

## Comparison of Origin and OriginPro

OriginPro provides all of the features of Origin, plus additional analysis tools and capabilities. The following tables provide comparisons between Origin and OriginPro in such areas as curve fitting, peak analysis, statistics, signal analysis, and image handling.\*

Curve Fitting		Origin	OriginPro
<b>LINEAR AND POLYNOMIAL FITTING</b>	Linear Regression	✓	✓
	Linear Fit with X Error		✓
	Confidence Ellipse for Linear Fit	✓	✓
	Polynomial Regression	✓	✓
	Multiple Linear Regression	✓	✓
	Partial Leverage Plots in Multiple Regression	✓	✓
	Residual Analysis	✓	✓
<b>NONLINEAR FITTING</b>	Fitting Multiple Datasets	✓	✓
	Built-in Fitting Function and User-defined Fitting Function	✓	✓
	Parameter Initialization and Derived Parameter Definition	✓	✓
	Bounds and Constraints	✓	✓
	Weighted Fitting	✓	✓
	Fitting with Y Error	✓	✓
	Fitting with X and Y Errors (Orthogonal Regression)		✓
	Global Fit with Parameter Sharing	✓	✓
	Fitting Replica Data	✓	✓
	Residual Analysis	✓	✓
	Fitting with Implicit Functions (Orthogonal Distance Regression)		✓
	Fitting Comparison		✓
	Fit and Rank Multiple Models		✓
	Surface Fitting		✓

Mathematics		Origin	OriginPro
<b>SIMPLE MATHEMATICS OPERATIONS</b>	Simple Mathematics Operations on or Between Datasets	✓	✓
	Set Cell, Column or Matrix Values by Using Mathematics Operations	✓	✓
	Normalization	✓	✓
<b>INTERPOLATION AND EXTRAPOLATION</b>	1D Interpolation and Extrapolation	✓	✓
	Interpolation and Extrapolation of Y From X	✓	✓
	Trace Interpolation on XY Data	✓	✓
	Trace Interpolation on XYZ Data	✓	✓
	2D Interpolation and Extrapolation	✓	✓
<b>DIFFERENTIATION AND INTEGRATION</b>	3D Interpolation	✓	✓
	Numerical Differentiation	✓	✓
	1D Numerical Integration	✓	✓
<b>AREA CALCULATION</b>	2D Volume Integration		✓
	Polygon Area	✓	✓
	XYZ Surface Area		✓
<b>OTHERS</b>	Matrix Surface Area		✓
	Average Multiple Curves	✓	✓
	Inverse of a Matrix	✓	✓

\*To view the complete list of comparison tables go to: [originlab.com/ProductComparison](http://originlab.com/ProductComparison)

Statistics	Origin	OriginPro	
<b>DESCRIPTIVE STATISTICS</b>	Basic Descriptive Statistics	✓	✓
	1D and 2D Frequency Counts	✓	✓
	Correlation Coefficient		✓
	Partial Correlation Coefficient		✓
	Cross Tabulation		✓
	Discrete Frequency	✓	✓
	Distribution Fit		✓
	Normality Test (Shapiro-Wilk, Lilliefors, Kolmogorov-Smirnov, Anderson-Darling, D'Agostino-K Squared, Chen-Shapiro)	✓	✓
	Statistics Charts: Histogram, Box Chart, Scatter Matrix, QC Chart, Probability Plot, Q-Q Plot, and Pareto Chart	✓	✓
	Grubbs Test and Q-test to Detect Outliers	✓	✓
<b>HYPOTHESIS TESTING</b>	One Sample and Two-Sample t-Test, Pair-Sample t-Test	✓	✓
	Two Sample and Paired-Sample t-Test on Rows		✓
	One Sample and Two Sample Hypothesis Tests for Variance		✓
	One and Two-Proportion Test		✓
<b>ANALYSIS OF VARIANCE</b>	One Way ANOVA, Two Way ANOVA	✓	✓
	Three Way ANOVA		✓
	ANOVA: Mean Comparison (Tukey, Bonferroni, Scheffe, Dunn-Sidak, Fisher LSD, Holm-Bonferroni, Holm-Sidak)	✓	✓
	One Way and Two Way Repeated Measure ANOVA		✓
<b>NONPARAMETRIC TESTS</b>	Sign Test		✓
	Wilcoxon Test for One Sample and Paired Sample		✓
	Two Sample Kolmogorov-Smirnov Test		✓
	Mann-Whitney Test		✓
	Kruskal-Wallis ANOVA		✓
	Mood's Median Test		✓
	Friedman ANOVA		✓
<b>MULTIVARIATE ANALYSIS</b>	Principal Component Analysis		✓
	Cluster Analysis		✓
	Discriminant Analysis		✓
	Canonical Discriminant Analysis		✓
<b>SURVIVAL ANALYSIS</b>	Partial Least Squares		✓
	Kaplan-Meier Estimator		✓
	Test Equality of Survival Functions (Log-Rank, Breslow and Tarone-Ware)		✓
	Cox Proportional Hazard Model		✓
<b>POWER AND SAMPLE SIZE</b>	Weibull Fit		✓
	One, Two and Paired-Sample t-Test, One Way ANOVA, One and Two-Proportion Test, One and Two-Variance Test		✓
<b>ROC CURVE</b>	ROC Curve		✓

