

## Proposal for a Research Internship

**Topic:** Implementation of a Real-Time Demonstrator for Blind Source Extraction

**Description:** *Blind Source Extraction* (BSE) refers to the problem of extracting a target signal from a measured mixture of unknown source signals. In particular, scenarios with more sources than sensors have proven to remain challenging. To deal with these overdetermined scenarios various algorithms have been proposed.

One approach for dealing with the convolutive BSE task is called *geometrically-constrained TRINICON* (GC-TRINICON) [1]. It models statistically independent source signals and adds geometric constraints to infer a noise estimate. Based on this estimate time-variant noise reduction filters are estimated to reconstruct the target component.

The goal of the research internship is to implement a real-time BSE demonstrator based on an existing C++ implementation of GC-TRINICON in Matlab. A graphical user interface for controlling the algorithm and a hardware-interface have to be implemented. Subsequently, the demonstrator should be merged with an existing Blind Source Separation demonstrator. Finally, different parameter settings of the algorithm should be examined with respect to real-time performance and audio impression.

As prerequisites, the student should have strong Matlab programming skills. In particular, experience with GUI-programming, playrec and MEX-files is welcome.

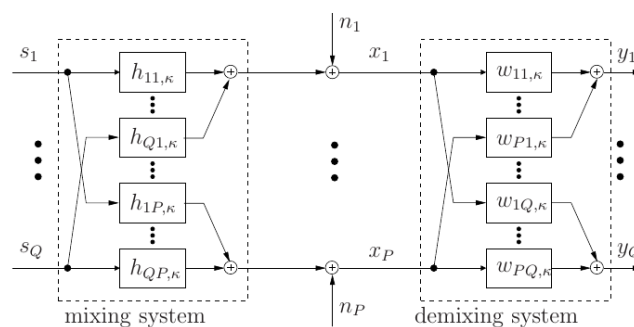


Figure 1: Convolutive mixing and demixing model

[1]: Reindl, K., Meier, S., Barfuss, H., Kellermann, W.: *Minimum Mutual Information-Based Linearly Constrained Broadband Signal Extraction*, IEEE Audio, Speech, Language Process., vol. 22, no. 6, pp. 1096-1108, June 2014.

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**Available:** Immediately