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Risi Kondor* (risi@cs.uchicago.edu). *Multiresolution Matrix Factorization*.

The common thread in Multiresolution Analysis, Fast Multipole Methods, Multigrid, and Structured Matrices is that they all exploit structure (specifically, hierarchical structure) in the underlying domain to speed up computations. In Statistical and Machine Learning problems these methods have had less influence, because the underlying structure is less apparent.

In this talk we describe Multiresolution Matrix Factorization (MMF), which reinterprets Orthogonal Multiresolution Analysis as a matrix operation, and hence generalizes it to almost any finite space whose metric structure can be described by a symmetric matrix. We show that MMF can be successfully applied in a range of practical tasks from matrix compression to preconditioning large linear systems. The work presented in this talk is joint with Nedelina Teneva and Pramod K Mudrakarta. (Received August 18, 2015)