Review of New Features in Maple 18

Summary

Many of the highlighted new features in Maple 18, as in Maple 17, appear heavily correlated with earlier features of *Mathematica*, but are often only skin-deep.

Only a small fraction of *Mathematica*'s advances make it into Maple at all. For those that did, the average time lag between features being introduced in *Mathematica* and an initial, skin-deep implementation in Maple 18 was around eight years. Look at *Mathematica* 9 for what to expect in Maple's 2020 release!

New Features Timeline

Maple 18 feature (2014)	*Mathematica* feature	Notes
Time series	2012	Maple does not include *Mathematica*'s support of FARIMA processes, time series-based hypothesis testing, or time series property measurements such as covariance functions. *Mathematica* does not yet support exponential smoothing models.
Keyword and command name searching in help	1996	*Mathematica*'s help system is built around interactive CDF content, allowing examples to be edited and evaluated in place and dynamic content to be interacted with. Maple's help files are static, uneditable, and unevaluatable.
Visualization—background colors in 2D plots	1988	Background colors are controllable in *Mathematica*'s 3D plots as well as 2D plots.
Visualization—custom plot shading	2007	As well as being able to apply arbitrary color blends or pre-designed color gradients to plots, *Mathematica* also allows the application of these blends using a custom mapping function, effectively giving you an extra dimension to 3D plots.
Visualization—background images in plots	2007	*Mathematica* provides powerful image processing capabilities that Maple lacks, so that as well as background images being included verbatim, they can also be transformed programmatically.
Visualization—texture mapping	2010	*Mathematica* provides powerful image processing capabilities that Maple lacks, so that as well as texture images being used verbatim, they can also be transformed programmatically.
Visualization—color tools	2012	*Mathematica* supports CMYK, HSB, XYZ, LAB, and LUV color spaces, as well as RGB.

Maple 18 feature (2014)	*Mathematica* feature	Notes
Visualization—programmatic control of image size	1988	
Signal processing—Blackman–Nuttall and Bohman windows	2012	
Calculus palette	1996	*Mathematica* 3.0 introduced completely customizable input and action palettes that can be shared between users. Maple still only has the palettes chosen for you by the Maple developers.
Möbius Project	2007	In 2007 the Wolfram Demonstrations Project set out a clear vision for a platform for sharing interactive apps for demonstrating technical ideas. In the year since MapleSoft launched their imitation, it has accumulated 235 apps, 75 of which have been included in Maple. Thanks to the ease of interface creation provided by *Mathematica*'s superior Manipulate command, in the same period the Wolfram Demonstrations Project has grown from 8500 apps to over 9400 apps.
One-step app creation—custom placement of controls	2007	Maple's "Explore" command is a skin-deep attempt to support *Mathematica*'s popular Manipulate command. As well as being able to position controls spacially, *Mathematica* also supports advanced layout controls such as collapsible areas, tab views, and more. These can be applied to both controls and outputs.
One-step app creation—choice of control types	2007	While Maple now allows you to change the control component for ranges, *Mathematica* also provides alternative control choices for discrete, Boolean, and color inputs and supports custom component creation.
One-step app creation—combo boxes	2007	*Mathematica* also allows lists of parameters to be chosen by setter bars, multi-select combo boxes, sliders, and custom components.
One-step app creation—customization of the size of the display component	2007	As well as controlling the size of output, *Mathematica* supports dynamic resizing under program or user control. *Mathematica* also supports constrained region resizing with automatic scrollable area and dynamic adjustment of the interface to accommodate large content.
One-step app creation—interactive marker controls on 2D plots	2007	*Mathematica* also supports user creation and deletion of locators and custom locator appearance, using any image.

Maple 18 feature (2014)	*Mathematica* feature	Notes
One-step app creation—image output	2007	*Mathematica*'s Manipulate command automatically supports any kind of output supported by *Mathematica*, including formatted text, math, sound, graphs, 2D and 3D graphics, dynamic content, and GUIs, as well as images and 3D images. Maple still has a long way to go to catch up with Manipulate.
Interactive components—controllable shortcuts	2007	
Interactive components—masked input fields	2010	
Interactive components—auto-fit math component	2007	All kinds of output can be auto-fitted or constrained with automatic scroll bars in *Mathematica* GUIs.
Interactive components—custom image toggle button	2007	
Interactive components—embed sounds	2007	While *Mathematica* does not support OGG, it does support AIFF, AU, FLAC, SND, Wav, Wave64, and MIDI sounds.
Interactive components—hide borders	2007	As well as being able to control the presence of borders, *Mathematica* allows you to control the style of borders independently on each side (thickness, color, dashing, transparency, etc.) It also supports arbitrary rounded corners.
Statistics for students	2013	There is a rich ecosystem of educational tools built on *Mathematica*, but they are not included in the product itself. The Wolfram Demonstrations Project is a key source, but the central tool of the Maple Statistics for Students functionality is similar to this example published on the Wolfram Blog in 2013.
Graph theory—DrawGraph performance improvements	2007	*Mathematica*'s GraphPlot supports six different styles of graph plotting. The Maple 18 marketing materials make an ill-considered comparison in graph-drawing performance with *Mathematica*, since *Mathematica* defaults to a "spring" layout method, while Maple does not. Maplesoft documents acknowledge that "spring" will usually give the best visualization, but if performance is the priority then each of *Mathematica*'s other methods is faster than Maple for the example used in the Maple marketing materials. Three of *Mathematica*'s methods produce the visualization in under 0.25 seconds, compared to 18 seconds in Maple.

Maple 18 feature (2014)	*Mathematica* feature	Notes
Step-by-step solutions	2010	Maple's Student Basics package provides step-by-step solutions only for linear equation solving and polynomial expanding. *Mathematica*, through its connection to Wolfram|Alpha, can also provide Step-by-step solutions for polynomial, trigonometric, and logarithmic equation solving; as well as limits, integrals, derivatives, differential equations, partial fractions, line intercepts, number theory factoring, completing the square, determinants, row reduction statistics problems, basic arithmetic and more.
URL import	2007	*Mathematica* can import data from URLs in over 160 formats.
3D graphics formats	2007	*Mathematica* supports 16 3D graphics formats, including the six that Maple now supports.
Compressed file support	2007	As well as the ZIP and GZIP formats now supported by Maple, *Mathematica* also supports TAR, BZIP2, and two formats of its own that are optimized for compressing *Mathematica* expressions.
Inert expression representation	1988	See the *Mathematica* functions HoldForm and Hold.
Random matrix generation	2007	*Mathematica* supports generation of random data over any number of dimensions from over 140 different distributions.

For more comparison information see
http://www.wolfram.com/mathematica/compare-mathematica/compare-mathematica-and-maple.html