Visual Numerics
A Rogue Wave Software Company

VERSION 6.0

IMSL®
C# Numerical Library

Advanced Analytics for Microsoft® .NET Applications

"The IMSL C# Library enables us to quickly and efficiently provide advanced data analysis capabilities to SixSigma professionals seamlessly within our SigmaWorks Professional and RiskWizard software solutions. "

Scott Patrias
Software Development Manager
NextSigma, Inc.

"Because the IMSL C# Library is so easy to use, our Chief Engineer was able to rewrite our application in a week. This task would have takeple of months to complete if he rewrote the application himself. More important, using a commercial library freed him up to work on new technology and product development."

Jeff Prevost
Product Development Manager
Injury Sciences

Optimized for
Microsoft Visual Studio .net

High Performance Business Analytics Made Easy

The IMSL C# Numerical Library for Microsoft® .NET Applications is a numerical analysis library written in 100% C#, providing broad coverage of advanced mathematics and statistics for the .NET Framework. Developers writing in C# or Visual Basic™ .NET (VB.NET) get seamless accessibility to analytics capabilities in the most integrated language for the .NET environment with the highest degree of programming productivity and ease of use with Visual Studio™.

The IMSL C# Library is the only numerical library of its kind to offer industry standard numerical analysis and charting for the .NET framework. This Library provides unprecedented analytic capabilities and the most comprehensive and accessible mathematical, statistical and financial algorithms for .NET languages. With the IMSL C# Library, Visual Numerics leveraged all of the benefits inherent in the .NET development framework by adding robust analytics to its broad set of capabilities.

Mathematical, Statistical and Charting Functionality

The algorithms available within the IMSL C# Library cover all of the major categories of functionality commonly used in numerical analysis, from commonly used mathematical and statistical analysis functions such as optimization and regression to advanced neural network and classification technology. By leveraging its pre-built algorithms, users can save weeks or months of development effort by embedding IMSL C# Library functions rather than building new algorithms from scratch.

This functionality can be applied to an unlimited set of applications, such as bioinformatics and life sciences, fraud detection, risk management and portfolio optimization, manufacturing yield analysis and more.

Mathematical Functionality	Statistical Functionality	Charting Functionality	Data Mining Functionality
Linear Systems	Basic and Non-parametric Statistics	Function and Spline	Neural Network Engines
Eigensystem Analysis	Time Series and Forecasting	Line, Pie, Scatter, Bar, and Box	Neural Network Data Pre-processors
Interpolation and Approximation	Tests of Goodness of Fit	Polar, Area, Contour, and Histogram	Naïve Bayes Classification
Nonlinear Equations	Regression	Date and Time Support	...and much more
Optimization	Multivariate Analysis	Fully Interactive Capabilities	
Finance and Bond Calculations	Probability Distribution Functions	High-Low-Close	
Differential Equations	Random Number Generator	Heat Map and Tree Map	
...and much more	...and much more	...and much more	

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WHAT'S NEW IN VERSION 6.0

Improved performance by embedding the Intel® Math Kernel Library

Powerful charting capabilities
- New Tree Map class

New functions

- Data Mining
  - Naïve Bayes for classification problems
- Time Series Analysis
  - AutoARIMA for automatic estimation of ARIMA parameters
  - Outlier Identification
  - Lack-of-Fit Test
- Survival Analysis
  - Life Tables
  - Kaplan-Meier estimates
  - Proportional Hazards
- Other new statistical functions
  - Expanded CDFs and PDFs
  - Random numbers from Copula distributions and Ziggurat method
- Mathematical functions
  - Feynman-Kac PDE
  - Adams-Gear ODE
  - TCB Cubic Splines
  - NumericalDerivatives for Jacobian computation

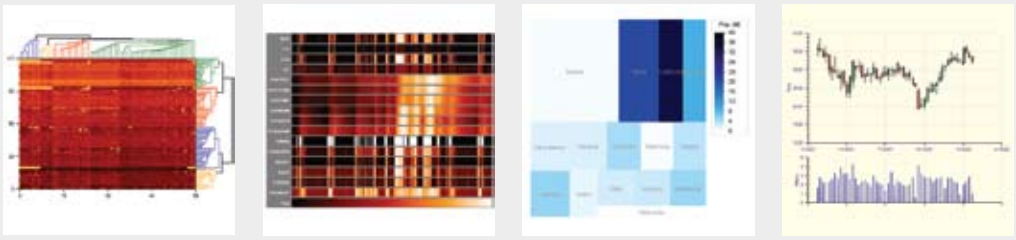
Additional Updates and Enhancements

Improved Performance

With V6.0, IMSL C# Library developers continue to have the option to use a version of the library that embeds the Intel Math Kernel Library (MKL). The number of classes that utilize MKL has been expanded resulting in improved application performance for many tasks including linear algebra and matrix multiply functions.

Powerful Charting Capabilities

The IMSL C# Numerical Library V6.0 offers a new Tree Map class adding to the extensive array of charting types. The chart types range from traditional scatter plots and bar graphs, to statistical process control charts and box plots, to unique types such as dendrogram for hierarchical cluster analysis visualization. Following a flexible object-oriented design, the customizable built-in types are easily embedded in desktop and web applications.



Sample charting types available in IMSL C#: Heat Map, Time Series, Tree Map, and Candlestick

New Functions

IMSL C# version 6.0 has added 27 new classes to its libraries providing unique numerical analysis techniques to customers solving analytic problems in finance, business intelligence, data mining and other areas of business, science and research. With version 6.0:

- Finance customers will benefit from a new Feynman-Kac algorithm that solves Black-Scholes problems, two new least squares optimizers, Random Copula methods, Survival Analysis, Logistic and Pareto distributions
- Business intelligence and data mining software developers can leverage Naïve Bayes for classification and text mining problems. In addition, new classification capabilities in the Neural Network algorithm and new ways to select ARIMA models offer additional classification and forecasting techniques.

Typical Application Areas

Today, major corporations, academic institutions, and research laboratories worldwide use the IMSL C# Library. Example application areas include:

- Risk management in financial services and insurance
- Portfolio optimization in financial services
- Business intelligence extensions for data warehouse software
- Statistical analysis of manufacturing test data
- Inventory management and demand forecasting
- Medical and biological system R&D and modeling

Expert Consulting Services

The highly-skilled technical experts in Visual Numerics' consulting organization collaborate with customers to identify specific application requirements at the initial phase of every project. Visual Numerics' consultants provide all levels of support from custom algorithm development to simply helping customers better understand their analysis and visualization needs. Customers can rely on Visual Numerics' technical expertise and dedicated hands-on help to achieve the highest return on investment.

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