

From Kaczmarz algorithm to potential theory

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Abstract

The Kaczmarz algorithm is an iterative algorithm to solve overdetermined linear systems. We will investigate in a randomized version of it and analyze the recovery error in the mean square sense and in the almost sure sense. The question of which probability distributions on a random fusion frame lead to provably fast convergence is addressed. In particular, it is proven which distributions give minimal Kaczmarz bounds, and hence give best control on error moment upper bounds arising from Kaczmarz bounds. Uniqueness of the optimal distributions is also addressed.