Selected Topics in Biomedical Signal Processing

Author 1 Author 2

Date

1 Data-driven filter design for biomedical sensor arrays

Unsupervised artifact removal using CCA

The raw EEG data is shown in Figure.1. In Figure.2, the eye-blink artifacts can be seen at $t = 0s, 2.5s, 4.8s, 7.2s$.

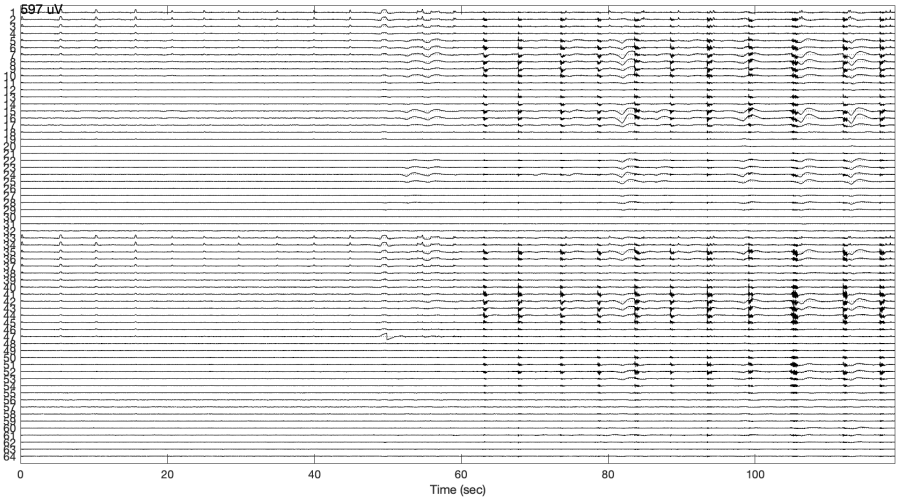


Figure 1: Raw EEG data

The magnitude of the eye-blink artifacts differs from channel to channel. This is cause by the different locations of the electrodes.

The reconstruction can be done by setting the sources with lower autocorrelation to 0.

Supervised artifact removal using MWF

2 Blind Signal Separation

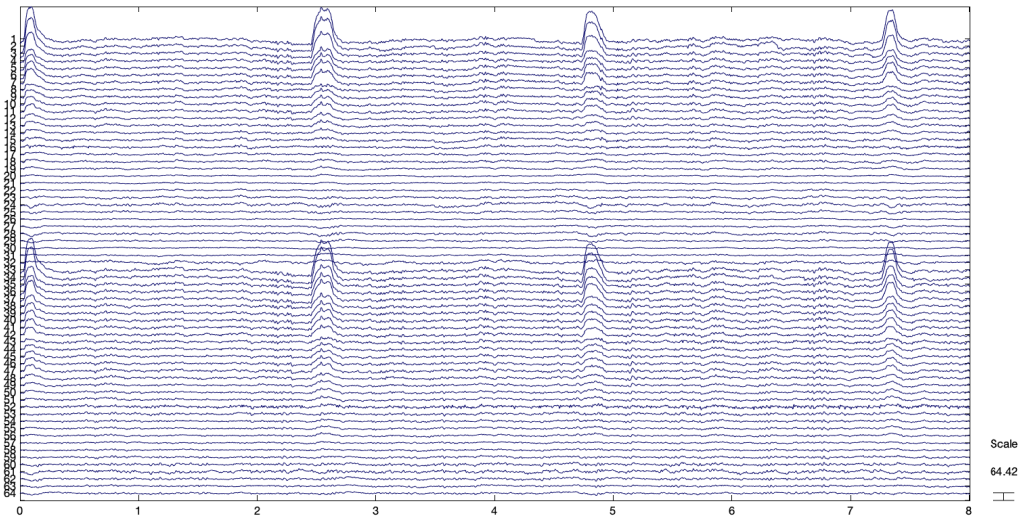
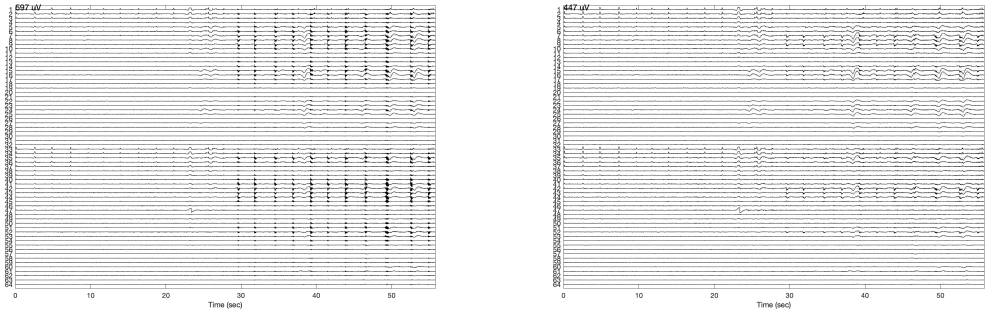


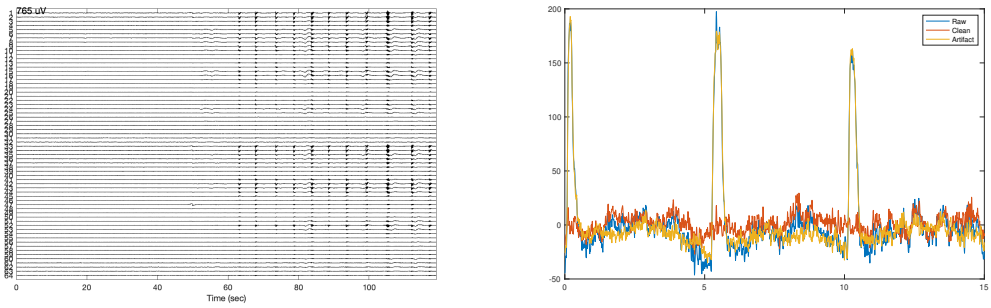
Figure 2: Eye-blink artifacts



(a) Raw EEG data

(b) Muscle artifact removed

Figure 3: Artifact removel with CCA



(a) Eye-blink artifact removal

(b) Artifacts removal on Ch3, zoomed in

Figure 4: Eye-blink artifacts removal with MWF

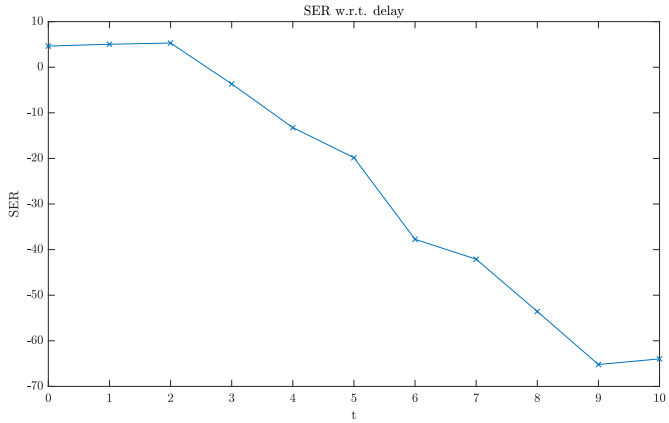


Figure 5: SER under different time delay