

Java™ For Numerical Analysis and Data Visualization

LIKE MANY INDUSTRIES, THE FINANCE FIELD HAS DISCOVERED THE BENEFITS OF PLATFORM INDEPENDENCE. BY TAKING ADVANTAGE OF THE WORLD CLASS ANALYTICAL AND CHARTING FEATURES OF THE JMSL™ NUMERICAL LIBRARY FOR JAVA™ APPLICATIONS, QUANTITATIVE GROUPS ARE APPLYING JAVA-BASED TECHNIQUES ACROSS THE SPECTRUM OF THEIR MOST CRITICAL INITIATIVES.

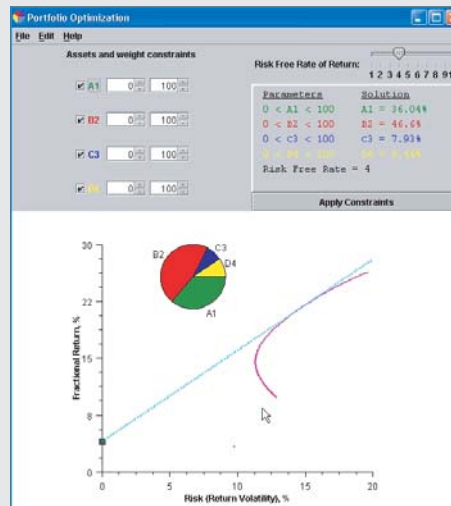
Forecasting

Many finance customers are employing forecasting algorithms such as ARMA and GARCH to forecast in the areas of equities, fixed income, currency and commodities. Quantitative researchers also use Feed Forward Neural Networks, a technique that continuously refines its forecasting model by applying knowledge gained from past results, fine-tuning its forecasting accuracy over time.

Trading

Organizations using the JMSL Library for trading systems are obtaining optimal performance in their deployments. These proprietary deployments often leverage quadratic programming and nonlinear programming algorithms, sometimes in distributed computing environments. One JMSL Library trading application with over 100 variables runs in less than half a second with \$1 billion worth of trades running through it every week.

Portfolio Optimization



Example of Portfolio Optimization Charting

The intuitive charting feature in the JMSL Library is helping asset managers and quantitative analysts develop versatile portfolio optimization applications. Linear, nonlinear, and quadratic programming are popular techniques used in portfolio optimization.

One portfolio optimization deployment reduced system execution time from 10 hours to 10 minutes by using the linear programming routines in the JMSL Library; all while cutting development time by 20%.

Performance Monitoring



Example of Heat Map Charting

In this example, developers leveraged a heat map charting capability to allow users to gauge portfolio performance quickly over a selected period of time. To make charts easily, developers use the JMSL Library's Chart Programmer's Guide, which contains a chart description, chart example and code example.

World Renowned Documentation and Support

The JMSL Library includes world renowned documentation, complete with tips and code examples, and live technical support, making application development quick and easy. Less complete libraries may include some documentation, but usually will not provide code examples or technical support, resulting in longer start up times.

Pure Java...Easy to Deploy and Embed

The JMSL™ Numerical Library has the same benefits of the award-winning IMSL Numerical Libraries available in Fortran, C/C++ and C# for .NET, but is written in pure Java. Pure Java code means:

Increased Robustness	Wrapped native code can cause server crashes, security violations and data corruption.
Simplified Development	Wrappers require the developer to access external compilers and pass arrays or user-defined data types to ensure compatibility between the different languages. The JMSL Library's pure Java code allows developers to write, build, compile and debug code in a single environment.
Increased Portability	Wrapped native code must be ported to each supported hardware/operating system combination. 100% Java code can run unchanged in any Java Virtual Machine (JVM).

Popular Algorithms For Finance

- **Optimization:** Linear and Nonlinear Programming, Quadratic Programming
- **Regression:** Linear, Nonlinear, Selection, Stepwise
- **Curve Fitting:** Cubic Splines, B-splines, Nonlinear Least Squares
- **Simulations:** Numerous Cumulative Distribution Function and Random Distributions
- **Forecasting:** ARMA, GARCH, Feed Forward Neural Network
- **Pricing Functions:** Bond Pricing, Interest Rate Calculations, Future Value

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