SigmaXL Version 9.1

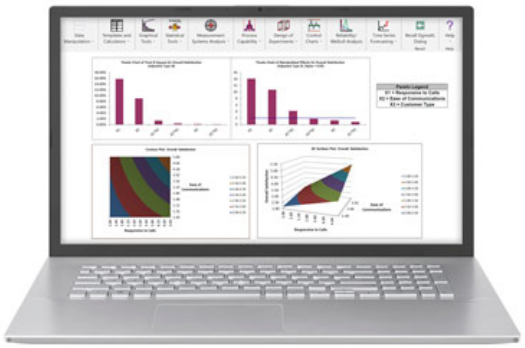
SigmaXL® Version 9.1 Feature List Summary (PDFs/Whats New in SigmaXL Version 9.1.pdf)

SigmaXL Version 9.1 Workbook (PDFs/SigmaXL Version 9.1 Workbook.pdf)

Compatible with Excel For Windows and Mac (https://www.sigmaxl.com/System_Requirements.shtml)

Menu Layout: Classical or DMAIC (https://www.sigmaxl.com/MenuOptions.shtml)

Recall Last Dialog (https://www.sigmaxl.com/RecallSigmaXL.shtml)



Data Manipulation: (https://www.sigmaxl.com/DataManipulation.shtml)

- Subset by Category (https://www.sigmaxl.com/DataManipulation.shtml#CatSubset), Number (https://www.sigmaxl.com/DataManipulation.shtml#NumericalSubset), Date (https://www.sigmaxl.com/DataManipulation.shtml#DateSubset) or Random (https://www.sigmaxl.com/DataManipulation.shtml#RandomSubset)
- Transpose Data (https://www.sigmaxl.com/TransposeStack.shtml)
- Stack Subgroups Across Rows (https://www.sigmaxl.com/TransposeStack.shtml#StackAcrossRows)
- Stack and Unstack Columns (https://www.sigmaxl.com/TransposeStack.shtml#StackColumns)
- Standardize Data (https://www.sigmaxl.com/StandardizeData.shtml)
- Convert to Discrete (https://www.sigmaxl.com/converttodiscrete.shtml)
- Random Number Generator (https://www.sigmaxl.com/RandomNumberGenerator.shtml)
  - Normal (https://www.sigmaxl.com/RandomNumberGenerator.shtml)
  - Uniform (Continuous & Integer) (https://www.sigmaxl.com/RandomNumberGenerator.shtml)
  - Lognormal (https://www.sigmaxl.com/RandomNumberGenerator.shtml)
  - Weibull (https://www.sigmaxl.com/RandomNumberGenerator.shtml)
  - Triangular (https://www.sigmaxl.com/RandomNumberGenerator.shtml)

- Data Preparation (https://www.sigmaxl.com/DataPreparation.shtml)
  - Remove Blank Rows and Columns (https://www.sigmaxl.com/DataPreparation.shtml#RemoveBlank)
  - Change Text Data Format to Numeric (https://www.sigmaxl.com/DataPreparation.shtml#Text2Numeric)
- Box-Cox Transformation (https://www.sigmaxl.com/ProcessCapabilityBoxCox.shtml)

Templates & Calculators: (https://www.sigmaxl.com/TemplatesAndCalculators.shtml)

- DMAIC & DFSS Templates (https://www.sigmaxl.com/DMAICtemplates.shtml)
  - Team/Project Charter
  - SIPOC Diagram
  - Flowchart Toolbar
  - Data Measurement Plan
  - Cause & Effect (Fishbone) Diagram and Quick Template
  - Cause & Effect (XY) Matrix with Pareto
  - Failure Mode & Effects Analysis (FMEA) with RPN Sort
  - Quality Function Deployment (QFD)
  - Pugh Concept Selection Matrix
  - Control Plan (https://www.sigmaxl.com/DMAICtemplates.shtml)
- Lean Templates
  - Takt Time Calculator (takttimecalc.shtml)
  - Value Analysis/Process Load Balance (value_analysis.shtml)
  - Value Stream Mapping (value_stream.shtml)
- Graphical Templates (https://www.sigmaxl.com/GraphicalTemplates.shtml)
  - Pareto Chart (https://www.sigmaxl.com/GraphicalTemplates.shtml#
  - Histogram (https://www.sigmaxl.com/GraphicalTemplates.shtml#
  - Run Chart (https://www.sigmaxl.com/GraphicalTemplates.shtml#
- Probability Distribution Calculators (https://www.sigmaxl.com/PDCalculators.shtml)
  - Normal, Lognormal, Exponential, Weibull
  - Binomial, Poisson, Hypergeometric (https://www.sigmaxl.com/PDCalculators.shtml)

