Reconstructing attended speech from the brain

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Not a lot is known about the remarkable ability of humans to separate a single sound source from a dense mixture of sound sources in a crowded background, the ***cocktail-party scenario***. More knowledge could lead to a breakthrough for the next-generation hearing aids to have the ability to be cognitively controlled. However, a key that helped the field to progress is that human brain activity follows the sound envelope. The aim of this project is to investigate if ***robust time-frequency estimation*** can be used to accurately 'reconstruct' speech from the recorded brain responses and identify the sound source of the listener's interest.

There are two different available datasets. The first dataset contains recordings of 30 subjects, where were instructed to attend to a specific sound source, on either the left or right side during the entire experiment. The second dataset contains recordings of 30 subjects, where the subjects were instructed to switch their attention from one sound source to another during the experiment. The project is performed in close collaboration with Eriksholm Research Centre, Oticon A/S, Denmark.

Prerequisites:
Mathematical Statistics
Digital Signal Processing
Modeling and Learning for Dynamical Systems

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