Kaczmarz methods for the solution of nonlinear ill-posed equations

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Abstract

Abstract: We present novel iterative regularization techniques for the solution of systems of nonlinear ill–posed operator equations. The basic idea consists in considering separately each equation of this system and incorporating a loping strategy. We show well-posedness, stability and convergence. Moreover, we present three applications, an inverse problem related to thermoacoustic tomography, a nonlinear inverse problem for semiconductor equations, and a nonlinear problem in Schlieren tomography. The novel algorithms show robustness, stability, computational efficiency and high accuracy.

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