Master Thesis Proposal

**Background:** Natural listening situations that require listeners to selectively attend to a talker of interest in noisy environments with multiple competing talkers are among the most challenging situations encountered by hearing impaired listeners. Such challenges become even more pronounced with increasing background noise level and may partially be overcome by adequate hearing aid amplification and noise reduction support. A key finding that helped the field to progress is that speech-evoked brain responses recorded with EEG/MEG are modulated by listener’s auditory attention, revealing selective tracking of the target talker. A noise reduction scheme in commercial hearing aids was also found to support auditory attention in hearing impaired brain. However, what is not known is was how different adaptive amplification and noise reduction strategies affect auditory attention in distinct hierarchical stages of the brain.

**Project description:** The goal of the master’s thesis is to answer this question using forward modeling (causal FIR model). This knowledge will give a deeper understanding of the effects of hearing impairment on auditory attention which is needed in order to further advance hearing aids.

**Method:** The datasets will be provided by Eriksholm Research Centre (part of the world-leading HA manufacturer Oticon A/S). The dataset contains EEG data collected from 35 participants fitted with hearing aids in which two different adaptive amplification and NR strategies were implemented. The participants were instructed to attend to one of two simultaneous talkers in the foreground mixed with multi-talker babble noise in the background.

**Relevant Literature:**


