

# Recent Progress on Dimensionality Reduction Methods for Signal Detection

Sara Krause-Solberg

Fachbereich Mathematik, Universität Hamburg

## ABSTRACT

Many relevant applications in signal detection rely on the separation of sources from a mixture of signals without a prior knowledge about the mixing process. Given a mixture of signals  $f = \sum_i f_i$ , the task of signal separation/detection is to estimate the components  $f_i$  using specific assumptions on their time-frequency behavior or statistical characteristics. To this end, *independent subspace analysis* (ISA) reduces the embedding dimension of the time-frequency representation of  $f$  prior to the application of independent component analysis (ICA). But other non statistic-based methods, such as non-negative matrix factorization (NNMF), seem to be promising as well.

This talk gives a short overview on dimensionality reduction tools in signal separation including principal component analysis (PCA), Laplacian eigenmaps (LE) and isomap, where we show some ideas how NNMF could be included in the concept of ISA.