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**gridMathematica Provides Cost-Effective
Mathematica® Software for Grids**

A powerful parallel computing solution for the grid

With the release of *gridMathematica*, Wolfram Research offers a complete parallel computing solution for dedicated grids or clusters. It offers a highly cost-effective way of deploying *Mathematica* for parallel computations. *gridMathematica* can run on any cluster of machines, including Unix, Linux, Windows, and Mac OS X, and requires no more than TCP/IP connectivity.

This approach resonates well with customers and industry leaders, who are lending *gridMathematica* their full support. "Sun Microsystems, a long-time platform partner of Wolfram Research, is excited about the scalability that *gridMathematica* offers to high-end users," states Joerg

Schwarz, Senior Group Manager for Scientific and Engineering Computing at Sun Microsystems.

"Apple's new Xserve running Mac OS X Server provides a superior and cost-effective platform for parallel computing solutions such as *gridMathematica*," says Ron Okamoto, Apple's Vice President of Worldwide Developer Relations.

gridMathematica supports all common parallel programming paradigms, such as virtual shared or distributed memory, automatic or explicit scheduling, and concurrency, including synchronization, locking, and latency hiding. Other features include machine-independent



implementation and parallel functional programming as well as failure recovery and automatic reassignment of stranded processes in the event of a system failure.

For more information:
www.wolfram.com/gridmathematica

A New Kind of Science (NKS) Initiatives**NKS Lecture Tour**

Stephen Wolfram is conducting a lecture series with stops at major universities and research organizations, discussing the ideas and discoveries in his best-selling book. Look for upcoming appearances in California, New York, and other locations.

www.wolframscience.com/appearances

NKS 2003 Inaugural Conference

NKS 2003 will take place from June 27–29, 2003, in Boston, Massachusetts. The conference will bring together individuals from a broad range of fields to learn, interact, and get involved with the ideas and implications of *A New Kind of Science*.

www.wolframscience.com/conference/2003

NKS Summer School 2003

Apply now for NKS Summer School 2003, for students who want to further investigate the science in *A New Kind of Science*. NKS Summer School will run from July 3–18, 2003, at Brown University in Providence, Rhode Island.

www.wolframscience.com/summerschool/2003

upcoming events**april 10–12, 2003**2003 *Mathematica* Developer Conference
Champaign, Illinoiswww.wolfram.com/news/events/devconf2003**july 7–11, 2003**International *Mathematica* Symposium 2003,
Imperial College of Science, Technology and Medicine
London, Englandmetric.ma.ic.ac.uk/ims03


**The Wolfram
Education Group**

Wolfram Education offers *Mathematica* training courses throughout the year for all levels of users. For specific dates and locations check our online calendar:
www.wolfram.com/weg

Also look for Wolfram Research at these additional trade shows and conferences:

march 3–7, 2003American Physical Society Meeting
Austin, Texaswww.aps.org/meet**march 23–27, 2003**American Chemical Society Meeting
New Orleans, Louisianawww.chemistry.org/portal/Chemistry

For a full schedule of upcoming events, including training and seminar opportunities, refer to the Wolfram Research Calendar online at:

www.wolfram.com/services/training/calendar.html**Mathematica Ported to Intel's Itanium Architecture***Mathematica* soon to be available for a true 64-bit computing environment

Wolfram Research and NEC are excited to be among the first players to adopt the Itanium Processor Family (IPF) technology. The two companies have collaborated on the upcoming release of *Mathematica* 4.2 for NEC's Itanium Linux platform.

Intel's Itanium 64-bit architecture is designed for demanding next-generation computing applications like *Mathematica*. This new combination of NEC IPF server solutions and Wolfram Research's world-leading technical computing software takes full advantage of the potential of the IPF architecture, which is designed to deliver the highest possible performance for enterprise and technical applications.

Among the immediate benefits cited is the ability to run larger and more complex calculations than possible on current Intel 32-bit processors. At the same time, *Mathematica* users who are running increasingly larger computations and applications find themselves limited by the 4-GB address ceiling in the current Intel IA-32-bit architecture. By comparison, IPF will give them one million terabytes (1 terabyte = 1,024 GB) of address space to work with.

