A Linear-Equations Challenge

Jonathan Barzilai
Dalhousie University
barzilai@dal.ca

Superlinear Convergence

A sequence of vectors x_k in $\Re^n$ converges superlinearly to x^* if $e_k = \|x_k - x^*\| \neq 0$ for all k and $e_{k+1} / e_k \to 0$.

Observation

No known algorithm for solving systems of linear equations converges at a superlinear rate.

Challenge

Prove that a superlinearly convergent algorithm for solving systems of linear equations does not exist or design such an algorithm.

15 August 2016