ALPEN-ADRIA UNIVERSITÄT KLAGENFURT

Invitation to the Doctoral Seminar

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"Para hermitian Eigenvalue Decomposition and application to broadband multichannel problems"

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Abstract
The analysis and design of broadband multichannel systems typically involves convolutive mixing, characterised by matrices of transfer functions. Further, many broadband multichannel problems can be formulated using cross spectral density matrices (in the frequency domain) or space-time covariance matrices that include an explicit lag variable and thus cross-correlation sequences as entries. This is in contrast to narrowband challenges, where the problem formulation relies on scalar matrices; a rich set of solutions that are optimal in various senses can be reached from these formulations by matrix factorisations such as the eigenvalue or singular value decompositions. In order to extend the utility of such linear algebraic techniques to the broadband case, the diagonalisation or factorisation of matrices of functions is key. In this presentation, I will show that such matrices are quite ubiquitous in multichannel signal processing, review some of the theory for their factorisations, and show how with such techniques broadband formulations and solutions directly generalise from their

narrowband counterparts. I will sketch out a number of algorithms and illustrate their use in a few example applications such as beamforming.

Daniel Brosch and the Department of Mathematics look forward to seeing you at the talk!