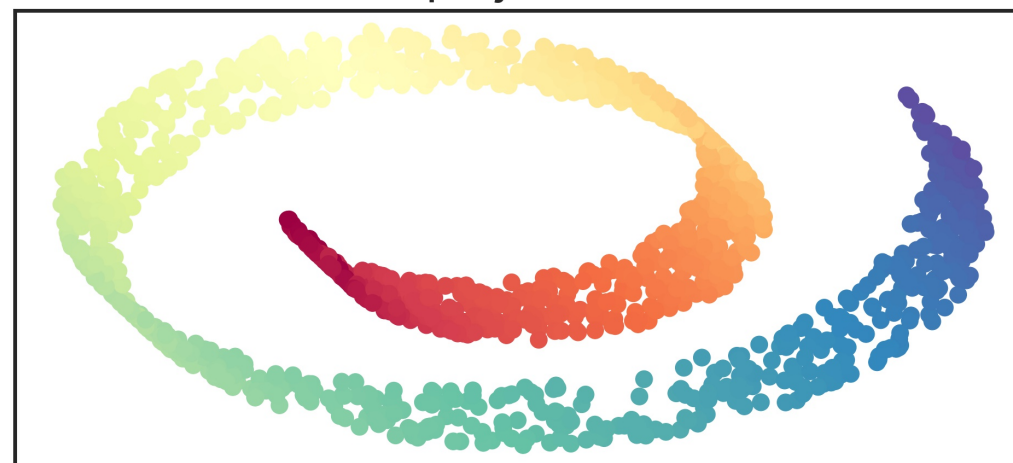
Unravelling the Swiss Roll - Linear



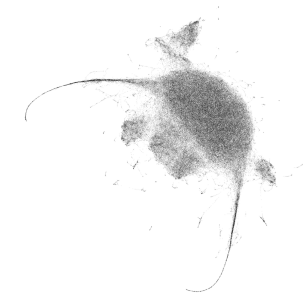
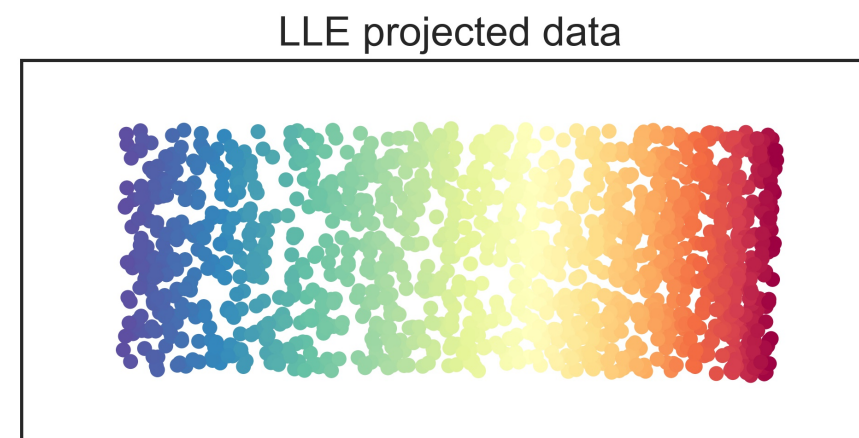
