OriginPro® 2020
Much Faster Data Import
Much Easier Graph Customization

Feature List

*(Updated for version **2020** on Oct 22, 2019)*

64 Bit Support

Overview

▫ Native 64-bit and 32-bit applications

▫ Import ASCII files bigger than 4GB with 64-bit application
Memory capacity limited only by installed hardware with 64-bit application

Unicode (UTF-8) Support

Overview

▫ Use Unicode characters in Long Names for worksheets, graph pages and other Origin window types

▫ Enter Unicode text in worksheet cells and metadata area

▫ Type code and press ALT+X to insert character

▫ Unicode (UTF-8 Encoded) Text Strings Support in LabTalk and OriginC

Start Menu with Search

Overview

▫ View recently opened Origin Projects, other files, menus and Apps

▫ Type keywords or phrases into edit box to search within Origin

Apps in Origin

Overview

▫ Find and install Apps from File Exchange area of the OriginLab website

▫ Use Apps Gallery window in Origin to launch and manage Apps

▫ App Center for easy installation and update of Apps

▫ Origin menu indicates when updated versions of installed Apps are available

▫ Several pre-installed Apps for publishing and curve fitting

Large Data Support

Overview

▫ Multi-threaded ASCII import enables fast import of large text files

▫ Density dots and Color dots for large data

▫ Fast scatter plots for large dataFast speed for colormap contour even without speed mode

▫ Fast Data Highlighting on graph with large data

▫ Dense Data Mode on page level enables fast redrawing

▫ Fast cell calculation and result sheet recalculation

Importing Data

Overview

▫ Drag-and-drop import of data and images

▫ Data Connector maintain connection with web file or local file as data source (CSV, HTML, JSON, MS Excel, Origin Project and more)

▫ Import data from an Origin project file

▫ Query and pull columns from Origin project files (*. OPJU)

▫ Save import settings to a worksheet or external files for repeated use

▫ Use saved settings to re-import files with a single click

▫ Run script after each file or all files are imported

▫ Import Wizard with visual feedback

▫ Handle non-standard files by programming

▫ Import multiple images into the same matrix sheet

▫ Customize File:Import menu by specifying which import types to display

▫ Extraction of file metadata for use in subsequent analysis or graphing operations

▫ Set Origin as default program to open desired data files

- Import specified column/rows for ASCII, Excel and CSV
- Undo import of ASCII, Excel and CSV

ASCII Data

- Unicode support
- Support for delimited and fixed formats
- Multiple delimiter support
- Separate header and data lines
- Extract Long Name and Units on same header line during import
- Extract metadata from filenames and header lines
- Control treatment of leading zeros, quotation marks, missing data points and alternate numeric separators
- Partial data import support
- Transpose on import
- Many date and time formats recognized
- Support for categorical data
- Source File header row to show imported file name

Third-Party Formats

- Binary and instrument formats:
  - CDF, HDF5
  - Data Translation (DCF, HPF)
  - EarthProbe (EPA)
  - Famos (DAT, RAW)
  - ETAS INCA MDF (DAT, MDF)
  - Heka (DAT)
  - JCAMP-DX (DX, DX1, JDX, JCM)
  - NetCDF (NC)
  - NI DIAdem (DAT)
  - NI TDM (TDM)
  - pCLAMP (ABF, DAT)
  - Princeton Instruments (SPE)
  - Somat SIE (SIE)
  - Sound (WAV)
  - Thermo (SPC, CGM)
  - EDF (EDF, BDF)
  - MZXML
- Software-specific formats:
  - IgorPro (PXP, IBW)
  - KaleidaGraph (QDA)
  - MATLAB (Mat)
  - MATLAB with structured data (Mat)
  - Minitab (MTW, MPJ)
  - Excel (XLS, XLSX, XLSM)
  - TDMS (LabVIEW 2009)
  - GraphPad Prism
  - SPSS(SAV)
  - SAS (SAS7BDAT)
  - Tektronix (ISF)
  - BRUKER OPUS

Image Formats

- Support formats: PNG, GIF, TIF, JPG, BMP, TGA, PCX, PSD, WMF (Convert to Raster)

Database Access

- Graphically construct SQL queries, save named SQL query with workbook or to disk
- Define SQL queries in Query Editor, which supports syntax coloring and LabTalk substitution
- Database connecting interface: ADO and ODBC

Digitizer

- Digitize graphs (get data values for points) that exist as images
- Pre-processing of images: rotate, remove gridlines, clear background
- Supported coordinate systems: Cartesian, Polar, Ternary
- Auto trace lines: by point, by grids, by area
- Add labels to picked points

Collaboration & Connectivity

Collaboration

- Share files such as templates, Themes, custom tools, using group folder (easily controlled within multiple groups)
- Share files using user files folder across multiple computers
- Pack selected files including toolbars and custom code to external file (OPX) for sharing
- Export toolbar and floating window configuration to a file
- Option to switch language of interface

Connectivity

- Import or directly open Excel 97-2007 workbooks (XLS, XLSX)
- Drag-and-drop data from an Excel book opened in Origin directly into a graph

- Copy-and-paste Origin graphs directly into MS Word and PowerPoint
- Send data directly to Origin from LabVIEW with Origin Sub Vi's; send results back to LabVIEW as well
- MATLAB Console, R/Rserve Console, and Mathematica Link allow data exchange with Origin
- Use Origin as an Automation (COM) Server to send commands and exchange data from any COM-enabled client application

Exporting and Presentation

Exporting Graphs

- Creating movies from Origin graph windows using GUI tool or script
- Raster formats: BMP, GIF, JPG, PCX, PNG, PSD, TGA, TIF
- Vector formats: AI, CGM, DXF, EMF, EPS, PDF, WMF
- Export dialog with settings for precise width/height and resolution (DPI)
- Interactively select area of Graph Page for export or to copy-paste to other applications
- Save graph export settings as Theme for repeated use
- Copy graphs or layout pages to clipboard and paste to other applications such as Microsoft Word or PowerPoint
- Copy graphs and paste directly to online documentation tools such as Confluence page
- Paste link using Origin as an OLE 2 server
- Fit layers to page enables easy resizing of graphs for publishing
- Use layout page or worksheet with cell formatting to arrange multiple graphs and numeric data tables
- Batch print multiple graphs
- Master page for global annotation of graphs
- Transparency support for EPS files using raster elements
- Transparency support for PDF files