- Statistical Templates (https://www.sigmaxl.com/StatisticalTemplates.shtml)
  - Sample Size - Discrete and Continuous (https://www.sigmaxl.com/StatisticalTemplates.shtml)
  - Minimum Sample Size for Robust t-Tests and ANOVA (https://www.sigmaxl.com/MinSampleSizeRobust.shtml)
  - 1 Sample t-Test and Confidence Interval for Mean (https://www.sigmaxl.com/1SampleT.shtml)
  - 1 Sample Z-Test and Confidence Interval for Mean (https://www.sigmaxl.com/1SampleZ.shtml)
  - 2 Sample t-Test and Confidence Interval (Compare 2 Means) (https://www.sigmaxl.com/2SampleT_new.shtml)
  - 1 Sample Equivalence Test For Mean (https://www.sigmaxl.com/1SampleEquivalence.shtml)
  - 2 Sample Equivalence Test (Compare 2 Means) (https://www.sigmaxl.com/2SampleEquivalence.shtml)
  - 1 Sample Chi-Square Test and CI for Standard Deviation (https://www.sigmaxl.com/1SampleChi.shtml)
  - 2 Sample F-Test and CI (Compare 2 Standard Deviations) (https://www.sigmaxl.com/2SampleF.shtml)
  - 1 Proportion Test and Confidence Interval (https://www.sigmaxl.com/1PropTest.shtml)
- Measurement System Analysis (MSA) Templates (https://www.sigmaxl.com/MSAtemplates.shtml)
  - Type 1 Gage Study (https://www.sigmaxl.com/Type1Gage.shtml)
  - Gage Bias and Linearity Study (https://www.sigmaxl.com/GageBias.shtml)
  - Gage R&R Study - with Multi-Vari Analysis (https://www.sigmaxl.com/MSAtemplates.shtml#Gag
  - Attribute Gage R&R (Attribute Agreement Analysis) (https://www.sigmaxl.com/MSAtemplates.shtml#Gag
- Process Sigma Level - Discrete and Continuous (https://www.sigmaxl.com/ProcessSigma.shtml)
- Process Capability & Confidence Intervals (https://www.sigmaxl.com/ProcCap.shtml)
- Tolerance Interval Calculator (Normal Exact) (https://www.sigmaxl.com/TolInterval.shtml)
- DOE Templates
  - 2 to 5 Factors
  - 2-Level Full and Fractional-Factorial designs
  - Main Effects & Interaction Plots
- Taguchi DOE Templates (https://www.sigmaxl.com/taguchiL8-3.shtml)
  - Taguchi L8 (2 Level) Three Factor - Robust Cake Example

- 2 Proportions Tests and Confidence Interval (https://www.sigmaxl.com/2PropTest.shtml)
- 2 Proportions Equivalence Test (https://www.sigmaxl.com/2PropEquivalenceTest.shtml)
- 1 Poisson Rate Test and Confidence Interval (https://www.sigmaxl.com/1PoissonRate.shtml)
- 2 Poisson Rates Test and Confidence Interval (https://www.sigmaxl.com/2PoissonRate.shtml)
- 2 Poisson Rates Equivalence Test (https://www.sigmaxl.com/2PoissonRates.shtml)
- One-Way Chi-Square and Goodness of Fit Test (With Exact and Monte Carlo P-Value) (https://www.sigmaxl.com/OneWayChi.shtml)
- One-Way Chi-Square and Goodness of Fit Test - Exact (https://www.sigmaxl.com/onewaychiexact.shtml)

