Algorithms in the Nashlib set in various programming languages – Index

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Contents

Abstract

This is an index to the other documents in this collection.

Overview of this document

This section is repeated for each of the parts of Nashlib documentation.

A companion document **Overview of Nashlib and its Implementations** describes the process and computing environments for the implementation of Nashlib algorithms. This document gives comments and/or details relating to implementations of the algorithms themselves.

Note that some discussion of the reasoning behind certain choices in algorithms or implementations are given in the Overview document.

File: NashlibAlgorithms-1

Algorithms 1 and 2 – one-sided SVD and least squares solution

Algorithm 3 – Givens' decomposition

Algorithm 4 – Row-oriented SVD and least squares solution

Algorithms 5 and 6 – Gaussian elimination and back-solution

Algorithms 7 and 8 – Choleski decomposition and back-solution

Algorithm 9 – Bauer-Reinsch matrix inversion

File: NashlibAlgorithms-2 – symmetric matrix eigenproblems

Algorithm 10 – Inverse iteration via Gaussian elimination

Algorithm 13 – Eigensolutions of a symmetric matrix via SVD

Algorithm 14 – Jacobi symmetric matrix eigensolutions

Algorithm 15 - Generalized symmetric eigenproblem

File: NashlibAlgorithms-3 – rootfinding and function minimisation

Algorithm 16 – Grid search

Algorithm 17 – Minimize a function of one parameter

Algorithm 18 – Roots of a function of one parameter

Algorithm 19 and 20 – Nelder-Mead search and Axial search check

Algorithm 21 – Variable metric function minimization

Algorithm 22 – Conjugate gradients function minimization

Algorithm 23 – Marquardt nonlinear least squares procedure

Algorithm 27 – Hooke and Jeeves pattern search minimization

Algorithm 26 was added in Nash (1990).

File: NashlibAlgorithms-4 – iterative methods for linear algebra

Algorithm 24 – conjugate gradients for linear equations and least squares

Algorithm 25 – Rayleight quotient minimization

Algorithms added in the 2nd Edition, 1990.

File: NashlibAlgorithms-5 – complex matrices

Algorithm 26 – Complex matrix eigensolutions

Algorithm 26 was added in Nash (1990).

Algorithms 11 and 12 – standardization and residuals for a complex eigensolution

Cleanup of working files and other utilities

References

Nash, John C. 1990. *Compact Numerical Methods for Computers : Linear Algebra and Function Minimisation, Second Edition.* Book. Institute of Physics : Bristol.