Exporting Data

- Export data to ASCII file with options to append to, or replace existing files
- Export mulit-sheet workbook as Excel file
- Print entire worksheet/matrix sheet or a selected range
- Batch print multiple windows
- Export workbook as NI TDM/TDMS file
- Export worksheet data as wave file

- Export matrix as ASCII or image file
- Print Preview support for multiple windows
- Copy and paste data as HTML/EMF table to other applications such as MS Word

Exporting Reports

- Export a report sheet as a multi-page PDF document

Exporting Images

- Raster formats supported: BMP, GIF, JPG, PCX, PNG, PSD, TGA, TIF

Presentation

- Slide-show of selected, all, or dependent graphs
- Export selected or all graphs directly to MS PowerPoint with specific slide layout and style
- Layout page to flexibly arrange graph/sheet/objects

Data Management

User Interface

- Learning Center dialog, including keyword search of sample graphs, helps users get started with Origin
- New Workbook dialog with build-in templates, plus ability to add user-template and set as default template
- Auto-hide Project Explorer and other dockable windows
- Plot menu with appealing icons
- Show basic descriptive statistic results in status bar, with copy to Clipboard support
- Collapsible menu and context menus
- Customize toolbar style
- Automatic transfer of workspace layout and User Files from previous version
- Indicator to indicate active window
- Object Manager to makes it easy to manage plots on a graph and worksheets on a workbook
- Support copy/paste of folders and workbooks across Origin sessions

Origin Project File (OPJ, OPJU)

- Project File structure (OPJU) with significant improvement in file size
- OPJU enable preview and thumbnail views of Origin Graphs/Workbooks/Matrices in Windows Explorer and File open dialog
- Ideal for storing all of your data, graphs, and analyses

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- Five page types for data storage and display: Workbooks, graphs, matrix books, layout pages, and notes windows
- Find metadata in project file
- Attach external files to a project
- Store analysis results in worksheets or the Results Log
- Support for auto-save for projects
- Individual backup file for each project for recovery
- Unsaved projects auto saved for 7 days, accessible from Origin Central
- Password protection of project files
- Audit log of project saves, with optional password protection
- Automatic audit log for all newly created projects
- Save project without data
- Duplicate workbook or project without data
- Properties dialog for folders or windows

Project Explorer

- View and organize the contents of your Origin project (OPJ) using an interface similar to Windows Explorer
- Organize and quickly access your work using hierarchical user-defined folders
- Create a favorites folder with shortcuts to important workbooks, graphs and notes
- Graph/workbook/matrix preview and folder/window tooltip on hover
- View windows in details, list, small, large and extra-large icons in Project Explorer
- In-place edit of comments, long name, short name

Workbooks & Worksheets

Data Storage

- Password protection for workbook/project
- Multiple worksheets per workbook
- Multiple matrix sheets per matrix book, and multiple matrix objects per matrix sheet
- Workbook size: Up to 1024 sheets, and 65,527 columns * 1 row or 90 million rows * 1 column per sheet
- Matrix size: Up to 90 million cells, depending on data type (note that memory limitations may prevent these values from being reached)
- Column-oriented data type can be general or free form (cells can hold both numbers and text), or can be fix-sized array (numeric cells)
- Numeric cells can be time, date, or basic numeric

types, including 4- or 8-byte float; 1-, 2-, and 4-byte, signed or unsigned integer; or 16-byte complex numbers; can also customize display format
- Displaying numeric values in fractions, percents, numeric units, pi, km, hex numbers etc.
- Global setting for default significant or decimal digits
- Worksheet acts as Virtual Matrix with nonlinear X/Y spacing supporting 3D graphing and analysis operations
- Virtual Matrix manager to organize Virtual Matrices

Data Organization and Metadata Support

- Column List View for worksheet to display only a column list
- Reserved rows for long name, units, comments, sampling interval, sparklines, column formula, column filter and user-defined parameters
- Sparklines on column headers display small graph of data for quick inspection (3 plots - line/box/histogram; 2 scale types - linear/log10)
- Easy customization of categorical data (sort, re-order, add or delete) and use it to control category entries in graphs/analysis
- Workbook organizer shows file import info including variables extracted from file header
- Manually or programmatically add metadata to workbook
- Add LaTeX equations to the worksheet metadata area and use them in graph axis titles and legends
- Sampling interval support for columns
- Drag range selection to auto fill data by extending or duplicating existing data
- Lock Icon on output columns to indicate recalculate mode for operations
- Support long name, units, comments and user-defined parameters for matrices
- Thumbnail on matrix to display small image of matrix data for quick inspection
- Drag and drop sheets to remove from, or add to, workbooks and matrix books
- Click-and-drag to adjust row height and column width in worksheets and matrices
- Extract worksheet data by condition
- Horizontal and vertical dividers for simultaneous viewing of different parts of worksheet
- Hide/Unhide columns and rows in worksheets
- Navigate Worksheets dialog for managing worksheets in the workbook

- Support adding long name and comments to worksheets
- Short name, long name and comments will be displayed as tooltip when hovering over worksheet tab
- Floating graphs in worksheet
- Add graph or notes window as sheet
- Treat missing values as blank in worksheet Formatting
- Support for rich text cell formatting
- Conditional Formatting: highlight cells by rules, highlight duplicate cells, and heatmap
- Unicode support for non-English characters
- Character Map dialog to find and insert Unicode characters in cells
- Embed graphs, layout, images, and notes in worksheet cells
- Image pop up for embedded graphs and images in worksheet cells and header rows
- Merge cells to flexibly arrange and present graphs and numeric data
- Insert links in worksheet cells to other cells, including cells from analysis report sheets
- Auto-size option for worksheet and matrix columns
- Save formatting of worksheet and matrix sheets to Theme/template for repeat use
- New Worksheet/Matrix dialog to specify format/Themes when creating new worksheet/matrix
- Set format of selected cells by condition

Graphs

Overview

- Pop-up mini toolbars provide access to common graphing customization options
- Quick access to all built-in graph types from toolbars
- Page, Layer, Plot hierarchy to organize data plot
- Plot with graph templates and organize templates using Template Library
- Copy-paste data plots between graph layers
- Batch-plotting to duplicate graphs using data from different columns/sheets/books for 2D, 3D and contour graphs
- Smart plotting with cloneable graph templates, allowing for one-click creation of graphs from sheets with a similar data structure
- Plot Setup dialog for quick plotting of data from multiple worksheets, common columns, Excel workbook and matrix book

