

The Reconstruction of non-stationary signals by the generalized Prony method

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In [1] Peter & Plonka derived a generalized Prony method for the reconstruction of sparse expansions of eigenfunctions of suitable linear operators using only a small number of suitable sample values. Although some examples were given by Peter & Plonka the problem of finding such operators is non-trivial.

In this talk we look at different generalizations of shift operators and their corresponding sets of eigenfunctions and eigenvalues that admit a reconstruction of structured functions from function values. In particular, we present a way to use these operators in order to reconstruct signal models such as arbitrary linear combinations of Gaussians, Gabor expansions with a Gaussian window as well as non-stationary trigonometric expansions with a special monotone phase function via the generalized Prony method.

Joint work with: Gerlind Plonka (University of Goettingen), Kilian Stampfer (University of Goettingen).

References

- [1] G. Plonka and T. Peter. *A generalized Prony method for reconstruction of sparse sums of eigenfunctions of linear operators*. Inverse Problems 29, 025001,2013.
- [2] K.Stampfer, G.Plonka and I.Keller *Reconstruction of stationary and non-stationary signals by the generalized Prony method* Analysis and Applications, to appear, 2018.