Inverse-free Newton's Method

Magdalena Nockowska-Rosiak

We present a modification of Newton's method for finding a zero of a multivariable function without an inverse of a matrix in a recurrence. We prove at least quadratic convergence of a Newton-type method avoiding matrix inversion under standard assumptions, and compare modified and classical Newton's methods numerically.

The talk is based on joint work with Marcin Massalski from Lodz University of Technology, [2].

References

[1] J. D. Blanchard, M. Chamberland, Newton's Method Without Division, *Amer. Math. Monthly*, **130**(7) (2023), 606–617.

[2] M. Massalski, M. Nockowska-Rosiak, Inverse-free Newton's method, *J. Appl. Anal. Comput.*, **15**(4) (2025), 2238–2257.

First Author: Magdalena, Nockowska-Rosiak
Affiliation: *Institute of Mathematics, Lodz University of Technology*
Poland
e-mail: magdalena.nockowska@p.lodz.pl