- Create custom multi-panel plots
- Merge multiple graphs with preview
- Drag-and-drop data columns into graph
- Plot same column multiple times, such as different ranges, in a single graph layer
- Speed mode control for plotting large datasets, easily toggle for all layers by a button
- Color scale for color mapped plots with flexibility to customize ticks, levels, labels, layout, title.etc
- Bubble scale for size-mapped 2D plots with linear or nested layout. Anti-aliasing in screen display
- Isometric – link axis length to scale by X/Y ratio
- Select and customize single data points in a plot
- Quick edit graph element style with toolbars; In depth editing of graph element details with Plot Details dialog
- Easy color control to pick more colors and define custom colors
- Custom color palettes and incrementing symbol lists for color map and grouped data plot
- Symbol size increment for each plot in group
- Customize the format increment lists and color palettes for grouped data
- Introduce subgrouping for grouped data
- Full-screen view for graphs, maintaining aspect ratio or 3D plot from worksheet data (virtual matrix, with numeric or text XY)
- Layer Content dialog for easy adding, removing, grouping, ungrouping and reordering of data plots
- Show and hide layer with the layer icon context menu
- Easily stamp windows with project filename using Project Path button
- Disconnect graph page from active printer
- Hover on data plot to show tooltip of source data
- Pick data points from graph

2D Graphs

- Line – 12 line styles incl. segmented and spline
- Scatter - built-in or user-defined symbols
- Line and Symbol - 4 types
- Density Dots and Color Dots for large data
- Row-wise line series with error bars
- Column/Bar - 10 types including grouped column plots from indexed data and grouped stacked column plots
- Control column/bar width using dataset
- Normalize stacked column/bars to 100%
- Bridge Chart (McKinsey-Style Waterfall)

![OriginLab logo]

- Area - 9 fill area methods
- Bubble/Color Mapped - 3 types
- Multiple Panel - 6 types or create your own
- Multiple Axes Plot - 6 types or create your own
- Trellis Plot
- Cluster plot
- Pie and Donut Charts
- Kite Diagram
- Polar (r, theta) or (theta, r)
- Ternary Diagram, with scale customization and optional axes direction
- Smith® Chart
- Piper Diagram
- Stock Charts: High Low Close, Japanese Candlestick, OHLC Bar Chart, OHLC-Volume
- 2D Vector - 2 types: XYXY and X, Y, Angle, Magnitude
- Stacked lines by Y offsets with customizable offsets and option of grouped lines
- Windrose: raw or binned data
- Radar/Spider Chart
- 2D Function graphs and 2D Parametric Function graphs for plotting mathematical equations

3D Graphs

- Edit data range in 3D graph
- 2D symbol for 3D scatter
- 3D ternary surface/scatter
- Tetrahedral Scatters/Lines/Line+Symbols
- XYZ Scatter/Trajectory with optional drop-lines/projections/error bars
- 3D bars with data labels
- XYZ Bars with optional error bars
- XYY Bars, Ribbons, Walls, and Waterfall
- 3D stacked bars
- Normalize 3D stacked column/bars to 100%3D OpenGL-based waterfall plots
- Surface plot from both XYZ and matrix data
- Color map surface with optional projected contour
- Link contour line color to colormap
- Wire Frame and Wire Surface
- Surface with constant slices in X or Y direction
- Pie Chart
- 3D Vector – 2 types: XYZ-XYZ and XYZ-dxdydz
- Stretch any 3D graph axis to change aspect ratio

- Shearing or skewing of graph axes
- Rotate 3D plots graphically by clicking and dragging
- Missing value and grid-line skip support for 3D surface
- Color mapping of 3D bar plots using Z values
- Major and minor level support for 3D surface plots
- Multiple intersecting surfaces supported
- 4D Surface Plot with Custom Boundary
- Z-axis, including nonlinear scales, for waterfall plots
- Y- and Z-value color map support for waterfall plots
- Connect control in 3D waterfall which enables smooth waterfall lines
- 3D parametric surface
- 3D Function graphs and 3D Parametric Function graphs for plotting mathematical equations

Contour Graphs

- Create contour plot directly from XYZ data using triangulation
- Contour with categorical Z values
- Ternary contour
- Polar contour
- Color filled contour
- Black and white contour with lines and labels
- Gray scale map
- Heatmap (with/without labels) from XY/XYZ, virtual matrix and matrix
- Split Heatmap
- Custom level formatting using color, contour lines and labels
- Specify label prefix and/or suffix
- Set label decimal points
- Include color scale legend
- Individual contour line and level control
- Color palette support
- Control the display of missing values in contour
- Ignore Z missing values in XYZ contour
- Specify custom boundary for contour graphs using datasets and separately customize style of boundary lines
- Extract data points or show polygon area for any or all contour lines
- Generate grid from triangulation of contour plot

Statistics Graphs

- Probability plots including Weibull distribution
- Q-Q Plot

- Interval Plot
- Parallel Plot
- Sankey Diagram
- Alluvial Graph
- Pareto chart with option to combine smaller values
- Rug Plot
- Violin Plot
- Statistics Bar options for mean, max, sum, etc.
- Box and/or column scatter (opt to jitter data points)
- Grouped box plot – indexed or raw data
- Rectangular/diamond/i-shaped/notched box
- Box width/position controlled by dataset
- Display mean/median lines, percentile points in box charts
- Connect mean points, data points or other percentiles in box charts
- Individual control for whiskers, caps, median, mean and distribution curve in box plots
- Show outliers in box chart and display them in line
- Histogram, Stacked Histograms, and Histogram + Probabilities
- Scatter plot with marginal histogram or box chart
- Double Y Box Chart
- Control the number of bins or bin sizes for histograms
- Go to the binned data with a button in the Plot Details dialog box
- Checkbox to scale distribution curve by % of tallest bar for histogram plot
- Output distribution curve data to bin worksheet for histogram plot
- Label with bin counts, percentages, or both for histogram plot
- Stacked histogram
- 2D Kernel Density Plot
- Scatter Matrix (Histogram/Box chart in diagonal cells, Linear fit, R-square, confidence ellipse options)
- QC charts
- Optional distribution curves
- Before-After plot
- Population Pyramid
- Vertical/Horizontal/Circular Dendrogram

Image Graphs

- Image graph
- Profile tools: image/contour profile

Customizing Graphs

Graph Themes

- Copy and paste the format of one graph or element onto another graph or element
- Save a collection of formatting elements as a graph Theme
- Set system Theme to apply desired settings to all newly created graphs

