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Computational Mathematics Seminar Series

Generating Polynomial Method for Non-symmetric Tensor Decomposition**Zequn Zheng, Louisiana State University**

Postdoctoral Researcher

Digital Media Center 1034
September 26, 2023 - 03:30 pm**Abstract:**

Tensors or multidimensional arrays are higher order generalizations of matrices. They are natural structures for expressing data that have inherent higher order structures. Tensor decompositions play an important role in learning those hidden structures. There exist both optimization-based methods and algebraic methods for the tensor decomposition problem, optimization-based methods regard the tensor decomposition problem as a nonconvex optimization problem and apply optimization methods to solve it. Hence, they usually suffer from local minimum and may not be able to find a satisfactory tensor decomposition. Algebraic methods usually require the tensor rank to be not too large and the running time is not so satisfying for large tensors.

In this talk, we present a novel algorithm to find the tensor decompositions utilizing generating polynomials. Under some conditions on the tensor's rank, we prove that the exact tensor decomposition can be found by our algorithm. Numerical examples successfully demonstrate the robustness and efficiency of our algorithm.

Speaker's Bio:

Zequn Zheng is a Postdoctoral Researcher in the Mathematics Department at Louisiana State University. His current research includes optimization, tensor computation, and their applications in machine learning and data science. Prior to joining LSU, he obtained Ph.D. in mathematics from UC San Diego, where he conducted research in data science and tensor computation.

This lecture has refreshments @ 03:00 pm