Peak Analysis	Origin	OriginPro	
<b>PEAK ANALYSIS</b>	Baseline Detection	✓	✓
	Baseline Subtraction	✓	✓
	Peak Finding	✓	✓
	Peak Integration	✓	✓
	Peak Fitting		✓
	Fit Baseline with Peaks		✓
	Fit Individual Peaks with Different Fitting Functions		✓
	Batch Peak Analysis		✓
Signal Analysis	Origin	OriginPro	
<b>SMOOTHING AND FILTERING</b>	Smoothing using Savitzky-Golay Filter, Adjacent Averaging, FFT Filter, and Percentile Filter	✓	✓
	FFT Filters: Low Pass, Low Pass Parabolic, High Pass, Band Pass, Band Block, and Threshold	✓	✓
	IIR Filter Design		✓
<b>FAST FOURIER TRANSFORM (FFT)</b>	FFT with Basic Options	✓	✓
	2D FFT and 2D FFT Basic Filtering		✓
	Short-Time Fourier Transform (STFT)		✓
<b>WAVELET ANALYSIS</b>	Discrete Wavelet Transform (DWT) and Inverse Discrete Wavelet Transform (IDWT)		✓
	Wavelet Smoothing		✓
	Wavelet Denoising		✓
	Continuous Wavelet Transform (CWT)		✓
	Evaluation of Continuous Wavelet Function		✓
<b>OTHERS</b>	Convolution and Deconvolution	✓	✓
	Coherence		✓
	1D Correlation	✓	✓
	2D Correlation		✓
	Hilbert Transform		✓
	Signal Envelope		✓
	Signal Decimation		✓
	Rise and Fall Time Analysis		✓

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Data Manipulation		Origin	OriginPro
REORGANIZATION	Sort Worksheet or Columns	✓	✓
	Stack and Unstack Columns	✓	✓
	Pivot Table	✓	✓
	Split and Append Worksheet	✓	✓
TRANSFORMATION	Converting XYZ Data to a Matrix	✓	✓
	Transpose Worksheet or Matrix	✓	✓
	Shrink or Expand a Matrix	✓	✓
EXTRACTION AND REDUCTION	Worksheet Query	✓	✓
	Reduce Duplicate X Data	✓	✓
	Reduce Data by Skipping Every N Points	✓	✓
	Reduce Data to Evenly Spaced X	✓	✓
	Reduce XY Data by Group	✓	✓
OTHERS	Find and Replace Numeric and Text Values	✓	✓
	Translate Curve Vertically or Horizontally	✓	✓
	Data Filter for Worksheets	✓	✓
	Select or Hide Columns in Worksheet by Column Label	✓	✓
Gadget	Origin	OriginPro	
GADGETS	Surface Integration Gadget		✓
	Global Vertical Cursor Gadget Across Graphs	✓	✓
	Intersect Gadget	✓	✓
	Quick Sigmoidal Fit Gadget	✓	✓
	Cluster Gadget		✓
	Quick Peaks Gadget	✓	✓
	Differentiate and Interpolate Gadget	✓	✓
	Quick Fit Gadget	✓	✓
	Rise Time Gadget		✓
Integrate, FFT and Statistics Gadget	✓	✓	