Data Plot Color

- Independently set color for page, axes, labels, symbols, lines, area or bar fill
- Independent custom color support for all properties
- Color-mapped or color/shape/interior-indexed symbol
- Customizable increment list for color/shape/interior indexed symbol
- Color stretching for grouped data plots
- Apply built-in/user-defined color palettes
- Categorical data support for symbol color
- Color scale legends
- RGB color settings
- Labels on color scale legend can be shown on major levels or by increments
- Transparency and gradient fill control for graph objects

Data Plot Labels

- Auto-positioning of data labels with leader lines to data points
- Data labeling on specific indices/points, plus flexible label format controls such as displaying numbers in percent, fractions etc.
- Add or modify title text for layers
- Worksheet parameter row for annotating each curve in 2D Waterfall plot
- Associate dataset with data plot points, X, or Y axis
- Graphically attach text labels to individual data points
- Control color, font type, style, size, rotation, offset, background, and justification
- Tool to annotate a specific data point
- Label with leader lines for Pie Chart
- Labels for 2D Vector Plot
- Total Label on 2D/3D Stacked Column/Bar Chart

Line Styles

- Data point connection types include: straight, b-spline, spline, step (horizontal, vertical, center), Bezier, 2-point segment, 3-point segment, solid, dashed, dotted,

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Akima, modified Bezier

▫ Compound line style

▫ Customize line style for groups of data plots

▫ Customize dash and dot definitions (point values for widths)

▫ Masking support in line plots

Symbols

▫ Symbol size in X axis units

▫ Circle symbol size based on square, diameter or area

▫ Expanded set of over 100 built-in symbols

▫ Create custom symbols from bitmaps

▫ Offset plotting of duplicate points

▫ Categorical data support

▫ Color-mapped, as well as indexed symbol color/shape/size - up to 8 dimensions

▫ Custom symbol lists for grouped data plots

▫ Individual symbol edit control, with display in legend for 2D graphs

Fill Pattern

▫ Over 100 built-in fill pattern types, including standard geology patterns

▫ Option to add user-defined fill patterns

Plot Modifiers

▫ Customize plot attributes by modifier columns in the worksheet to create 3, 4, 5 dimensional plot.
    Symbol color, shape, size and interior
    Line color, style and thickness
    Fill color and pattern
    Data label color
    Angle and Magnitude of 2D Vector
    Column and box chart width, box chart position

▫ For 3D colormap surface, set the color map by values of another matrix or Z column

▫ Use indexing, color map of arbitrary values, or specific RGB values to assign color

▫ Define the color, shape, style, pattern increment list

▫ Legend can be customized to indicate such information

▫ Save Match Modifier by column index, name, or other metadata properties in graph template

Text Labels and Legends

▫ Default legend for data plot using metadata from worksheet or custom format

▫ Legend for categorical values

▫ Point-by-point legend

▫ Legend for box chart components

▫ New legend for fill area plot

▫ Legend text color same as plot color

▫ Customize symbol properties in Legend, or add new customized symbol/line entries

▫ Hide legend entries for hidden plots or fitted curve

▫ Easily reverse legend order or drag and drop to arrange legend entries in multiple columns

▫ In-place editing of text labels with Character Map access, TrueType fonts, bold, underline, italic, Greek, super/subscript or both, increase/decrease size, rotate, date/time stamp

▫ Support multi-line spacing

▫ Easily insert import file header information and other metadata into text labels

▫ Add symbol shapes with the Origin TrueType font

▫ Unicode support for text labels

▫ Customize legend to show desired data such as long name, comments, book/sheet name, and/or user-defined parameters in a customized format

▫ Automatically create a single legend for all layers in a graph

▫ Update or reconstruct legend at layer or page level

▫ Legend displays individually edited data points

▫ Link to LabTalk variables and specify the level of % and $ substitution in the Programming Control dialog for legends

Error Bars

▫ Display error bar as % of data, standard deviation, or from a dataset

▫ Asymmetric error bar support

▫ Specify X and/or Y and/or Z error bar

▫ Error bar support on 3D graphs

▫ Control error bar color, line width and cap width

▫ Error bars can go up to or through symbols

▫ Set as absolute or relative error bar

▫ Skip points allowed for error bars

▫ Connect error bars with lines and fill the area under the lines

▫ Support scaling factor when adding error bars to graph using standard deviation of data

▫ Support for adding error bar to graph using square root of data

▫ Auto update of error bar columns when source data changes

Axes

- Apply axis settings to other axes or customize multiple axes together
- Double-log reciprocal axis scale, ln(-ln(1-x)), for Weibull plot
- Custom color support for axes and grid Lines
- Technical types: Linear, log10, probability, probit, reciprocal, offset reciprocal, logit, ln, log2, polar, Smith®, double-log reciprocal (ln(-ln(1-x)))
- Discrete axis scale type to support skipping weekend and holidays in financial plots
- Scale options: set rescale mode to normal, auto, or fixed from/to; specify increment, # of major ticks, # of minor ticks, first tick; reverse axis scales; user-defined axis scale type
- Control color, line style, and thickness
- Axis titles use long name and units from worksheet
- Options of axis title to be in the beginning/middle/end of axis
- Offset Axes - Multiple based on percent or axis position
- Grid Lines: Control color, line style, thickness, and density of major and minor grid lines for X, Y, and Z axes
- Multiple reference lines and shading between, in 2D graphs
- Add Reference Lines using statistical functions or custom expression
- Multiple axis breaks and individual control for each break
- Axis Break: Define gap, break region, break position along axis, scale type and increment before/after break, supports proportional unit for each segment
- Frame Options: 2D or 3D axis graph page
- Display layer icons on visible axes for each layer
- Add axis scrollbar to zoom or pan graph
- Manually specify tick marks and tick labels
- Multiple Y axes customization
- Flexible ternary scale
- Zoom or scroll in both X and Y inside graph layer using keyboard or mouse
- Zoom preview of fitted curve and residual plots in NLFit dialog
- Supporting for arbitrary zero and direction (CW/CCW) for polar graphs
- Support setting additional line values to plot column/bar from non-zero baseline
- Arrows at Axis begin or end, can be put outside of layer frame

Layers

- Up to 1024 layers per page
- Align and size multiple layers and text using Object Edit toolbar
- Customize properties across graph layers
- Support for naming layers
- Merge multiple graph pages (select graphs using Graph Browser)
- Add and arrange multiple layers using Layer Management dialog
- Create inset layers
- Link axes: specify formula for relationship
- Align layers at specified value
- Set layer width or height by common scale for multiple layers
- Support layer title

