Lothar-Collatz-Kolloquium für Angewandte Mathematik

Donnerstag, den 11. April 2024, um 17:15 Uhr, im Hörsaal 5

Prof. Dr. Martin Skovgaard Andersen*
(DTU Danmarks Tekniske Universitet, Dept. of Applied Mathematics and Computer Science)

"Optimization with rank-structured matrices"

Zusammenfassung/Abstract:

Simple optimization methods commonly suffer from slow convergence near a minimizer, and yet such methods are often a de facto choice when dealing with large-scale problems with a large number of variables and/or large quantities of data. This talk presents some examples of how this issue can be addressed using rank-structured matrices as building blocks. Such matrices have a low-rank structure that admits a storage-efficient representation and fast algebraic operations (e.g., matrix-vector multiplication, factorization, etc.), and they arise frequently in engineering and data science, e.g., in applications that involve kernel functions. Examples include semiseparable (SS), hierarchical off-diagonal low rank (HODLR), and hierarchical semiseparable (HSS) matrices, all of which allow for linear or quasi-linear time and space complexity in key operations.

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