Matrix Computations & Scientific Computing Seminar

Organizer(s): James Demmel, Ming Gu & Beresford Parlett

Wednesday, 11:00am–12:00pm, 380 Soda

Nov. 4 **Prof. Eugene Tyrtyshnikov**, Institute of Numerical Mathematics, Russian Academy of Sciences

Tensor approximation tools free of the curse of dimensionality

Even "simple" case in higher dimensions may require data elements as many as atoms in the universe. Structure in data in such case is the key issue. However, existing tenosr reprentations suffer from various drawbacks. We propose new tensor decompositions called TENSOR-TRAIN DECOMPOSITIONS and the corresponding numerical algorithms with then complexity linear in the number of axes. Applications include interpolation of multi-variate functions, computation of multi-dimensional integrals, solving PDEs, fast inversion of tensor structured matrices etc.