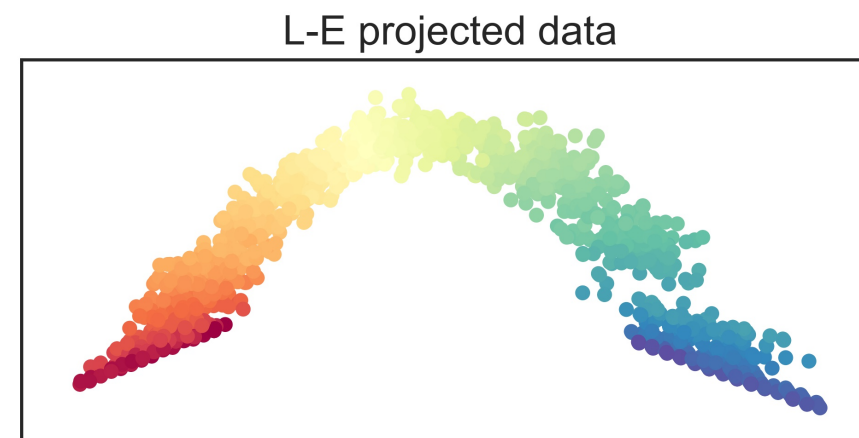
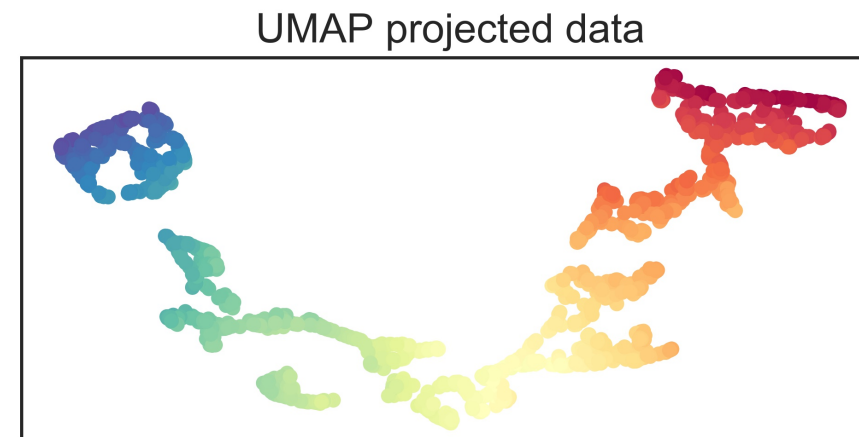
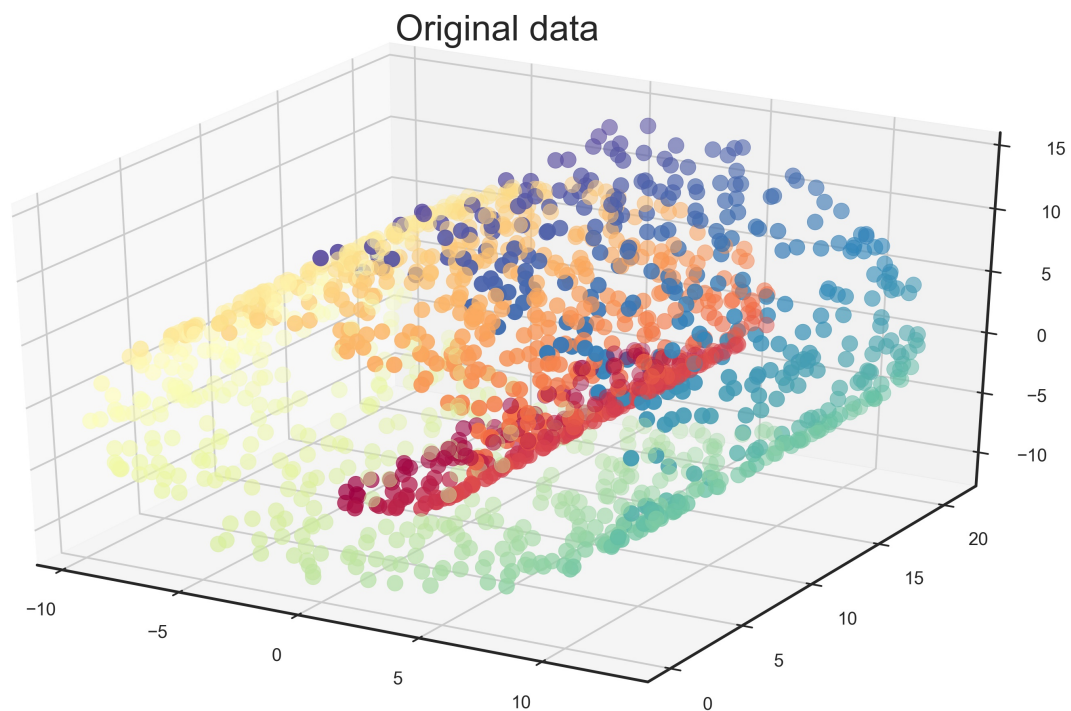
ICA projected data