For more information:
www.wolfram.com/news/itanium.html

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tech tips

Mathematica 4.2 contains the new standard add-on package `NumericalMath`NMinimize``, which provides four different methods for global optimization: differential evolution (genetic programming), Nelder-Mead (nonlinear simplex algorithm), simulated annealing, and random search.

www.wolfram.com/mathematica/newin42/nminimize.html

Mathematica uses a high-precision arithmetic model, formally known as significance or range arithmetic, which approximates interval arithmetic—where a single floating-point number is used to represent the number and its error. For more on numerics, accuracy, and precision in *Mathematica*, see the Numerics in *Mathematica* demo.

library.wolfram.com/database/Demos/91

The new bundled *AuthorTools* package in *Mathematica* 4.2 simplifies the creation of technical books and articles, offering palettes for such functions as indexing and cross-referencing. In *Mathematica*, go to **File** ▶ **Palettes** ▶ **OpenAuthorTools**.

www.wolfram.com/mathematica/newin42/publishing.html

Mathematica 4.2 fully supports import and export of MathML 2.0. For example, you can copy and paste expressions directly between a website and your *Mathematica* notebook. Try it yourself with the MathML tools at MathML Central.

www.mathmlcentral.com

Additional Application Packages

Derivatives Expert III's new features include integration with SQL databases like Oracle, pricing with Monte Carlo simulation, and several new exotic options.

www.wolfram.com/applications/derivatives

machine learning framework is a powerful tool for all types of data mining and machine learning applications.

www.wolfram.com/applications/mlf

Operations Research 3.0 adds reinforcement learning and new shortest-path algorithms to its tools for constrained optimization.

www.wolfram.com/applications/operationsresearch

user profiles

Harker School, one of the most prestigious schools in Silicon Valley, has incorporated *Mathematica* into all of its math classes. Harker has an unlimited license program that enables the school to install *Mathematica* on every computer on campus, to provide teachers with personal licenses for home use, and to supply individual copies to upper-level students for use on their required personal laptop computers. According to Joanne Mason, Director of Math Studies at Harker, "*Mathematica* offers the ability to do advanced calculations, symbolic mathematics, graphics and word processing all at the same time, in the same document, on any computer platform our students may be running."

www.wolfram.com/news/harker.html

New York Schools' Particle Telescope Project (NYSCTP) is being implemented by NYU professor Glennys Farrar and several of her colleagues at Columbia University and Barnard College along with students and teachers from New York City high schools. With support from the National Science Foundation and Wolfram Research, they plan to build a cosmic particle observatory that will enable them to detect and study rare and powerful cosmic particles. Ten of these detectors were built by students during an intensive two-week summer institute at NYU this past August and are located at schools in diverse neighborhoods including Stuyvesant, Queens, and the Bronx. Each detector is attached to a circuit board and a computer equipped with a donated copy of *Mathematica*, which the students use to measure and analyze the particles.

physics.nyu.edu/NYSCTP

Data Training and Analysis with Neural Networks

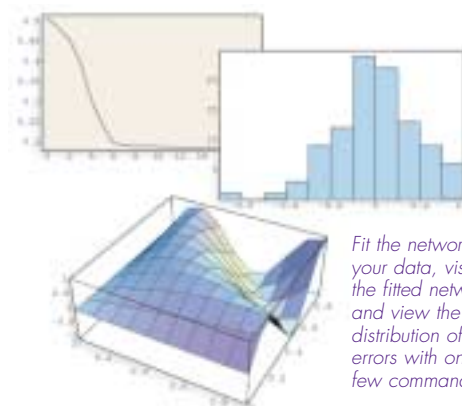
A robust environment for modeling systems with neural networks faster and easier than ever before

The new *Neural Networks* application package from Wolfram Research provides a robust environment for creating predictive models. Artificial neural networks have revolutionized the way researchers solve complex, real-world problems in engineering, science, economics, and finance. Now users can test and explore neural networks faster and easier than ever before, using the computational power and flexibility of *Mathematica*.

Neural Networks is designed to give professionals and students the tools to train, visualize, and validate neural network models. It supports a comprehensive set of neural network structures and implements state-of-the-art training algorithms while taking full advantage of *Mathematica*'s number-crunching and visualization capabilities. It also includes special functions to address typical problems in data analysis, such as function approximation, classification and detection, clustering, nonlinear time series, and nonlinear system identification problems.

Professionals and students with little or no background in neural networks will benefit from the comprehensive online documentation, the large number of examples, and the interactive online

Premier Service customers receive 15% off their purchase of this and selected other Wolfram Research application packages.



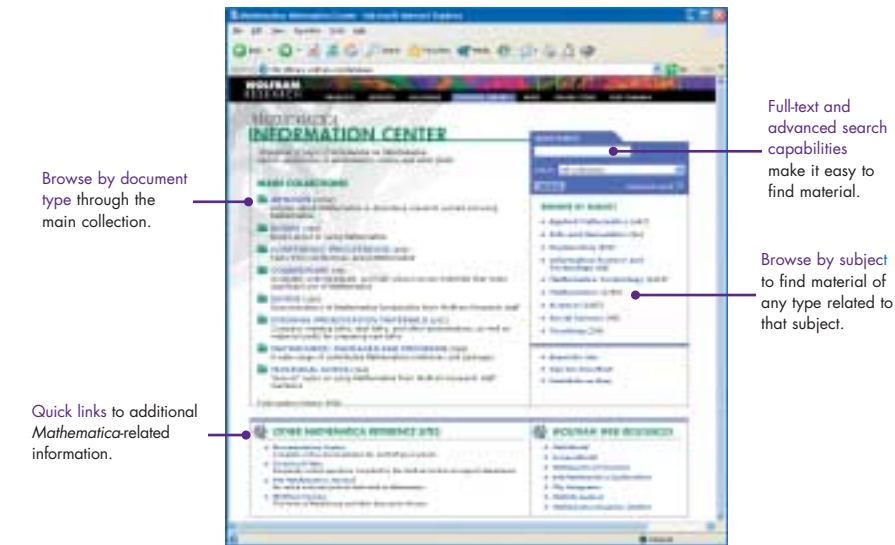
Fit the network to your data, visualize the fitted network, and view the distribution of errors with only a few commands.

