Matrix Computations and Scientific Computing Seminar

Organizer: Jim Demmel and Ming Gu

Wednesday, 12:10–1:00 pm, 380 Soda Hall

Nov 12 **Jiawang Nie**, UC San Diego

Generating Polynomials and Symmetric Tensor Decompositions

Symmetric tensors are multi-indexed arrays whose entries are invariant with respect to permutations of multi-indices. Generating polynomials are linear relations of recursive patterns about tensor entries. A set of all generating polynomials can be represented by a matrix, which is called a generating matrix. Generally, a symmetric tensor decomposition can be uniquely determined by a generating matrix. We characterize the sets of such generating matrices and investigate their properties (e.g., the existence, dimensions, nondefectiveness). Using these properties, we propose computational methods for symmetric tensor decompositions. Extensive examples are shown to demonstrate their efficiency.