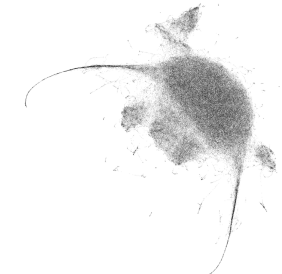


PCA projected data



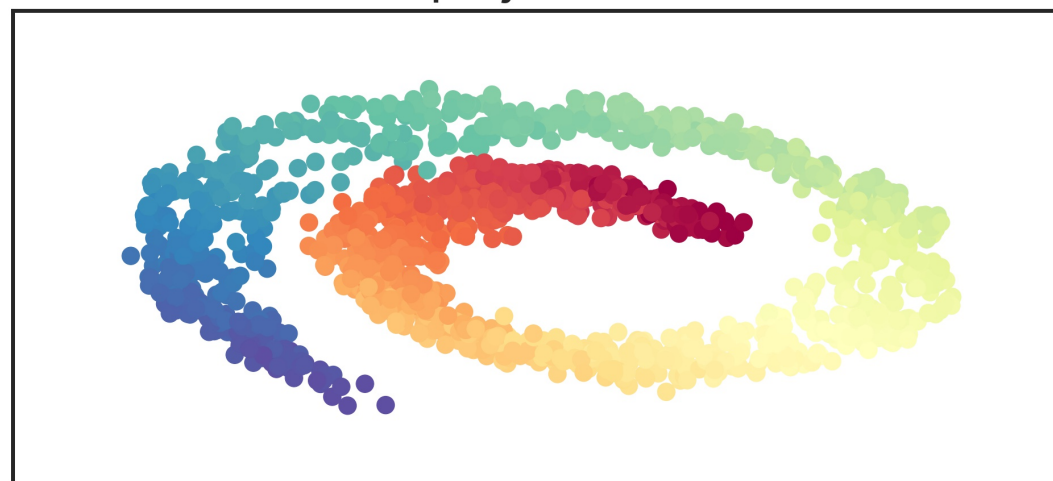
Unravelling the Swiss Roll Non-Linear



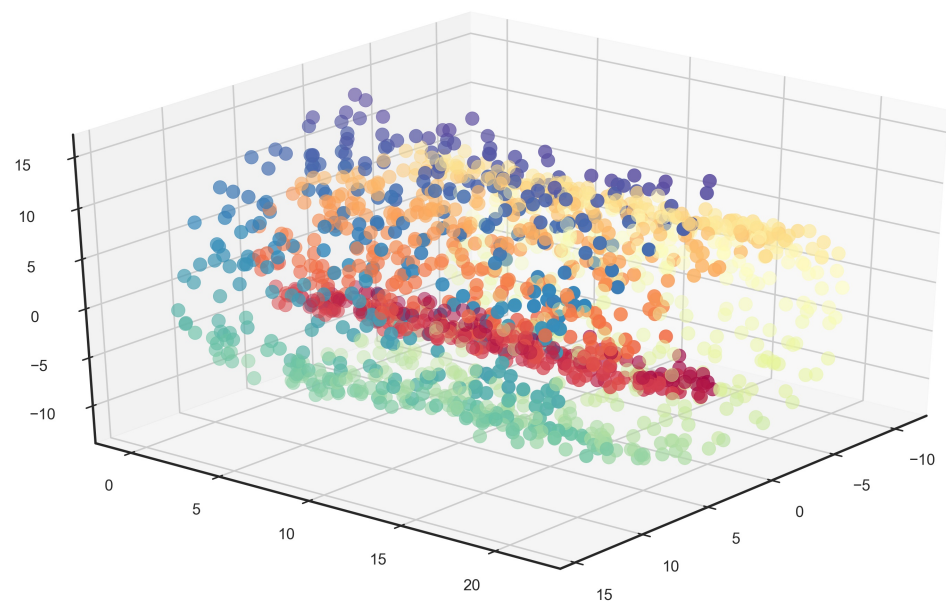
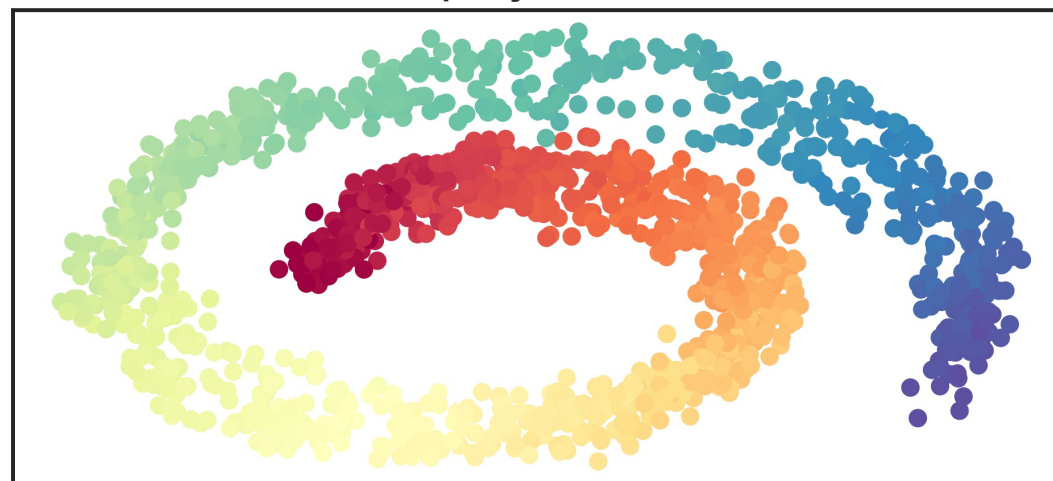