Tick Labels

- Basic Types: numeric, text from dataset, time (includes IRIG), date, month, day of week, column headings, indexed from dataset, categorical (binned text data)
- Special Types: Specify a user-defined formula or draw from a column of values
- Major and minor tick labels by count, increment, dataset, space separated list, or column label rows
- Minor tick labels display only at specified indices
- Axis tick label table support
- Leader lines for special tick labels
- Control the direction (in, out, both, none) and length of major and minor tick marks for X, Y, and Z axes
- Control color, font, size, number of decimal places, rotation, offset, display of individual special tick labels (first, last, and custom)
- Align, rotate, offset, show/hide
- Wrap text in tick labels
- Include minor tick labels
- Apply a divide by factor
- Include a prefix and suffix
- Include plus and minus signs
- In-plane axis title and tick labels for 3D graphs

Graph Annotation

- Add text, including plain text or text from data or metadata with rich text format
- ALT + drag a dynamic label object from point to point

- Add graphic objects such as line, polyline, freehand draw tool, arrows, circle, oval, square, rectangle, polygon, freehand region, etc.
- Add special characters, superscript, and subscript notation
- Add equations to your graph (MathType or LaTeX App)
- Add an image from external file
- Add tables to graphs, table cells may be linked to other worksheet and report cells
- Decimal separator for labels and annotations can be controlled at Graph Page level
- Copy-paste cells from a worksheet to create a table
- Add XY Scaler, asterisk brackets, date/time stamp, and project path

Editing Objects

- Line types: straight, poly line, freehand
- Line styles: solid, dashed, dot
- Begin/end arrow control
- Shapes: rectangle, ellipse, polygon, region
- Fill types: hollow, fill color, fill pattern
- Transparency support for shapes and lines
- Resize/rotate/skew all lines/shapes
- Align, evenly distribute, send to front/back , group/ungroup objects
- Manually move 3D planes along the axis direction
- Ability to shift 3D plot in Z direction using percent of scale range
- Lighting effect for 3D surface and wall plot
- Change light source direction in 3D graph by pressing S key and dragging mouse
- Mesh for 3D surface
- Move, rotate and resize 3D graphs in an intuitive way
- Control alignment of ticks, tick labels and axis titles
- Leader line for data labeling in 3D graphs
- Show symbol in 3D XYY Waterfall, Walls and Ribbons
- Different bar shapes are supported for 3D bars

Data Analysis

Overview

- Standardized analysis tools with tree structure for settings
- Analysis markers to indicate range used for analysis
- Preview of results in most analysis dialogs
- Analysis report sheets with collapsible tables

- Ignore hidden columns/plots from analysis

Recalculation

- Manually or automatically update the results of any previously run analysis operation when data or parameters change

Globally change the default recalculation mode for all analysis dialogAnalysis Themes

- Save settings of analysis dialogs to Theme for repeat use
- Access saved analysis Themes from fly-out menu or script

Analysis Templates

- Save workbook as Analysis Template™, with desired analysis routines and custom settings, including custom report sheets to present results
- HTML/Markdown-based reports for repeat Analysis and publishing
- Re-use Analysis Template™ manually or in Batch Processing mode, to analyze multiple files or datasets

Analysis Results

- Keep analysis results organized in same workbook as source data
- Embed graphs and analysis to create custom reports
- Create separate reports per dataset for same analysis routine, or combine in one results sheet
- Report results to Results Log to establish analysis history
- Residual Analysis (linear, polynomial, multiple regression, nonlinear fitting)- 4 residual types (regular, standardized, Studentized, Studentized deleted) and 6 plot types
- Customize default digits for analysis output in each tool
- Separate numeric display for analysis report sheets
- Adjust footnote size in built-in analysis report

Batch Processing

- Batch processing data from different data source such as, data files, XY ranges, XYZ ranges, worksheets , columns and matrices
- Clone current project for repeat analysis
- Batch processing with summary report using Analysis Templates™
- Link analysis template to a Microsoft Word template for report creation, and combine all word files into one after batch processing

- Import multiple files into sequential worksheets in your Analysis Template™
- Execute LabTalk script before or after each file, or at end of the batch process
- Block recalculation for operation when click Recalculate button
- Batch peak analysis of multiple datasets using Theme (PRO)
- Repeat analysis on all plots in graph, or all columns in worksheet
- "Copy-paste" fitting operations to selected curves
- Copy - paste formula and labels between columns
- Generate gadget output for all data plots in the graph
- Clone workbook/worksheet during import for batch processing
- Include graph images in Summary sheet and ability to recreate workbook for specific file entries.

Data Exploration

- Data Point Tooltip: Mouse over data points in graph to view useful information of data point
- Data Highlighter: Highlight data points in all open graph that originate from same row of worksheet
- Plot Highlighting: When selecting a plot in graph or in Object Manager, other plots fade away, corresponding worksheet column is highlighted
- Read data point coordinates, screen coordinates
- Inspect data point values/distances on/between curves using customizable data information display window and Cursor tool
- Graphically attach data labels with pinned connecting lines to individual data points
- Zoom in and pan simultaneously on graphs, worksheets, matrices and layouts
- Support Press Mouse Wheel in worksheet to scroll
- Launch separate graph with movable zoomed in region, supporting multiple overlapped layers
- Vertical and horizontal scroll bars to scroll and pan
- Move individual data points graphically
- Mask/Unmask data points on all or active data plot
- Data/Mask selection can be restricted to active plot or expanded to all plots within selection window
- Control display of masked data at Graph Page level
- Toolbar for data markers and locks

Data Manipulation

Setting Column/Cell Values

- Simple column formula notation is similar to Excel or Google Sheets
- Set single or multiple column formula
- Set cell formula for Data and Label Row cells. Extend by dragging. Fixed referencing supported.
- Directly edit column label row formula to set column values
- Function and syntax help on Status Bar and as Smart Hint
- Search and insert functions
- Large collection of categorized functions for setting column values, including date/time and string functions
- Easily define variables from meta data and other books and sheets for use in setting column values
- Auto update Set Column Values output when source data changes
- Set column values with LabTalk functions
- Subrange notation support in column formula
- Copy and paste column formula
- Color-pairing of formula parentheses
- Option to keep text when column values are transformed using formula
- Auto fill Column Label Row contents to the right

