KO-MIX

Interní seminář pracovníků KMD

Srdečně zveme pracovníky KMD, KAP a další zájemce z řad veřejnosti
na přednášku pořádanou v rámci odborného semináře *KO-MIX*

On a Sparse Representation of an n-dimensional Laplacian in Wavelet Coordinates

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(KMD, FP TU v Liberci)

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Abstrakt přednášky:

Important parts of adaptive wavelet methods are well-conditioned wavelet stiffness matrices and an efficient approximate multiplication of quasi- sparse stiffness matrices with vectors in wavelet coordinates. Therefore it is useful to develop a well-conditioned wavelet basis with respect to which both the mass and stiffness matrices are sparse in the sense that the number of nonzero elements in each column is bounded by a constant. Consequently, the stiffness matrix corresponding to the n-dimensional Laplacian in the tensor product wavelet basis is also sparse. Then a matrix-vector multiplication can be performed exactly with linear complexity. In this paper, we construct a wavelet basis based on Hermite cubic splines with respect to which both the mass matrix and the stiffness matrix corresponding to a one-dimensional Poisson equation are sparse. Moreover, a proposed basis is well-conditioned on low decomposition levels. Small condition numbers for low decomposition levels and a sparse structure of stiffness matrices are kept for any well-conditioned second order partial differential equations with constant coefficients; furthermore, they are independent of the space dimension.

Za organizátory semináře srdečně zve

RNDr. Václav Finěk, Ph.D.