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SEMINAR OF NUMERICAL ANALYSIS

> **WEDNESDAY 27 FEBRUARY 2013 - ROOM CH B3 31 - 16h15**

Dr. Matthias HEIN, *(Saarland University, Saarbruecken, Germany)* will present a seminar entitled:

"Nonlinear eigenproblems and tight relaxations of constrained fractional set programs"

Abstract:

It turns out that many problems in data analysis and beyond have natural formulations as nonlinear eigenproblems. In this talk I present our recent line of research in this area. This includes the efficient computation of nonlinear eigenvectors via a generalization of the inverse power method and a general result showing that a certain class of NP-hard combinatorial problems such as balanced graph cuts have tight relaxations into nonlinear eigenproblems. In the case of the Cheeger cut this corresponds to the second eigenvector of the p-graph Laplacian for p=1.
A generalization of this result to constrained fractional set programs with applications in local clustering and community detection will be discussed. Empirically, we outperform loose spectral/convex relaxations often by large margin.

Lausanne, 22 February 2013/DK/cr
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