Worksheet

- Data filter to find and work with a subset of worksheet
- Save data filter info with the Copy Column To or Pivot Table operations
- Filter columns by label row
- Sort columns/worksheet, including support for nested sort
- Sort columns by column label row data
- Filter columns by Label Row
- Trim missing values in a worksheet
- Fill worksheet with row numbers, random numbers or uniform values/patterned data
- Remove duplicate data in a column
- Find and replace numeric and text values
- Unstack and stack worksheet columns using grouping variables
- Splitting columns by specified separator or interval
- Join multiple worksheets into a single worksheet with different conditions
- Pivot Table: Possible to have more than one source of column or row

- Data reduction: Remove duplicate values, remove every Nth point or remove points at a specified X increment (PRO). Reduce columns tool, remove/combine duplicated rows
- Extract worksheet data by specified condition or random sample
- Normalize data across multiple columns, or combine multiple dataset as one to normalize
- Merge XY data according to X values (worksheet only)
- Convert XYZ worksheet data to matrix using XYZ gridding: regular, sparse, random - Renka-Kline, Shepard, thin plate spline, kriging, 2D B-spline
- Convert worksheet data directly to matrix
- Convert matrix data to XYZ worksheet data
- Convert matrix data directly to worksheet
- Shrink and expand matrix
- Transpose data, and paste transpose
- Split a worksheet into multiple worksheets by number of columns/rows, or by column label information
- Ability to force Text & Numeric datasets to show numeric values as text elements

Curve

- Average multiple curves
- Translate curves (vertical/horizontal)
- Subtract straight line or reference data
- Change X, change Y or change worksheet data

Gadgets

- Gadgets for quick and easy exploratory analysis of a region of interest (ROI) on graphed data
- Results displayed on graph, and updated immediately when ROI object is moved
- Save custom settings as Theme for repeat use
- Batch analysis - apply analysis to all curves in a graph
- Output gadget results to a tree variable
- Toggle display of all ROI boxes with one button click

Quick Fit Gadget

- Easy fitting of graphed data using ROI
- Fit parameter values update as ROI is moved on graph
- Fit multiple datasets and send results to a consolidated report sheet
- Easily change fitting function and other settings
- Easily switch to NLFit for complete control
- Standard Error is reported for derived parameters

Other Gadgets

- 2D Integration Gadget (PRO): display 2D peak parameters with control of baseplane, results including the volume, surface area, FWHM for x and y, centroid for x and y within a ROI
- Statistics: Basic statistics, including display of mean and standard deviation lines inside ROI
- Integration: Peak parameters with choices for baseline, shading area under one or mulitple curves
- Rise Time (PRO): Compute rise- or fall-time with options for setting high and low levels
- FFT: View frequency spectrum of data inside ROI in a separate window
- Cluster (PRO): Basic statistics and simple operations (copying, clearing, deleting and masking) to data points, setting color of selected region of plot, adding or clearing categories inside or outside ROI.
- Differentiation: Graph the desired order derivative curve of the input data set specified by a ROI
- Interpolation: Interpolate a dataset within an ROI using one of three methods (linear, cubic spline and cubic b-spline), and display the new curve
- Quick Peaks: Pick a peak within the ROI, integrate it, and perform fitting to it.
- Quick Sigmoidal Fit Gadget for fitting selected data using a sigmoidal function
- Vertical Cursor Gadget for reading X and Y coordinate values for data points on stacked panel plots, support to compare two cursors
- Intersection Gadget for calculating the intersection points of data plots in the input curves
- Curve Translate: Move the active curve vertically or horizontally. Image/Contour profile: profiling image or contour plot along horizontal, vertical or arbitrary directions

Curve Fitting

General Fitting Features

- Analysis report sheets with collapsible tables
- Analyze multiple datasets independently (consolidated or separate reports) or as a concatenated dataset
- Weighted Fitting with multiple weighting methods
- Confidence/prediction bands
- Fit Parameters: value, standard errors, LCL/UCL, t-value, prob>|t|, CI half-width
- Fit Statistics: Number of points, DOF, r value, residual sum of squares, r-square (COD), adjusted r-square, root-MSE (SD), norm of residuals, ANOVA table, covariance matrix, correlation matrix

- Residual analysis (linear, polynomial, multiple regression, nonlinear fitting)- 4 residual types (regular, standardized, studentized, studentized deleted and 5 plot types
- Generate result using same X values as the original data, uniform linear, or uniform log X values
- Find X/Y values for new Y/X values based on fit parameters
- Copy and paste operation for fitting tools

Linear and Polynomial Fitting

- Linear fit: Fix intercept or slope
- Linear fit: Support for x-error values (PRO)
- Polynomial fit: Fix intercept
- Apparent fit
- Confidence bands, prediction bands, confidence ellipse

Multiple Dataset Linear Fitting

- Partial leverage plot in multiple regression
- Fix intercept

Nonlinear Fitting

- Nearly 200 built-in fitting functions
- Organize all fitting functions by category in an intuitive dialog, with equation and sample curve preview
- Create and edit user-defined fitting functions
- Search fitting functions (FDF) in dialog
- Define derived parameters that are computed using fit parameter values
- Global fitting with sharing of parameters
- Multiple peak fitting with auto initialization
- Automatic parameter initialization for built-in function, and support for adding initialization by value or by code, for user-defined functions
- Simulate curve or surface using desired function and parameter values
- Levenberg-Marquardt and simplex iteration algorithms
- Weighting - 13 methods including several iteratively reweighted least squares methods
- Control number of iterations, tolerance, derivative delta
- Fix parameter values, set bounds, or linear constraints
- Provide selection of parameter initialization formula for user-defined fitting functions
- Replicate (concatenated) data fitting - Fits all data, not an average, then presents result as average curve with SE or SD error bars
- Display parameter values in date/time formats.

