

# NAG Toolbox for MATLAB

↘ The NAG Toolbox for MATLAB is the largest and most comprehensive single numerical toolkit that both complements and enhances MATLAB. At Mark 22, the NAG Toolbox for MATLAB contains 1,415 functions that provide solutions to a vast range of mathematical and statistical problems. The functionality contained within this toolbox gives, for the first time, a 'one-stop' solution to your numerical computational needs.

NAG's numerical capabilities have become synonymous with quality and flexibility. There are many reasons for this including; the calibre of the expert contributors from within NAG, academia and industry; the extensive documentation that accompanies all of its software; the stringent verification process to which every algorithm is subject.

↘ **Using the NAG Toolbox for MATLAB strengthens user capability in numerical and statistical areas such as:**

- ▶ Optimization – local and global optimization solvers
- ▶ Ordinary and partial differential equations
- ▶ Wavelet transforms
- ▶ Option pricing
- ▶ Partial least squares and ridge regression
- ▶ Nearest correlation matrix
- ▶ Quantiles
- ▶ Mesh generation
- ▶ Numerical integration
- ▶ Roots of nonlinear equations
- ▶ Dense, banded and sparse linear equations
- ▶ Eigenvalue problems
- ▶ Linear and nonlinear least squares problems
- ▶ Special functions
- ▶ Curve and surface fitting and interpolation
- ▶ Large scale eigenproblems
- ▶ Large, sparse systems of linear equations
- ▶ Random number generation
- ▶ Simple calculations of statistical data
- ▶ Correlation and regression analysis
- ▶ Multivariate methods
- ▶ Analysis of variance and contingency table analysis
- ▶ Time series analysis
- ▶ Nonparametric statistics
- ▶ Copulas – Normal and Student's t
- ▶ Mixed effects regression

“*The NAG Toolbox for MATLAB proved to be very fast and precise both in the solution of nonlinear equations and the inverse Laplace transform. It proved much more reliable than other methods we have tested*”

**Research Department**  
Banco de Portugal

“*I am impressed by the new optimization algorithm in the NAG Toolbox for MATLAB. It improved the results of my maximum likelihood estimations*”

**Research Fellow**  
Finance Research Institute – University of Warwick



## ↘ Key features

### Mathematical and statistical functionality

NAG's collection of world-class numerical functions are organised into 47 chapters, each devoted to a mathematical or statistical area. This makes algorithmic selection extremely easy.

### Detailed documentation

Each function is accompanied by documentation delivered via MATLAB's native help system, or via the web, along with advice on selection of the best algorithm and the interpretation of the results returned.

### Every function has an example program

Each NAG function has an example program to demonstrate how to access it by solving a sample problem. This template can then be easily adapted to reflect your specific problem and help you manage and analyse your data. MATLAB demonstrations are also provided to illustrate the use of NAG functions in more sophisticated applications.

### Quality assured

The validity of each function is tested on each of the machine ranges for which the Toolbox is available. Only when an implementation satisfies our stringent accuracy requirements is it released. As a result you can rely on the proven correctness and reliability of the functions to give you the right answers.



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## Why should I use the NAG Toolbox for MATLAB?

### Increased productivity

NAG Toolbox for MATLAB functions, written by experts in their field, are renowned for correctness, reliability and robustness making them the perfect choice to solve your problem.

### Detailed documentation

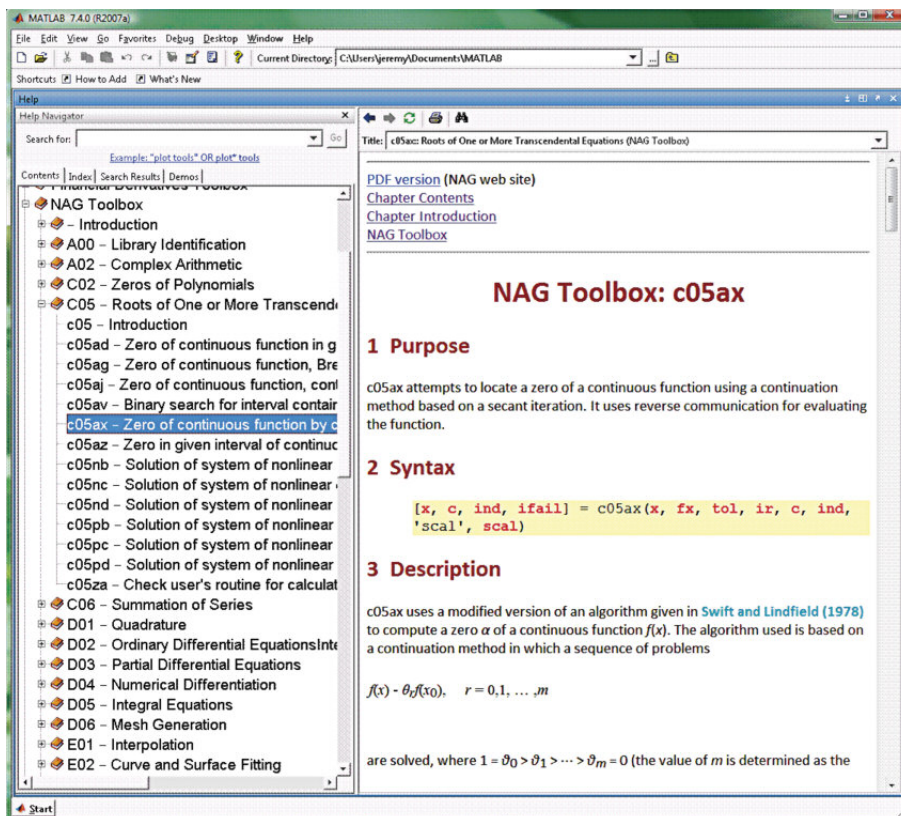
NAG's documentation is renowned for its detail. Included in each NAG Toolbox for MATLAB function document is an example program giving users a template for adaptation to their own problems – a suite of more sophisticated demos are also available heightening user experience.

### Easy to use

The numerical code that displays when using the NAG Toolbox for MATLAB is easy to read and maintain as argument lists are tailored to the MATLAB environment.

### NAG's expert support service

By subscribing to NAG's dedicated in-house Customer Support Service, not only will you receive product updates which includes new and improved algorithmic functionality, but you can contact NAG experts who will assist with your technical queries or difficulties.



Screenshot shows the 'Zero of continuous function' routine introduction in the NAG Toolbox for MATLAB

## Product availability

The NAG Toolbox for MATLAB is available for Linux and Microsoft Windows.

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