DEPARTMENT OF MATHEMATICAL SCIENCES

Discrete Mathematics Seminar

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Title: Multi-subspace power method for decomposing partially symmetric tensors

Abstract: We present an algorithm for low rank decomposition of tensors of any symmetry type, from fully asymmetric to fully symmetric. It recovers the decomposition one summand at a time via the higher-order power method. This approach is known to fail in general: there need not be a relationship between the summands of a decomposition and the (partially symmetric) singular vector tuples (pSVTs) of the tensor. Our approach overcomes this problem by transforming the input to a tensor with orthonormal slices, via orthogonalization of a flattening. The summands of the decomposition of the original tensor can be recovered from the pSVTs of this new transformed tensor. We introduce a shifted power method for computing pSVTs and prove its global convergence. Numerical experiments demonstrate that our algorithm achieves higher accuracy and faster runtime than existing methods.

Monday, November 9

1:00 – 1:50 pm

Olin Hall 218

WPI