- Fit Comparison (PRO): Compare two datasets fit with one model, or two models fit to same dataset (AIC,BIC and F-test
- Post-fit ranking of multiple functions by category (PRO)
- Surface (XYZ or matrix) fitting (PRO)
- Rotated 2D Gaussian function for surface fitting (PRO)
- Find-Z tool for nonlinear surface/matrix fitting (PRO)
- Fitting function builder to help to define new fitting functions
- Fit multiple peaks on surface using replicas (PRO)
- Orthogonal distance regression for fitting implicit/explicit functions (PRO)
- Standard error reported for derived parameters
- Specify X data range From and To values using X values for fitted curve
- Custom X data range for fitted curve
- Use the specified row range/X range to order data during the analysis
- Ability to fit one dataset at a time when performing independent fit on multiple datasets. Ability to copy fit values from one dataset to all other datasets. Fitting with integral function in NLFit
- Improved fitting speed for LabTalk script based fitting functions

Baseline and Peak Analysis

Baseline

- Create baseline by multiple methods including straight line, user-defined anchors, existing dataset or by script

Peak Finding

- Find and mark positive and negative peaks
- Multiple methods for peak detection
- Automatically set peak area/amplitude bounds based on peak direction

Peak Integration

- Integrate peaks with fixed or arbitrary window width for each peak

Peak Fitting (PRO)

- Find and fit multiple peaks
- Multiple methods for peak finding including hidden peak finding
- Use built-in or user-defined peak fitting functions
- Assign same or different functions to different peaks
- Support for linear constraints and bounds on parameters

- ▫ Batch peak analysis using pre-defined Theme
- ▫ Sequential initialization of parameter values in batch peak analysis

Signal Processing

- ▫ Correlation
- ▫ Coherence (PRO)
- ▫ 2D correlation (PRO)
- ▫ Convolution and deconvolution
- ▫ Create upper and lower envelopes for curves (PRO)
- ▫ Decimation to reduce data (PRO)

Transforms

- ▫ FFT/IFFT
- ▫ STFT (PRO)
- ▫ Hilbert Transform (PRO)
- ▫ 2D FFT/2D IFFT (PRO)
- ▫ Image Profiling: simple line profiling: horizontal, vertical, straight line

Filtering

- ▫ FFT Filter: low pass, high pass, band pass, band block, noise threshold
- ▫ IIR filter design (PRO)
- ▫ 2D FFT Filter (PRO): support 3 types of filter windows: Ideal, Gaussian, Butterworth, Blackman, 4 filter types for each filter window: low-pass, high-pass, band-pass, band-lock, and filter defined using spectral power threshold

Smoothing

- ▫ Smoothing: Savitzky-Golay, adjacent averaging (running average), FFT filter smoothing, percentile filter (including median filter), LOESS/LOWESS

Wavelet Analysis

- ▫ Decompose (discrete wavelet transform - DWT) (PRO): 1D and 2D
- ▫ Reconstruct (inverse DWT - IDWT) (PRO): 1 and 2D
- ▫ Continuous transform (PRO)
- ▫ Wavelet smooth (PRO)
- ▫ Denoise (PRO)

Image Processing

Image Adjustment

- ▫ Color Adjustments: intensity (brightness, contrast, gamma), color (hue, invert, saturation, color balance)
- ▫ Equalizer: Histogram equalize, histogram contrast, auto level

Conversion

- ▫ Select region of interest: cut, copy, create new matrix
- ▫ Channels (PRO): RGB split, RGB merge
- ▫ Color resolution conversions: Color to gray, color to B/W (Binary, Dynamic Binary (PRO), thresholding (PRO)
- ▫ Image scale: Reset X/Y coordinates (PRO)

Geometric Transformations

- ▫ Geometric transforms: Rotate, flip (H/V), shear, auto trim, crop, resize, offset

Spatial Filters

- ▫ Spatial filters: Blur (average, Gaussian), noise (add noise, median), sharpen (sharpen, unsharp mask), edge detect, user filter (PRO)

Arithmetic Transform

- ▫ Lookup Table (PRO): function LUT, user defined
- ▫ Arithmetic Transforms (PRO): pixel logic, math function, image combine, alpha blend, background subtract, extract to XYZ, morphological filter, replace background, subtract interpolated background
- ▫ Color detect (PRO): detect, segment, replace

Mathematics

Simple Math

- ▫ Simple math between datasets: =, +, -, x, ÷
- ▫ Subtract reference data or straight line
- ▫ Normalization across single/multiple columns or curves

Interpolation/Extrapolation

- ▫ 1D Interpolation/Extrapolation - linear, cubic spline, b-spline, Akima spline
- ▫ Interpolate XY dataset to find Y values based on an existing set of X values
- ▫ 2D Interpolation - nearest, bilinear, bicubic, spline, biquadratic
- ▫ Trace interpolation
- ▫ 3D interpolation

Calculus

- ▫ Calculus: integration and differentiation including Savitzky-Golay smoothing during differentiation

Matrix Mathematics

- ▫ Matrix inverse
- ▫ Compute surface area of matrix data (PRO)

Statistics

Descriptive Statistics

▫ Column and row statistics (both support grouping)

▫ Analyze input data independently (consolidated or separate reports) or combined

▫ Support for grouping and weighting with row/column statistics and many other statistical analyses

▫ Flat sheet output for column statistics

▫ Moments: N total, N missing, sum, mean, mode, geometric mean, geometric SD, upper/lower CI of the mean, standard seviation (SD), SD*2, SD*3, standard error of mean, variance, coefficient of variation, Skewness, kurtosis, mean absolute deviation, Corrected or uncorrected sum of squares, sum of weights (statistics on columns only)

▫ Quantiles: minimum, index of minimum, 1st quantile (Q1), median, 3rd quantile (Q3), maximum, index of maximum, interquartile range (IQR = Q3 - Q1), range (maximum - minimum), custom percentile(s)

▫ Extreme values

▫ Variance divisor of moment: DF, N, WDF, WS, WVR

▫ Interpolation of quantiles: weighted average left, Weighted average right, nearest neighbor, empirical distribution (None), empirical distribution with average, Tukey Hinges

▫ Cross Tabulation (PRO)

▫ Distribution fit (PRO)

▫ Frequency count

▫ Discrete frequency

▫ 2D Binning (incl. support for periodic data)

▫ Normality Tests: Shapiro-Wilk, Kolmogorov-Smirnov, Lilliefors, Anderson-Darling, D'Agostino-K squared, and Chen-Shapiro

▫ Correlation(PRO): Pearson r, Spearman r, and Kendall Coefficients

▫ Partial Correlation (PRO)

▫ Grubbs test and Q-test to detect outliers

Parametric Hypothesis Tests

▫ One- and two-sample t-tests (on rows or on columns or summarized data)

▫ Paired sample t-test (on rows or on columns or summarized data)

▫ Welch corrected t-test

▫ One sample chi-square test for variance (PRO)

▫ Two sample F test for variance (PRO)

▫ Confidence levels for one sample chi-square variance (PRO)

▫ Confidence levels for two sample F variance (PRO)

▫ Indexed or raw data

▫ One- and two-proportion testing (PRO)

ANOVA

▫ One-way/Two-way ANOVA

▫ Three-way ANOVA (PRO)

