JMSL™ Numerical Library

JMSL Numerical Library for Java™ Applications
The Leader in Java Numerical Analysis

KEY ADVANTAGES

- **Robust Numerical Analysis on the Java Platform** – The only comprehensive 100% Java Numerics solution with extended language capability

- **Reliable** - Based on the industry-standard IMSL Library algorithms with over 30 years experience in numerical analysis

- **Comprehensive Java Library** with broad algorithm coverage combined with charting capabilities

- **Quick Start-up** – Mainstream language, non-proprietary environment, code examples for quick idea generation

- **Flexible** – Platform independent (no porting issues); easy to embed in existing, standalone or networked applications

- **Cost Effective** – Saves time for development efforts, Q/A and support

- **Faster Development Cycle than Home Grown** – Up to 95% savings

The only comprehensive, 100% Java™ numerical analysis package is now even more powerful. The JMSL™ Numerical Library Version 3.0 provides a fast, scalable framework for tailored analytical applications. With new neural network algorithms, data mining preprocessing algorithms, and additional advanced statistical algorithms, analysts in the fields of finance, business analytics, bioinformatics and life sciences can tailor production applications for data mining and predictive analysis of complex data.

Advanced Numerical Analysis Combined with Charting

The JMSL Library is the only solution for Java programmers, which combines integrated charting with the reliable mathematical and statistical functionality of the industry-leading IMSL™ Numerical Library algorithms. This blend of advanced numerical analysis combined with visualization on the Java platform allows organizations to gain insight into valuable data and share analysis results across the enterprise quickly.

TYPICAL APPLICATION AREAS

- Risk Management and Portfolio Optimization in Finance and Insurance
- Manufacturing Yield Analysis, Process Control
- R&D Analytical Tools for Data Analysis and Product Optimization
- Energy Consumption Analysis

- Customer and Market Visual Data Analysis
- Bioinformatics and Life Sciences
- Extending Analysis and Visualization Capabilities for ISVs
    - Business Intelligence
    - Databases
    - Supply Chain

Neural Network Engines for Tailored Business Analytics

The JMSL Library now includes neural network technology that adds to the broad selection of existing data mining, modeling and prediction technologies available across the IMSL Family of products.

One of the most powerful features of this set of neural network forecasting classes is the ability to mimic human problem-solving processes by applying knowledge gained from historical data to new problems, and fine-tuning the forecasting accuracy over time. With this ability, businesses can extract information such as historical cost data and apply this to the neural network to forecast future costs with increasing degrees of accuracy.

The JMSL Library neural network implementation utilizes a feed forward network engine, which is especially suited for forecasting and binary classification problems. Special care was taken to ensure that network training is done efficiently and quickly in Java. Users are able to fine-tune network training to produce customized solutions for large and small training applications. The JMSL Library also has an advanced set of data pre- and post-processing algorithms. These algorithms facilitate and automate the normally tedious development requirement of pre- and post-processing of data. This saves a tremendous amount of time and effort as it avoids arduous manual data processing implementations.

JMSL™
Numerical Library

Visual Numerics®

- **Neural Network engines for advanced forecasting and data mining**
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- **Data pre- and post-processing algorithms for neural networks**
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- **Added multiple linear regression and nonlinear regression algorithms for producing predictive models**
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- **Hierarchical cluster analysis for classifying and analyzing data**
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- **New heat map chart to display two dimensional array of color values**
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- **Categorical Generalized Linear Model for analysis of categorical data**

Visual Numerics®

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Create Leading Edge Applications with Powerful Statistics

New statistical algorithms in the JMSL Library will assist statisticians and analysts with applications in areas such as bioinformatics and life sciences where data sets tend to be extremely large and complex. Additions in the areas of multiple regression improve predictive modeling based on historical data and new hierarchical cluster analysis is used to classify and analyze data sets into tiers of variables defining each cluster of related data points.

Another important addition to the JMSL Library is the inclusion of the heat map chart type, which is used in a number of areas, including life sciences for displaying two- dimensional arrays of color values. The heat map chart adds to an already strong and broad charting offering in the JMSL Library and helps analysts in a number of fields develop advanced numerical applications in Java.
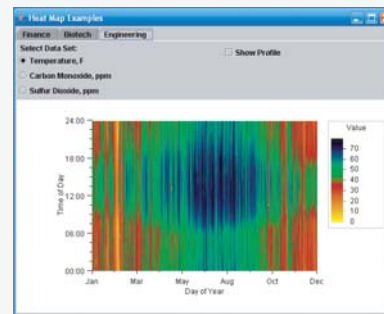
Mathematical, Statistical and Charting Functionality

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

Technical Experts Who Are the Best in the Industry

Augment your development productivity by utilizing Visual Numerics' Professional Services team to help find the best solution for your problem and deliver the support needed to ensure continued success. The highly skilled technical experts in our Professional Services organization collaborate with customers to identify specific application requirements at the initial phase of every project. We provide all levels of support from custom algorithm development to simply helping customers better understand their analysis and visualization needs. You can rely on our technical expertise and dedicated, hands-on help to achieve the highest return on investment.