

MATLAB Quality Statement

MATLAB® is an extremely popular tool for technical computing, with over 3 million users spread throughout industry, government, and academia. MATLAB is used in a variety of application areas; including signal and image processing, control system design, earth and life sciences, finance and economics, and instrumentation. There are now more than 2000 textbooks in mathematics, physics, statistics, engineering, and biology that incorporate MATLAB programs in the text.

With more than 1800 mathematical, statistical, and engineering functions, MATLAB gives you immediate access to high-performance numerical computing techniques and tools. The numerical routines are fast, accurate, and reliable. These algorithms, developed by experts in mathematics, are the foundation of the MATLAB language. Source code or references are provided for all numerical algorithms. The core math engines incorporate the well-respected LAPACK and BLAS (Basic Linear Algebra Subroutines) linear algebra subroutine libraries and FFTW signal processing library, embedding the state-of-the-art in mathematical computation directly into MATLAB.

In MATLAB, all numeric representations, functions, and operations are calculated using IEEE double-precision, floating-point arithmetic that offers the maximum level of precision provided by the underlying architecture. Algorithms for numeric operations have been carefully selected and coded to guarantee a reasonable number of correct digits as well as the maximum domain of evaluation on most machines. When the software cannot guarantee this predetermined level of accuracy, it is designed to return a missing result rather than a potentially inaccurate result. The algorithms are tested with an extensive suite of automated tests on all supported platforms. Quality and Software Engineers continually test the products throughout each release cycle, with a focus on numerical correctness, code generation accuracy, standards compliance, performance factors, and compatibility.

The MathWorks is committed to delivering quality products to our customers. “Improve product quality, development processes, and tools” has been a Corporate Absolute Priority since 2005. MathWorks follows a development process that incorporates industry best practices, with influences from SEI CMM, ISO 9000, TQM/QA, Six Sigma, lean manufacturing, JIT, Toyota Production System, The Toyota Way, Kaizen, Deming, and Theory of Constraints (TOC). MathWorks has distilled what we found to be the most valuable parts of these methods into an approach for improving our software development process. MathWorks selected the following key tools for use within our development culture, that have provided significant value in improving our development process: Root Cause Analysis-driven process improvement, Fix-as-you-go operating principle (do not pass defects forward to the next stage), and Waste-reduction initiatives.