(https://www.sigmaxl.com/taguchiL8-3.shtml)

(https://www.sigmaxl.com/taguchiL8-four.shtml)

- Taguchi L8 (2 Level) Four Factor - Catapult Example (https://www.sigmaxl.com/taguchiL8-four.shtml)

(https://www.sigmaxl.com/taguchiL9-4.shtml)

- Taguchi L9 (3 Level) Four Factor - Paper Airplane Example (https://www.sigmaxl.com/taguchiL9-4.shtml)
- L4, L8, L9, L12, L16, L18, L27
- Signal-to-Noise Ratios: Nominal is Best, Nominal is Best (Variance Only), Nominal is Best (Mean Square Deviation with Target), Larger is Better, Smaller is Better
- Pareto of Deltas (Effects) and ANOVA SS (Sum-of-Squares) % Contribution (for Main Effects and Two-Way Interactions)
- Main Effects and Interaction Plots

- Control Chart Templates (https://www.sigmaxl.com/ControlChartTemplates.shtml)

(https://www.sigmaxl.com/ControlChartTemplates.sht

- Individuals, (https://www.sigmaxl.com/ControlChartTemplates.sht
- C-Chart (https://www.sigmaxl.com/CControlChartTemplates.sh

Graphical Tools:

- Basic and Advanced (Multiple) Pareto Charts (https://www.sigmaxl.com/ParetoCharts.shtml)
- EZ-Pivot/Pivot Charts: Easily create Pivot Tables and Charts (https://www.sigmaxl.com/EZ-Pivot.shtml)
- Basic Histogram (https://www.sigmaxl.com/Histogram.shtml)
- Multiple Histograms and Descriptive Statistics (includes Confidence Interval for Mean and StDev., and Anderson-Darling Normality Test) (https://www.sigmaxl.com/Histograms.shtml)
- Multiple Histograms and Process Capability (Pp, Ppk, Cpm, ppm, %) (https://www.sigmaxl.com/HistProcessCapability.shtml)
- Multiple Boxplots (https://www.sigmaxl.com/BoxPlots.shtml), Multiple X Boxplots (https://www.sigmaxl.com/MultipleXBoxPlots.shtml), Dotplots (https://www.sigmaxl.com/DotPlots.shtml)
- Run Charts (with Nonparametric Runs Test allowing you to test for Clustering, Mixtures, Lack of Randomness, Trends and Oscillation) (https://www.sigmaxl.com/RunCharts.shtml)
- Overlay Run Chart (https://www.sigmaxl.com/OverlayRunChart.shtml)
- Multiple Normal Probability Plots (with 95% confidence intervals to ease interpretation of normality/non-normality)
- Analysis of Means (ANOM) Charts

(https://www.sigmaxl.com/ANOMOneWay.shtml)

- ANOM Normal One-Way (https://www.sigmaxl.com/ANOMOneWay.shtml)

(https://www.sigmaxl.com/ANOMTwoWay.shtml)

- ANOM Normal Two-Way (with Main Effects and Slice Charts) (https://www.sigmaxl.com/ANOMTwoWay.shtml)

(https://www.sigmaxl.com/ANOMBinomPropOneWay.s

- ANOM Binomial Proportions One-Way (https://www.sigmaxl.com/ANOMBinomPropOneWay.s

(https://www.sigmaxl.com/ANOMBinomPropTwoWay.s

- ANOM Binomial Proportions Two-Way (https://www.sigmaxl.com/ANOMBinomPropTwoWay.s

(https://www.sigmaxl.com/ANOMPoissonOne.shtml)

- ANOM Poisson Rate One-Way (https://www.sigmaxl.com/ANOMPoissonOne.shtml)

(https://www.sigmaxl.com/ANOMPoissonTwo.shtml)

