Mathematica 7

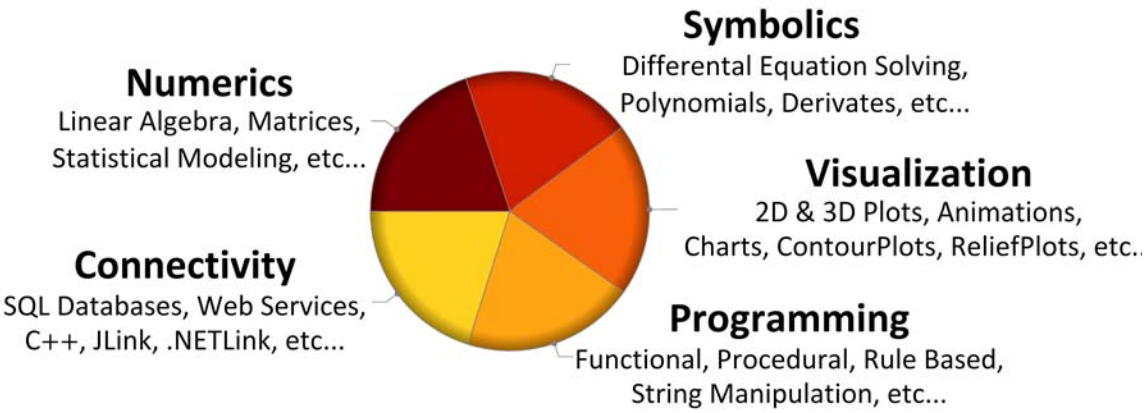
Casualty Actuaries of the Desert States Summer 2010 Meeting

Stephanie Harpst
Domestic Account Executive
Wolfram Research, Inc.
Champaign, IL

Jason Cawley
Wolfram Solutions, LLC
Phoenix, AZ

Mathematica 7

Mathematica is an extremely comprehensive system.



Mathematica features we'll be covering

--Mathematica Basics

--Numerics

--Symbolics

--Data Analysis & Visualization

--Programming

Mathematica 7

One Integrated System

Mathematica **is a highly integrated system that combines numerics, symbolics, visualization, programming, user interface construction, and dynamic interaction.**

-- Decrease development time by eliminating steps through automation.
-- Leverage a knowledge base of thousands of functions, algorithms, and methods.
-- Increase productivity with a uniform system for handling every expression.

Dependable Results

Untracked numerical precision is a major cause of unrecognized errors in engineering and science calculations. Mathematica addresses this problem in many different ways.

-- Mathematica provides systemwide precision control.
-- Automatic Algorithm Selection selects the best algorithm for your specific problem.
-- Mathematica's numerics support any precision or number size across all functions.

Mathematica 7

Statistics

Unlike most statistics programs, which have evolved gradually from specific libraries, *Mathematica's* greater range of capabilities and integration allow it to easily incorporate the latest developments in statistics and data analysis.

--Fast and high-quality number generation.
--Create random numbers from any distribution.
--Choose from a wide variety of statistical distributions.
--*Mathematica* has a number of means for common statistical visualizations.

Optimization & Curve Fitting

Integrated into *Mathematica* are a full range of local and global optimization techniques, both numeric and symbolic, including constrained nonlinear optimization, interior point methods and integer programming—as well as original symbolic methods.

Linear Algebra

***Mathematica* is used for a variety of linear algebra operations including matrix manipulation, vector operations, tensors, and solving linear systems. Using a high-level programming language, like *Mathematica,* allows you to handle complex operations quickly and efficiently.**

Mathematica 7

Computable Data Formats

Mathematica **has integrated several data soruces into the core system, allowing you to access them through functions such as FinancialData, CountryData, and much more.**

Importing and Exporting

Mathematica **automatically handles hundreds of data formats and subformats. Import and Export handle not only tabular data, but also data corresponding to graphics, sounds, expressions and even whole documents.**

Professional Graphics

Mathematica's **visualization engine produces professional quality graphics, both static and dynamic, that are automatically optimized for computational efficiency and aethetics.**

-- Create visually compelling images with a number of automated functions.
-- Generate graph layouts (i.e. flowcharting) for routine computational work.
-- Improve smoothness and artifact reduction with adaptive plot refinement.

Mathematica 7

Full Programming Language

Mathematica **has a fully featured, modern, symbolic language that enables you to create anything from models and algorithms to complex simulations.**

-- Express your technical ideas naturally with a range of programming paradigms.
-- *Mathematica*'s language is highly literate -- easily readable by you and your group.
-- Create sophisticated results with minimal amounts of coding through the high-level language.

Stephanie Harpst
Account Executive
(800) 965-3726 x-3481
sharpst@wolfram.com