

Randomized Kaczmarz for Tensor Systems

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When data is large-scale, techniques such as the Randomized Kaczmarz algorithm and Randomized Gauss-Seidel algorithm are advantageous for solving linear systems of the form $Ax = y$. In this talk, we discuss an extension of the Randomized Kaczmarz algorithm to the setting where large-scale data takes on the form of a multidimensional array. Traditionally, multi-dimensional data, i.e., data in the form of high dimensional tensors, are often unfolded to be treated as a matrix-vector problem. In this work, we seek to preserve the tensor structure of the input data and provide theoretical guarantees for recovering underlying, unknown tensors from linear measurements using a tensorized version of the Randomized Kaczmarz algorithm.