- ANOM Poisson Rate Two-Way (https://www.sigmaxl.com/ANOMPoissonTwo.shtml)

(https://www.sigmaxl.com/ANOMNonparametricTR.sh

- Nonparametric Transformed Ranks (https://www.sigmaxl.com/ANOMNonparametricTR.sh

(https://www.sigmaxl.com/ANOMLVR.shtml)

- Variances & Levene Robust Variances (https://www.sigmaxl.com/ANOMLVR.shtml)

(https://www.sigmaxl.com/NormalProbabilityPlot.shtml)
- Multi-Vari Charts (https://www.sigmaxl.com/Multi-VariCharts.shtml)
- Scatter Plots (with linear regression and optional 95% confidence intervals and prediction intervals) (https://www.sigmaxl.com/ScatterPlots.shtml)
- Scatter Plot Matrix (https://www.sigmaxl.com/ScatterPlotMatrix.shtml)

Statistical Tools:

- P-Values turn red when results are significant (P-Value < alpha)
- Descriptive Statistics including Anderson-Darling Normality test, Skewness and Kurtosis with P-Values (https://www.sigmaxl.com/DescriptiveStats.shtml)
- Descriptive Statistics Options: (https://www.sigmaxl.com/DescriptiveStats.shtml)
  - Percentile Report and Percentile Ranges
  - Percentile Confidence and Tolerance Intervals
  - Additional Descriptive Statistics and Normality Tests (Shapiro-Wilk and Doomik-Hansen Normality)
  - Outlier (Boxplot and Grubbs) and Randomness (Nonparametric Runs) Tests
- 1 Sample t-test (https://www.sigmaxl.com/1-Sample_t_Test.shtml) and Confidence Intervals (https://www.sigmaxl.com/ConfidenceIntervals.shtml)
- Paired t-test (https://www.sigmaxl.com/PairedTTest.shtml), 2 Sample t-test (https://www.sigmaxl.com/TwoSampleT-Test.shtml)
- 2 Sample comparison tests: (https://www.sigmaxl.com/2%20Sample%20Comparison%
  - Reports AD Normality, F-test and Levene's for variance, t-test assuming equal and unequal variance, Mann-Whitney test for medians
  - Recommended tests are highlighted based on sample size, normality, and variance (https://www.sigmaxl.com/2%20Sample%20Compari

- One-Way ANOVA and Means Matrix (https://www.sigmaxl.com/OneWayAnova.shtml)
  - Multiple Comparison of Means Probability Methods (Post-Hoc): Fisher, Tukey, Dunnett With Control
- Automatic Assumptions Check for One Sample, Two-Sample, Paired T-tests and One-Way ANOVA (https://www.sigmaxl.com/OneWayAnova.shtml)
  - Test report with color highlight: Green (OK), Yellow (Warning) and Red (Serious Violation)
  - Test each sample for Normality. If not, check minimum sample size of robustness of test
  - Check each sample for Outliers: Potential (Tukey's Boxplot 1.5*IQR); Likely (2.2*IQR); Extreme (3*IQR)
  - Randomness (Nonparametric Runs Test)
  - Equal Variance (for 2 or more samples)
- Two-Way ANOVA (Balanced and Unbalanced) (https://www.sigmaxl.com/TwoWayAnova.shtml)
- Equal Variance Tests (Bartlett, Levene and Welch's ANOVA) (https://www.sigmaxl.com/EqualVarianceTests.shtml)
  - Multiple Comparison of Variances Probability Methods (Post-Hoc): F-Test (with Bonferroni Correction), Levene, Tukey ADM (Absolute Deviation for Medians)
  - Welch Multiple Comparison of Means Probability Methods (Post-Hoc): Welch Pairwise, Games Howell
- Correlation Matrix (Pearson and Spearman's Rank Correlation) (https://www.sigmaxl.com/CorrelationMatrix.shtml)
  - Automatic normality check for correlation utilizing the powerful Doornik-Hansen bivariate normality test
  - Yellow highlight to recommend significant Pearson or Spearman correlation - Pearson is highlighted if the data are bivariate normal, otherwise Spearman is highlighted

