

Solving nonlinear equations with Newton's method

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Abstrak

This brief book on Newton method is a user-oriented guide to algorithms and implementation. In just over 100 pages, it shows, via algorithms in pseudocode, in MATLAB, and with several examples, how one can choose an appropriate Newton-type method for a given problem, diagnose problems, and write an efficient solver or apply one written by others. Solving Nonlinear Equations with Newton's Method contains troubleshooting guides to the major algorithms, their most common failure modes, and the likely causes of failure. It also includes many worked-out examples (available on the SIAM website) in pseudocode and a collection of MATLAB codes, allowing readers to experiment with the algorithms easily and implement them in other languages.

This book is intended to complement Kelley larger book, Iterative Methods for Linear and Nonlinear Equations (SIAM, 1995), which focuses on in-depth treatment of convergence theory, but does not discuss the details of solving particular problems, implementation in any particular language, or evaluating a solver for a given problem.