▫ One-way/Two-way repeated measures ANOVA (PRO) (balanced or unbalanced data)

▫ Indexed or raw data

▫ Means comparison tests: Bonferroni, Scheffé, Tukey, Dunn-Sidak, Dunnett (repeated measures only) , Fisher LSD, Holm-Bonferroni, Holm-Sidak

▫ Tests for equal variance: Levene, Levene Square, Brown Forsythe

▫ Power analysis

Nonparametric Hypothesis Tests

▫ Wilcoxon Signed Rank Test (PRO)

▫ Mann-Whitney Test (PRO)

▫ Wilcoxon Matched Pair Test (PRO)

▫ Kruskal-Wallis ANOVA (PRO)

▫ Friedman ANOVA (PRO)

▫ Sign Test (PRO)

▫ Kolmogorov-Smirnov Two-Sample Test (PRO)

▫ Mood's Median Test (PRO)

▫ Indexed or raw data

Multivariate Analysis

▫ Principal Component Analysis (PRO)

▫ Hierarchical Cluster Analysis (PRO)

▫ K-Means Cluster Analysis (PRO)

▫ Discriminant Analysis (PRO)

▫ Canonical Discriminant Analysis (PRO)

▫ Partial Least Squares Regression (PRO)

Survival Analysis

▫ Kaplan-Meier Analysis (PRO)

▫ Cox Proportional Hazards Model (PRO)

▫ Survival Function Comparison (PRO): Log-rank, Breslow, Tarone Ware

▫ Weibull Fit (PRO) :Perform Weibull fit and plot probability with confidence limits

ROC Curves

▫ ROC Curves (PRO)
▫ Support test direction, including positive vs high (larger test measurement values indicates more positive test) and positive vs. low (smaller test measurement values indicates more positive test)
▫ Output cut off values

Power and Sample Size

▫ One/Two Sample t-test (PRO)
▫ Paired-Sample t-test (PRO)
▫ One Way ANOVA (PRO)
▫ One/Two-Proportions test (PRO)
▫ One/Two Variance test (PRO)

Programming

LabTalk Scripting

Overview

▫ High-level, full-featured, easy-to-learn programming language
▫ More than 15 years of language stability and progressive development
▫ Access to Origin objects and operations to easily automate or customize Origin
▫ Detailed documentation and practical examples shipped with Origin
▫ Wiki site available to offer timely, updated documentation
▫ Large Origin user community participating in LabTalk programming forum
▫ Colored pairs of parentheses in function formula

LabTalk Features

▫ A variety of basic data types including numeric (integer, double, constant), dataset, string, string array, tree
▫ Variables can be strongly and dynamically typed
▫ Range notation for flexible data access
▫ Organize script by sections or files
▫ Define variables with different scopes: project, session, local
▫ LabTalk Variable Viewer to view, update, or delete variables including support for tree variables
▫ System variables for controlling various options in Origin

▫ Internal and external objects with methods and properties
▫ C-like programming with loops (repeat, loop, for), and decision structures
▫ Define macro with arguments
▫ Support for event-driven execution
▫ Easy increment of objects using ": " operator and "end" keyword
▫ Interactively execute scripts
▫ Debug script using Code Builder
▫ Protect multiple lines of code using "{ " and "}"
▫ Over 60 built-in commands for data manipulation, display control, and user interface
▫ LabTalk command to convert C and CPP files to encrypted OCZ files for distribution
▫ Built-in immediately programmable GUI construction
▫ Built-in functions for string manipulations, dates and times processing
▫ Built-in functions for graph object properties
▫ Create user-defined function
▫ Add or customize menu commands
▫ Create buttons to execute any built-in or user-defined task
▫ Perform batch processing
▫ Easy access to Origin C functions from script
▫ Access to hundreds of built-in X-Functions for performing various tasks in Origin
▫ System Variables dialog to customize system variables and save them as default settings

Origin C

Overview

▫ Code builder for building and debugging Origin code created in either LabTalk or Origin C
▫ Using code builder to manage Origin C files in packages (OPX)
▫ Advanced programming language that supports ANSI C and some C++, C# features
▫ Easy access to Origin objects and operations to automate and customize Origin
▫ X-Functions framework providing a structured programming environment for building Origin tools
▫ Detailed documentation and practical examples shipped with Origin
▫ Wiki site available to offer timely, updated documentation

▫ Large Origin user community participating in Origin C programming forum

Origin C Features

▫ Origin C supports a nearly complete ANSI C language syntax

▫ Encrypt Origin C files (OCZ)

▫ Supports a subset of C++ features including mid-stream variable declarations, overloaded functions, built-in and user-defined classes, references to variables and default function arguments

▫ Supports a subset of C# features including collections of objects, *foreach* and *using* statements

▫ Support for HTML control and call JavaScript to build dialogs

▫ Built-in C++ classes for programmatic access to most Origin objects

▫ Built-in immediately programmable user interface development

▫ Immediate vector, matrix, tree structures programming

▫ Immediate access to all routines in the 64 bit NAG® Mark 26.1 function libraries for a wide range of mathematical and statistical functions

▫ Built-in global functions organized in 25+ categories

▫ Create complex user-defined curve fitting functions for use in Origin's advanced curve fitting tool

▫ Support error and exception handling using Throw, Try, and Catch statements

▫ Support for database access

▫ Easy integration with LabTalk scripts

▫ Hundreds of built-in X-Functions can be easily accessed and extended

▫ Create user-defined X-Functions

▫ Call external DLLs created with other languages such as C, C++ and Fortran

Origin as Automation (COM) Server

▫ Access Origin as an automation server from client applications such as Microsoft® Excel®, National

Instruments™ LabVIEW™, or any COM-capable client application

▫ Run Origin visible or hidden

▫ Send data and commands to Origin for graphing and analysis tasks. Fetch results back to client application

▫ Utilize Origin's Analysis Template capability to automate routine tasks

▫ Large collection of classes to access various Origin objects and properties

▫ Run LabTalk script or Origin C code

Integrated Python Environment

▫ Run Python commands in the Script Window

▫ Execute Python files with LabTalk commands

▫ Python 2.x and 3.x support

▫ PyOrigin module to access Origin objects from Python

▫ Python Package OriginExt to Access Origin Functionality from External Python through COM.

▫ Running R in Origin

▫ R Console and Rserve Console to run R commands within Origin or exchange data between Origin and R

▫ Run R commands or execute R files with LabTalk commands

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