Introducing Noise - Linear

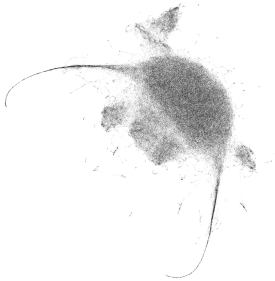
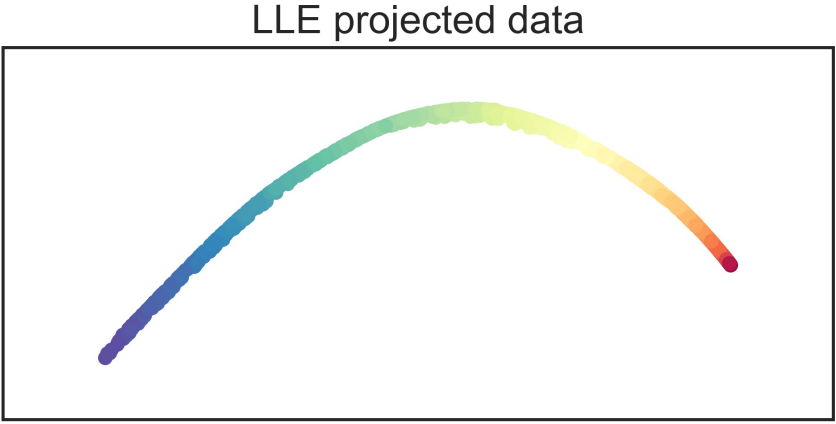
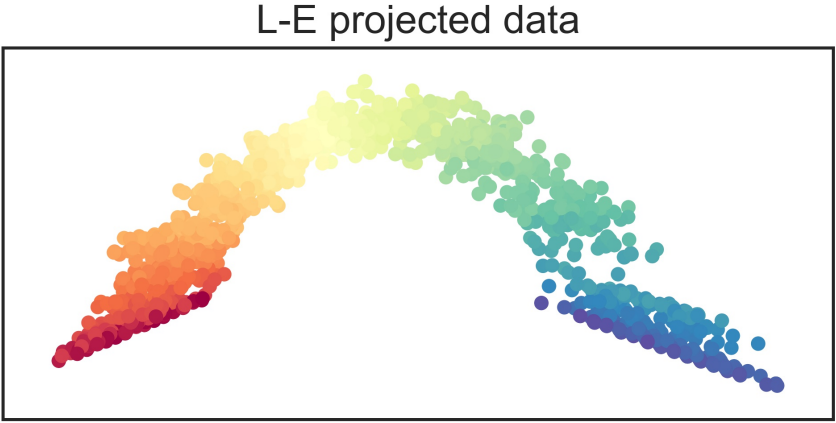
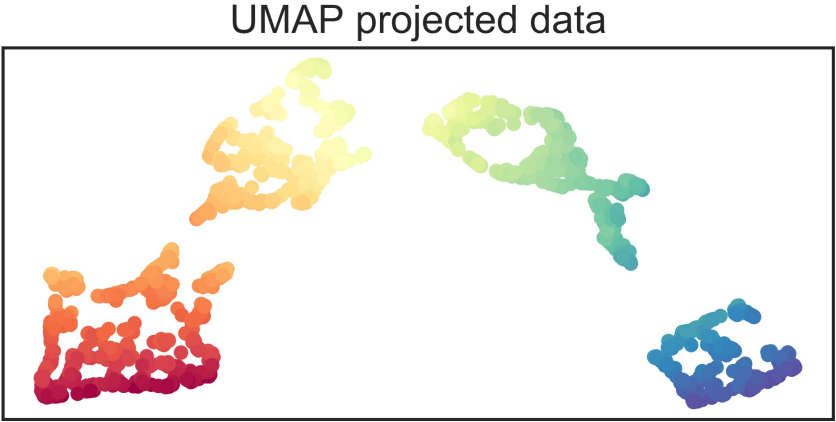
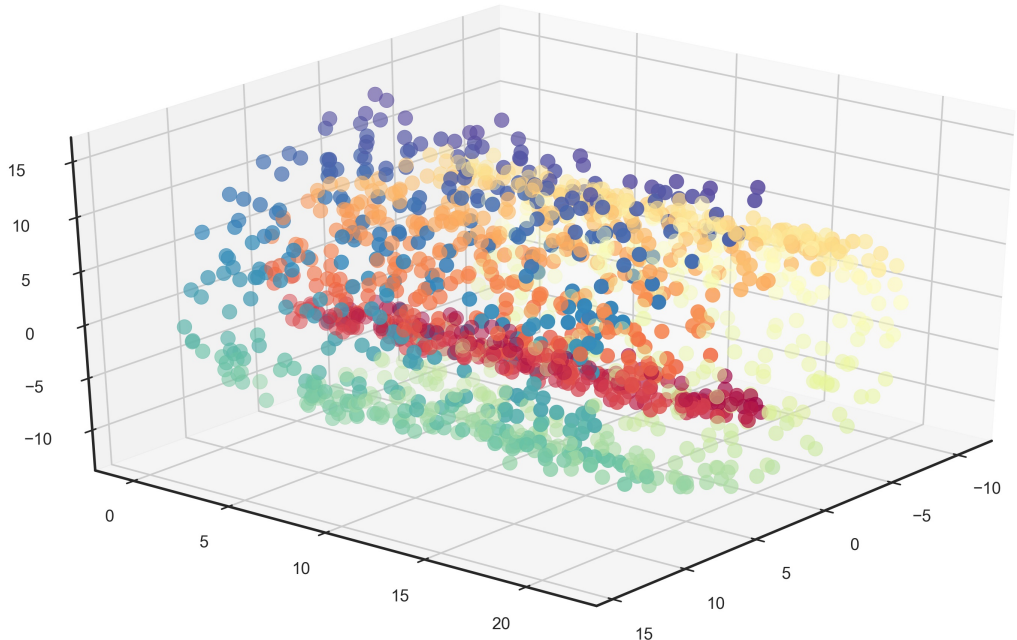
ICA projected data



