

Randomized Kaczmarz algorithms: Accelerated and Asynchronous

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joint work with Ji Liu

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The randomized Kaczmarz method is a basic iterative method for solving systems of linear equalities and inequalities. We discuss two extensions of this approach. The first is an accelerated version for consistent linear equalities, together with an implementation suitable for sparse matrices. The second is an asynchronous parallel variant, drawing on techniques used in the analysis of the asynchronous HogWild! algorithm for parallel stochastic gradient methods.

This work was directly inspired by the paper of D. Leventhal and A. S. Lewis, “Randomized methods for linear constraints: Convergence rates and conditioning,” *Mathematics of Operations Research*, 2010.