tutorial. At the same time, advanced users will appreciate the flexible options for each function and numerous possibilities for modifying the included algorithms, as well as the ability to develop new training algorithms of their own to further extend the capabilities of the package.

For more information: www.wolfram.com/applications/neuralnetworks

The Mathematica Information Center

Thousands of *Mathematica* resources—all in one place



Browse by document type through the main collection.

Quick links to additional Mathematica-related information.

Full-text and advanced search capabilities make it easy to find material.

Browse by subject to find material of any type related to that subject.

The *Mathematica Information Center* is a new online treasury of books, articles, tutorials, courseware, and other electronic resources. The *Information Center* brings together items from the long-lived and popular *MathSource* website, the *Mathematica* Resource Library, submissions from *Mathematica* users, and new content from Wolfram Research.

The site is fully indexed and equipped with full-text and advanced search capabilities as well as an updated subject-classification scheme that makes finding materials easier than ever. Items are

presented in a standard format that includes summaries, bibliographic information, and in many cases links to the full text.

Continuing in the tradition started with *MathSource*, users are encouraged to contribute materials and suggestions to the *Mathematica Information Center*. Sharing programs and notebooks with other users makes *Mathematica* a richer, more valuable tool for everyone.

For more information: library.wolfram.com

To have the latest news and updates from Wolfram Research delivered direct to your inbox, subscribe to *MATHwire*, our email newsletter, at: www.wolfram.com/mathwire

new developments

Recent Book Releases

Precalculus: Anticipating Calculus Using Mathematica Labs by Barry Cherkas and Daniel S. Chess
store.wolfram.com/view/book/ISBN0971634718.str

Computational Financial Mathematics Using Mathematica: Optimal Trading in Stocks and Options by Srdjan Stojanovic
store.wolfram.com/view/book/ISBN0817641971.str

Mathematica for Physics, Second Edition by Robert L. Zimmerman and Fredrick I. Olness
store.wolfram.com/view/book/ISBN0805387005.str

Nonlinear Physics with Mathematica for Scientists and Engineers by Richard H. Enns and George C. McGuire
store.wolfram.com/view/book/ISBN0817642234.str

New in the Web Store

Tensors in Physics
download
store.wolfram.com/view/book/D0709.str

Algebra, Trigonometry, & Mathematica
download
store.wolfram.com/view/book/D0711.str

Utility Upgrades

J/Link 2.0.1
J/Link Integrates *Mathematica* and Java.
www.wolfram.com/solutions/mathlink/jlink

MathReader 4
This free *Mathematica* document reader is now compatible with Mac OS X.
www.wolfram.com/mathreader

Mathematica Teacher's Edition for Mac OS X

This new product designed especially for high school teachers and community college professors is now available for Mac OS X.
www.wolfram.com/news/mteforox.html

Professor Richard Crandall is a renowned computational scientist, author, and long-time *Mathematica* user who specializes in developing algorithms for interdisciplinary use. His latest work, coauthored with number theorist Carl Pomerance, is entitled *Prime Numbers: A Computational Perspective*. This recent book explains in plain English what is being done in advanced number-theoretical algorithms of today. Crandall and Pomerance also released a companion code set, *PrimeKit*, which contains the *Mathematica* support code for all 112 algorithms discussed in the book as well as an implementation of the celebrated AKS primality test.
www.wolfram.com/news/crandall.html

Experience Exchange

Submit your nonproprietary journal or conference articles, papers, web links, or other *Mathematica*-related success stories to experience@wolfram.com. If we feature your work on our website, we'll send you a *Mathematica* T-shirt. www.wolfram.com/mathematica/experience

BattleBots are bringing aggression, determination, and mechanical engineering to a living room near you. "With *BattleBots*, one can be aggressive and yet nobody gets hurt," says William McHargue, a freelance physicist and avid participant in this new fighting-robot craze. McHargue used *Mathematica* to predict the basic performance of his robot, which defeats its opponents by spinning rapidly and smashing into them. Now, when McHargue wants to make changes to his *BattleBot*, all he has to do is to plug the new data into his existing *Mathematica* model.
www.wolfram.com/news/battlebots.html