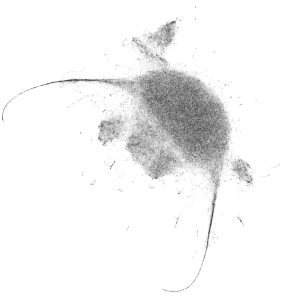
PCA projected data

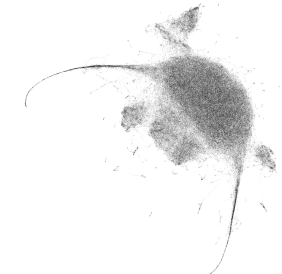


Introducing Noise Non-Linear

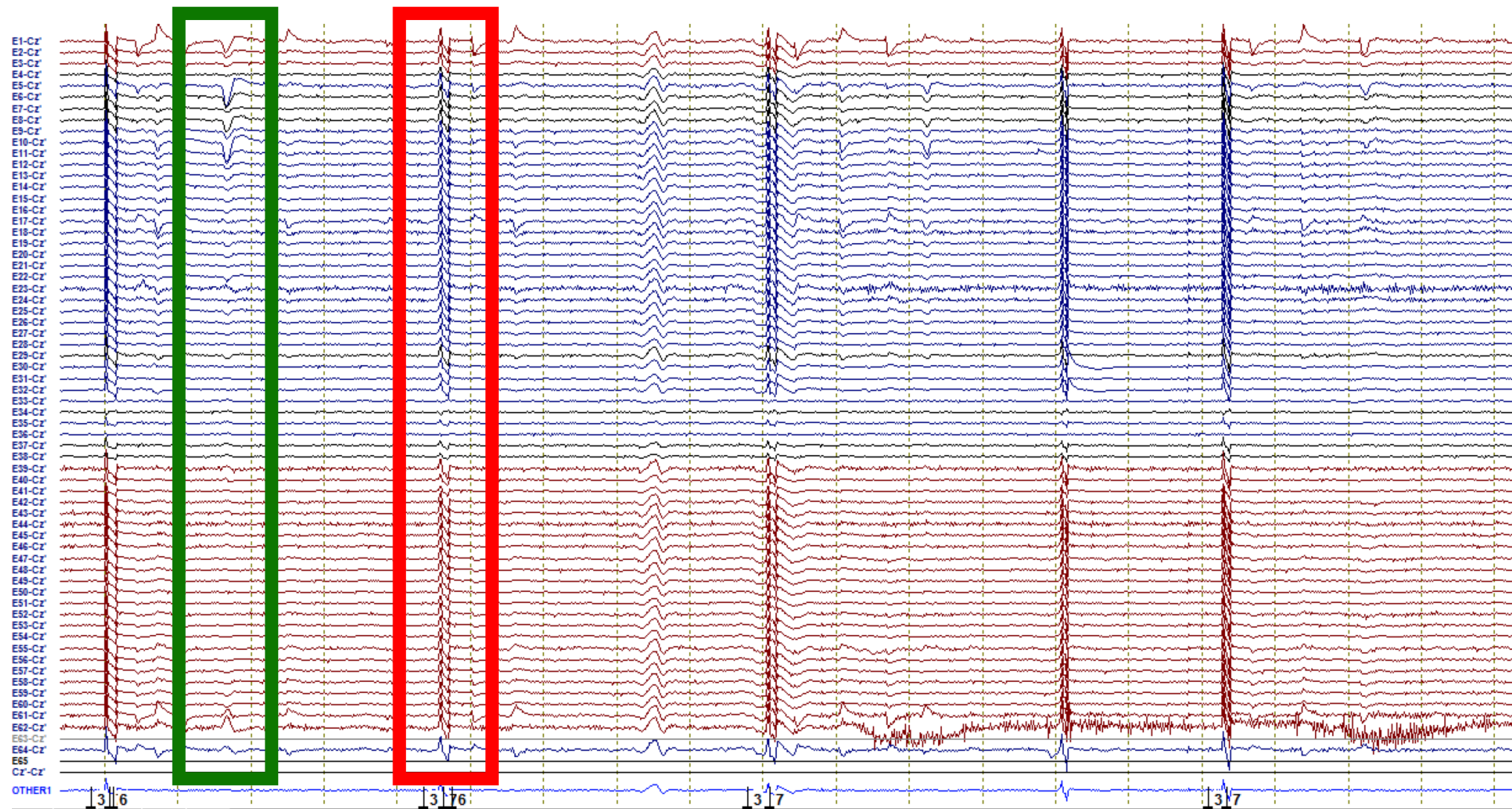


EEG Hyperscanning



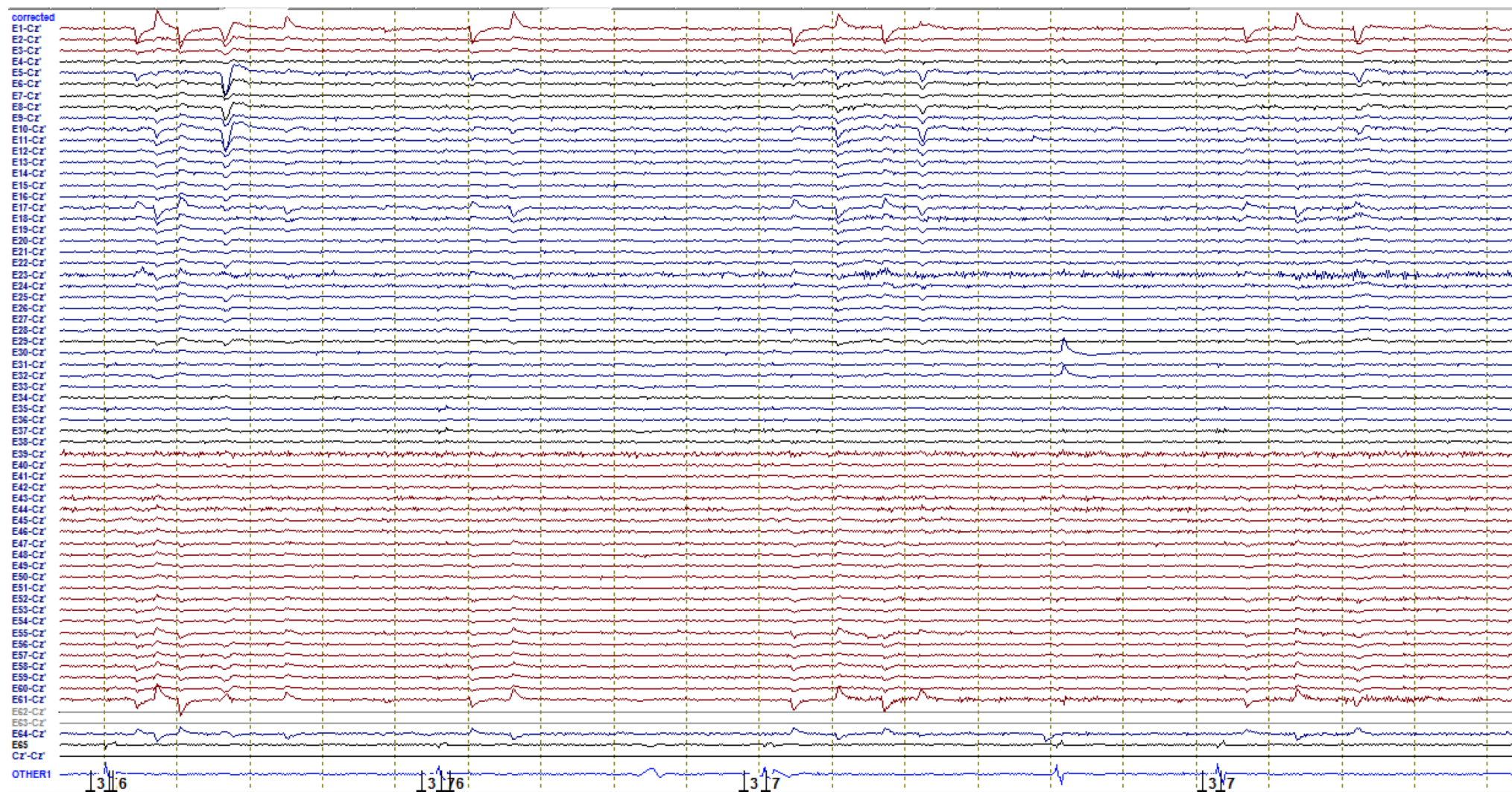


