



SigmaPlot 13.0 Development and Testing Procedures

Systat Software Inc. is committed to developing state-of-the-art software that enhances and improves the quality of scientific research. Systat Software Inc. is the only scientific software company that offers a full range of scientific and engineering tools designed to meet the special needs of research scientists and engineers. Below is a summary of the procedures used by Systat Software Inc. for developing and assuring high quality software for SigmaPlot 13.0 and related products.

Project SigmaPlot 13.0 for Windows

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Description of SigmaPlot

SigmaPlot goes beyond financially oriented spreadsheets and the "bells and whistles" of business graphing software by making technical features the highest priority. A user can choose from a full range of graphing options: technical axis scales, multiple axes, multiple intersecting 3D graphs, and much more.

SigmaPlot offers an intuitive Microsoft Office and Windows compatible interface. To start, users just need to click the graph type and style buttons on the Create Graph ribbon tab and select their data; SigmaPlot automatically creates a graph. For interactive graph creation, the Graph Wizard leads users quickly through each step. All graph attributes are customizable by double-clicking on the graph and choosing properties from the easy-to-read UI controls on the Graph Properties dialog box.

To help users see complex interactions in their 3-D data, the program powerfully renders multiple intersecting 3-D graphs with hidden line removal. A Regression Wizard automatically determines initial parameters to help fit data.

New Features and Improvements Implemented in SigmaPlot 13.0

Graph Features

- Forest Plots
- 10 New color schemes
- Addition of the smooth Kernel Density graph to bar-type Histograms
- Addition of mean and standard error bars to the Dot Density Graph
- Legend Improvements
 - Provide Horizontal, Vertical and rectangular legend shapes
 - Cursor over side or upper or lower handle allows to provide multi column legends.
 - UI support to set number of columns for legend items in Properties dialog. The permissible column numbers are displayed in the combo list.
 - Change the number of columns for legend items by selecting and dragging the middle handle in the bounding box.
 - Reorder legend items
 - Thru properties dialog – Can move one or multiple legend items up or down using the up/down control on top of the list box
 - Thru cursor movement – Can move one or multiple legend items up or down. Select the legend item(s) and use up and down arrow key for movement within the bounding box
 - Thru mouse select and cursor movement for items in the bounding box
 - Individual legend items property setting – Select individual legend items and use mini tool bar to change the properties.
 - Legend box blank region control thru cursor
 - Cursor over corner handle allows proportional resizing
 - Add simple direct labeling
 - Support 'Direct Labeling' in properties dialog using the Checkbox control "Direct Labeling".
 - Ungroup legend items (Still the bounding box is maintained, but not visible), the individual legend items can be moved to preferred location.
 - Legend Title support has been added, by default there is no title. The user can add a title to the legend box using the legend properties panel.
 - Support to reverse the legend items has been added in the right click context menu.
 - Double click on Legend Solid will open Legend Properties
 - Double click on Legend text will open Legend Properties
 - Revert has been added to legends to reset to default

Analysis Features

- Principal Component Analysis
- ANCOVA
- Added P values to multiple comparisons for non-parametric ANOVAs.
- Removed the combo box choices for multiple comparison significant levels and tied the significance level of multiple comparisons to the main (omnibus) test.
- Added Akaike Information Criterion to Regression Wizard and Dynamic Fit Wizard reports and the Report Options dialog. (The spec is in Dropbox)
- Added back the Rerun button in the SigmaStat group.
- Updated the fit library standard.jfl
 - Include several probability functions to define the model for fit equations.
 - The tolerance value for all equations has been modified to use “e-notation” instead of fixed decimal. This allows the user to read the value without scrolling.
 - Additional weight functions had been added earlier to the fit equations of the Standard Curves section of standard.jfl. These weight functions have now been added to all equations in standard.jfl. There is a slight variant added for 3D equations.

User Interface Features

- Rearrange Notebook items by dragging
- Added SigmaPlot tutorial PDF file
- Line Widths From A Column

Import/Export Features

- Added the SVG and SWF file formats for graphics export
- Added Vector PDF export. Used to be Raster PDF
- File import and export support is added for Versions 13 and 14 of Minitab, Version 9 of SAS, Version 19 of SPSS and Version 13 of Symphony

Software Methodology

Software functionality is segmented into features and bug fixes. Microsoft Project was used to organize the project as well as to track the project. The most difficult features were implemented first so we had time to test them.

From start to finish, the product planning and development cycle includes:

1. Concept (marketing and feasibility)
2. Requirements (Statement of Requirements, SOR)
3. Design (external and internal specifications)
4. Planning (Creation of Microsoft Project file)
5. Development (Tracking of the project using Microsoft Project)
6. Testing and documentation of features for each build
7. Beta Testing
8. Product release

Programming Languages Used

- Visual C++, Microsoft Visual Basic

Development Tools Used

- Microsoft Visual Studio 2010 using Microsoft Foundation Classes version 9
- Wise for Windows installer 6.0
- IBM/Rational ClearCase
- Elementool Bug Tracking System
- Oxygen 15.2
- MathType 6.9
- Fullshot 9.5.1.9

Product Compatibility

- Microsoft Windows 8
- Microsoft Windows 7
- MS Windows Vista
- MS Windows XP
- Microsoft Office 2003 and up (paste to Powerpoint Slide, Insert Graphs into Word and other macros)
- SPSS (up to ver. 19)
- IE 6 and up, for use with the SigmaPlot WebViewer

Software Quality Assurance

Systat Software Inc. is committed to ensuring high quality software by using the SQA process, a planned and systematic set of activities that ensures that software processes and products conform to requirements, standards, and procedures. It includes the following disciplines:

- Quality assurance
- Quality engineering
- Verification and validation
- Error detection and reporting
- Error tracking, Corrective action and further error regression

Test Procedures

Manual tests are executed to exercise and evaluate SigmaPlot to demonstrate that it satisfies the specified requirements. These tests also identify differences between expected and actual results by using a broad set of test procedures.

Test procedures are derived from external specification documents and are guidelines to follow while testing the product.

A SigmaPlot macro is used to run the NIST nonlinear regression equations and data sets to compare to published results.

Applications Used for Verification

- SYSTAT
- SigmaStat
- SPSS
- Adobe PhotoShop
- Adobe Illustrator
- GS Tools
- Corel Draw
- MS Office products (Word, Access, Excel)
- R

Hardware and Operating System Testing Platforms

- SigmaPlot 13.0 is tested on the in QA Lab on Pentium 4 and higher personal computer systems.
- SigmaPlot 13.0 is designed and verified to work properly with the following operating systems:
 - Windows 8
 - Windows 7
 - Windows Vista
 - Windows XP

Independent Verification and Validation

Systat Software Inc. is committed to providing a beta testing process whereby the products of the software development life cycle phases are independently reviewed, verified, and validated by organizations that are completely independent of the Systat Software Inc. Approximately 20 scientists and engineers have participated in beta testing of each release of SigmaPlot, including version 13.0 and their feedback is invaluable for the increase of overall quality of the product.

End.