

NUMERICAL ANALYSIS AND SCIENTIFIC COMPUTING
SEMINAR

*A Step in the Right Dimension: Tensor Algebra and
Applications*

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Abstract: As data have become more complex to reflect multi-way relationships in the real world, tensors have become essential to reveal latent content in multidimensional data. In this talk, we will focus on a tensor framework based on the M-product, a general class of tensor-tensor products which imposes algebraic structure in a high-dimensional space (Kilmer and Martin, 2011; Kernfeld et al., 2015). The induced M-product algebra inherits matrix-mimetic properties and offers provably optimal, compressed representations. To demonstrate the efficacy of working in an algebraic tensor framework, we will explore two applications: classifying data using tensor neural networks and forming sparse representations using tensor dictionaries.

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