RAW EEG data

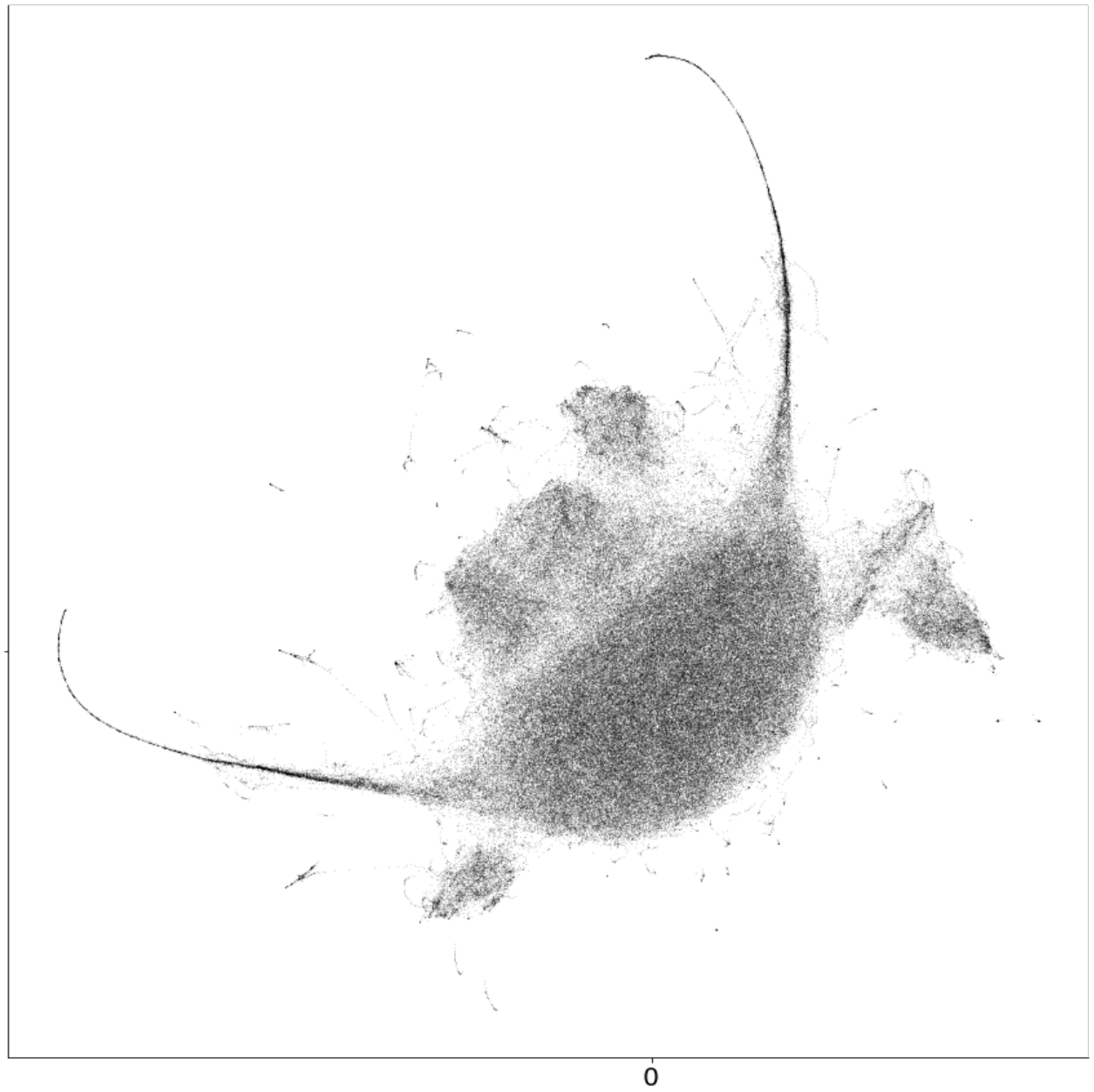
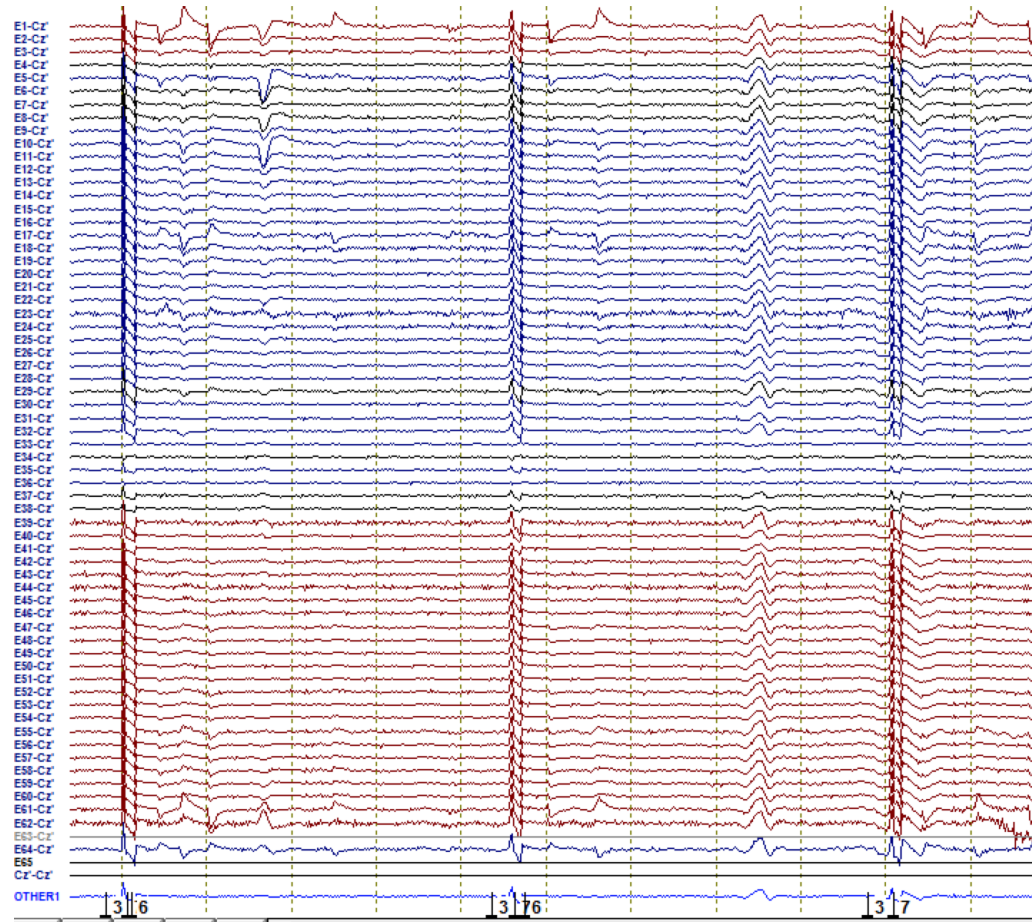