APPS		Origin	OriginPro
CURVE FITTING	Global Fit with Multiple Functions		✓
	3D Smoother		✓
	Fit Convolution		✓
	Rank Models		✓
	Constrained Multiple Regression		✓
	Polynomial Surface Fit		✓
	Sequential Fit		✓
	Piecewise Fit		✓
	Enzyme Kinetics		✓
	General Linear Regression		✓
	Composite Spectrum Regression		✓
	Cyclic Voltammetry		✓
	Find a Fitting Function	✓	✓
	2D Smoother	✓	✓
	Simple Fit	✓	✓
	Compare Linear Fit Parameters and Datasets	✓	✓
PEAK ANALYSIS	Global Peak Fit		✓
	Peak Deconvolution		✓
	Align Peaks	✓	✓
MATHEMATICS	Equations Solver		✓
	Curvature Radius	✓	✓
	Tangent	✓	✓
	Tafel Extrapolation	✓	✓
	Distance Between Two Points	✓	✓
	Level Crossing	✓	✓
SIGNAL PROCESSING	Independent Component Analysis		✓
	Dynamic Time Warping		✓
	Simple pCLAMP Analyzer		✓
	Time-Frequency Analysis		✓
	Fourier Self-Deconvolution		✓
	FFT Examiner		✓
	White Noise	✓	✓

Note: New Apps are released frequently. Please visit [originlab.com/Apps](http://originlab.com/Apps) for the most up-to-date list.

APPS (con't)		Origin	OriginPro
STATISTICS	Design of Experiments		✓
	Gaussian Mixture Models		✓
	Factor Analysis		✓
	Simple Time Series Analysis		✓
	Logistic Regression		✓
	Principal Component Analysis for Spectroscopy		✓
	Advanced Principal Component Analysis		✓
	Hottelling's T-squared Test		✓
	Post-hoc Analysis for Nonparametric Tests		✓
	Hurst Exponent	✓	✓
Statistics Advisor	✓	✓	
GRAPH CUSTOMIZATION	Color Editor	✓	✓
	LaTeX	✓	✓
	Google Map Import	✓	✓
	Maps Online	✓	✓
	Colormap for Map Data	✓	✓
	Layer Stack Manager	✓	✓
GRAPHING	Means Plot		✓
	Manhattan Plot for GWAS (Genome-Wide Association Studies)		✓
	Image Stack Profile		✓
	Heat Map with Dendrogram		✓
	Graph Maker	✓	✓
	Batch Plotting	✓	✓
	Voronoi-Diagram	✓	✓
	Chromaticity Diagram	✓	✓
	Paired Comparison Plot	✓	✓
	Kernel Density for Polar and Ternary	✓	✓
	3D Wall Profile	✓	✓
	Plot Sub MatrixView	✓	✓
	Log Histogram	✓	✓
	Zoomed Inset	✓	✓
	Treemap Plot	✓	✓

APPS (con't)		Origin	OriginPro
DATA PROCESSING	Data Slicer	✓	✓
	OPJ Packer	✓	✓
	Toolbar Maker	✓	✓
	OPJ Searcher	✓	✓
IMPORT AND EXPORT	Import Chem Data		✓
	Graph Publisher	✓	✓
	Import LSM	✓	✓
	Movie Creator	✓	✓
	HDF5 Browser	✓	✓
	Import Tektronix WFM Files	✓	✓
	Agilent MS Reader	✓	✓
	Send Graphs to Powerpoint	✓	✓
Send Graphs to Word	✓	✓	

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