## COMPUTER SOFTWARE REVIEWS

# Origin 7.0: Scientific Graphing and Data Analysis Software

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OriginLab, since its founding as Microcal Software in 1991, has established a solid reputation for itself in the data analysis software market; the previous versions of Origin—4.0, 5.0, and 6.x—received favorable reviews,[1−3] and the November 2001 release, version 7.0, is no less impressive.[4] At the most basic level, this piece of software satisfies the functional requirements that one would expect to see in any graphing package: accepting data from a variety of file formats, creating useful visualizations, and exporting these images for use in presentation or publishing software. Touted as an application "where ease-of-use and power intersect", this version exceeds expectations. The incorporation of an Origin-specific compiled programming language, Origin C, which can interface with Numerical Algorithms Group (NAG) function libraries adds a level of sophistication to this product that is not seen in many similar packages, yet this increased complexity is mediated through the implementation of an intuitive and customizable user interface.

Installation was very straightforward, although I did have to call technical support regarding the proper input format for the serial number and licensing key. (The response of the OriginLab support staff was fabulous. I was not placed on hold, I was not simply told to refer to the manual, and I had my problem solved before I hung up the phone.) A custom installation option was not available so there was no way to avoid installing the entire package on my system, although this was a shortcoming that I did not find particularly troublesome. The only disk space-related decision that was required during installation involved copying the NAG libraries documentation, an option I would highly recommend if you intend to start programming in Origin C.

The main program interface may initially appear daunting with its array of menus and toolbars, but upon closer inspection, it is apparent that Origin allows the user to approach the task of data analysis in a very intelligent manner. By default, the interface is divided into a main workspace area and a Project Explorer. Because users save projects rather than individual files, the Project Explorer becomes an invaluable data management and organizational tool. A single project can consist of multiple view windows—Origin worksheets, graphs, function graphs, layout pages, Excel workbooks, matrices, and notes—each of which is used to tabulate, view, compare, and annotate data sets. The Project Explorer allows these view templates to be grouped together into individual folders, using Gestalt principles to enhance the subsequent retrieval of each set of visualizations and tables.

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I am under the impression that this software was developed with the end-user in mind because many common usability enhancements are present in this package. Context-sensitive menus (i.e., menus that offer different sets of options based upon the acceptable choices given a particular active window or worksheet) allow the user to avoid sifting through an overwhelming number irrelevant menu items. The work environment is highly customizable; toolbars can either be docked at the edges of the main window or float within the workspace. Graphing wizards help guide the user through the process of plotting a data set, and an extensive template library can be referenced and customized to produce plots with consistent layouts. The available help documentation is detailed and complete; the reviewer's copy of Origin 7.0 that I received was accompanied by two printed manuals: a Getting Started Manual and a Programming Guide. The content of the Programming Guide is duplicated within the electronic help resources, and other in-program help comes in the form of a general Origin Reference, an Origin C Reference, and a LabTalk Reference. Additional assistance is available through the OriginLab website[5] and the aforementioned technical support staff.

As with previous releases, the functionality of the software leaves little to be desired. Over 50 kinds of two-dimensional, three-dimensional, and contour graphs and charts can be plotted; roughly 200 linear and nonlinear curve-fitting functions are built-in to the software. Regression, Fast Fourier Transforms (FFT) and FFT filtering, peak and baseline analysis, correlation, convolution, and curve smoothing can be performed. Interoperability with other applications and backward compatibility with previous versions of Origin also contribute to the software's utility. Data can be imported into tables and graphs—often via a simple drag-and-drop—from Microsoft Excel, Lotus, Thermo Galactic, MiniTab, SigmaPlot, and dBase; supported file formats include Data Interchange Format (DIF), Windows sound files (WAV), Mathematica lists, and Kaleidagraph data as well as all popular digital image formats. ODBC-support allows numerical data to be imported from database tables. Documents created with Excel 95 or later can be opened directly in the main Origin workspace, and files created using the previous versions of Origin can easily be imported and saved in the Origin 7.0 format. Graphs and tabular data can be exported in 16 image formats—including BMP, JPG, TIF, WMF—or as ACSII files.

The minimum system requirements for Origin 7.0 are Microsoft Windows 95 or later, or Windows NT 4.0, or later; 133 MHz or higher Pentium compatible CPU; 64 MB of RAM; a CD-ROM drive; and 50 MB of available hard disk space. Additionally, Adobe Acrobat Reader software must

be installed[6] in order to view the optional documentation for the NAG libraries. Although there is no software-based limit to the number of data points or data sets that can be analyzed, computers that just satisfy the minimum requirements are likely to feel the effects of system-imposed computation limits. This review was written using the standard version of the software, and it was evaluated under Microsoft Windows 98 running on a 533 MHz Intel Celeron processor and 64 MB of RAM. The standard version of Origin 7.0 is available for $699, at an educational price of $524, and at a multiuser network/site license price (call for price).[7] An upgrade for users of Origin 6.x is available for $249; upgrades for users of Origin 5.0 are priced at $299, while Pre-5.0 versions can be upgraded for $525. Time-limited evaluation copies of the software are also available on a demo CD or via Internet download.[8] An additional product, OriginPro, is available for users who are looking for the functionality of the standard version but are also interested in developing custom applications within the Origin environment; this version is priced at $899 (educational price: $719) with upgrades subject to the same price schedule as the standard version. A complete list of product features can be displayed from the OriginLab website.[9]

## REFERENCES AND NOTES

(1) Bulseco, D. Origin 4.0. *HMS Beagle Magazine* [Online] **1996**, Issue 2. http://news.bmn.com/hmsbeagle/02/booksoft/dborig.htm (accessed May 2002).
(2) Bulseco, D. Origin 5.0 for Windows. *HMS Beagle Magazine* [Online] **1997**, Issue 20. http://news.bmn.com/hmsbeagle/20/booksoft/sreview.htm (accessed May 2002).
(3) Deschenes, L. A.; Vanden Bout, D. A. Origin 6.0: Scientific Data Analysis and Graphing Software. *J. Am. Chem. Soc.* **2000**, *122*, 9567.
(4) Simon, B. Origin 7: When Excel Graphs Aren't Enough. *PC Magazine* [Online] May 21, 2002. http://www.pcmag.com/article/0,2997,s=25424&a=26041,00.asp (accessed May 2002).
(5) http://www.originlab.com/www/support/.
(6) http://www.adobe.com/support/downloads/main.html.
(7) http://www.originlab.com/www/services/orders/index.asp.
(8) http://www.originlab.com/www/downloads/demo/index.cfm.
(9) http://www.originlab.com/www/products/index.asp.

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