Using ICA to Detect the Button Press Artifact

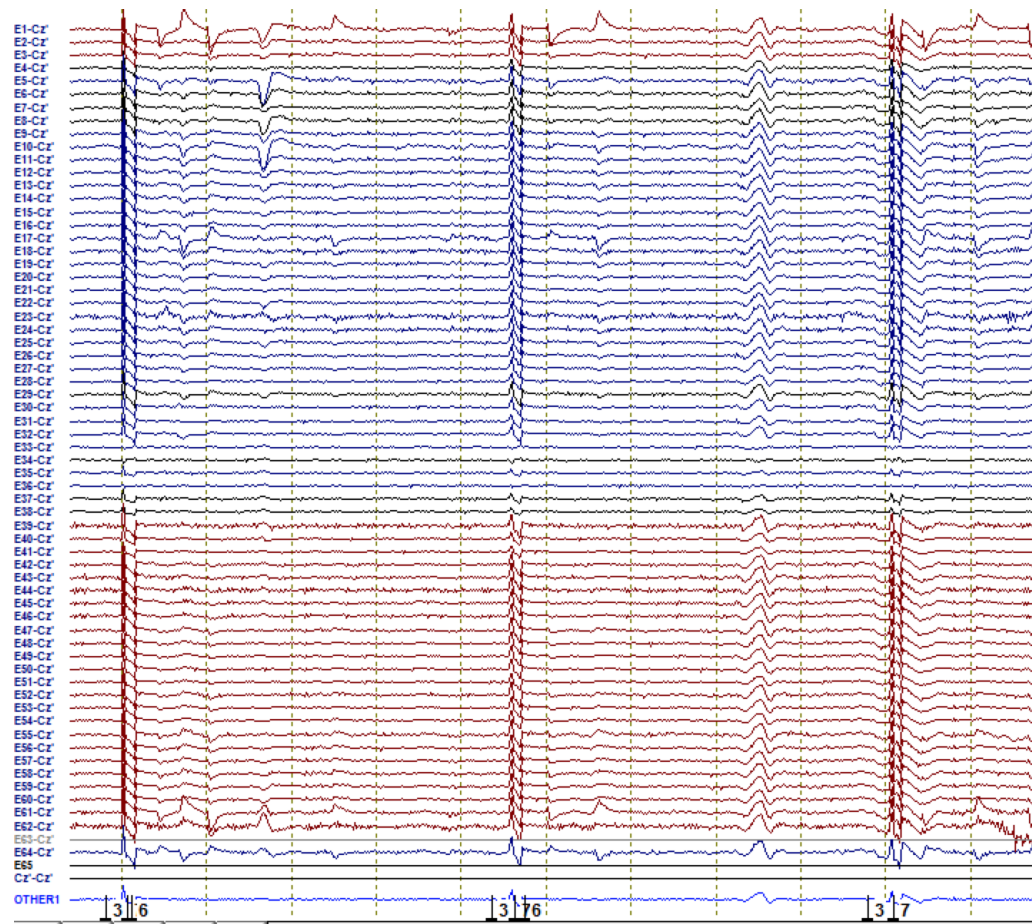


Using UMAP to Identify Artifacts

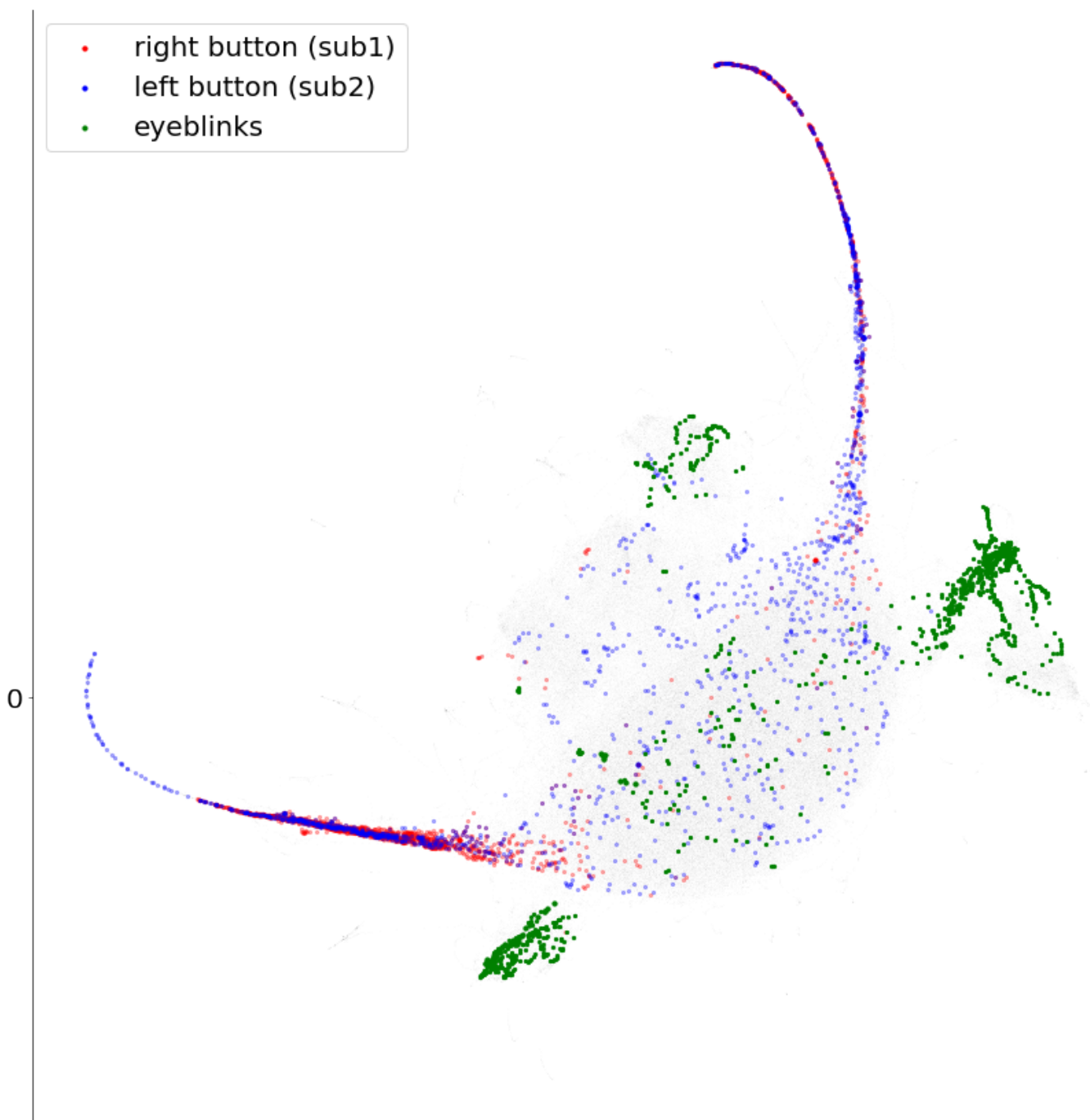




Using UMAP to Identify Artifacts



- right button (sub1)
- left button (sub2)
- eyeblinks



THANK YOU