- Multiple Linear Regression: (https://www.sigmaxl.com/MultipleRegression.shtml)
  - Accepts continuous and/or categorical (discrete) predictors
  - Interactive Predicted Response Calculator with 95% Confidence Interval and 95%
- Advanced Multiple Regression: (https://www.sigmaxl.com/FitMultipleRegressionmodel.shtı
  - Standardization and coding of continuous predictors
  - Option to display regression equation with unstandardized coefficients

Prediction Interval
- Residual Plots: histogram, normal probability plot, residuals vs. time, residuals vs. predicted and residuals vs. X factors
- Residual types include Regular, Standardized, Studentized (Deleted t) and Cook's Distance (Influence), Leverage and DFITS
- Highlight of significant outliers in residuals
- Durbin-Watson Test for Autocorrelation in Residuals with p-value
- ANOVA report for categorical predictors
- Pure Error and Lack-of-Fit report
- Collinearity Variance Inflation Factor (VIF) and Tolerance report
- Fit Intercept is optional

(https://www.sigmaxl.com/MultipleRegression.shtml)
(https://www.sigmaxl.com/MultipleRegression.shtml)

- (1, 0) or (-1,0,+1) coding of categorical predictors
- Box-Cox Transformation
- Specify confidence level
- Residual Plots (Regular, Standardized, Studentized – Deleted t)
- Main Effects and Interaction Plots (Fitted Means)
- Contour and Surface Plots
- Optimization with optional constraints
- Automatic removal of extreme VIF or collinear terms (with alias and removal report)
- Specify interactions, quadratic and higher orders (all interactions or up to 3-Way)
- ANOVA Type I and/or Type III Sum-of-Squares with Pareto of Percent Contribution and Standardized Effects
- Lenth Pseudo Standard Error for Saturated Models (Orthogonal or Non-Orthogonal) with Monte Carlo or Student T P-Values
- Specify Test/Withhold Sample for R-square Test & StDev Test Validation
- R-Square Predicted (Leave-One-Out Cross Validation)
- R-Square K-Fold & StDev K-Fold (K-Fold Cross Validation)
- Test for Constant Variance: Breusch-Pagan. Anderson-Darling Normality test is applied to residuals in order to automatically select Normal or Koenker (Robust) version. Report includes the Overall test and Individual predictors as well.
- White robust standard errors for non-constant variance (Heteroskedasticity-Consistent)
- Durbin-Watson test for autocorrelation in residuals with P-Values
- Newey-West robust standard errors for non-constant variance with autocorrelation (Heteroskedasticity and Autocorrelation-Consistent)
- White or Newey-West automatically selected based on Durbin-Watson P-Values
- Stepwise/Best Subsets Regression:
  - Forward/Backward with alpha-to-enter, alpha-to-remove
  - Forward Selection with alpha-to-enter
  - Backward Elimination with alpha-to-remove
  - Forward, Backward Criterion: Minimize AICc, BIC; Maximize R-Square Adjusted, R-Square Predicted, R-Square K-Fold
  - Best Subsets utilizes the powerful MIDACO Solver (Mixed Integer Distributed Ant Colony Optimization) to solve best subsets with up to hundreds of continuous or categorical variables, including interactions and higher order terms. This feature gives SigmaXL a significant advantage over competitors with Best Subsets limited to 30 continuous variables.
  - Best Subsets Criterion: Minimize AICc, BIC;

Maximize R-Square Adjusted
- Hierarchical option
- Detailed report with additional statistics such as Condition Number and Mallows' Cp.

(https://www.sigmaxl.com/FitMultipleRegressionmode
(https://www.sigmaxl.com/FitMultipleRegressionmodel.shtı

- Multiple Response Optimization: (https://www.sigmaxl.com/MultipleResponseOptimization.shtml)
  (https://www.sigmaxl.com/MultipleResponseOptimization.shtml)
  - Multiple Response Optimization with Desirability
    - Multistart Nelder-Mead Simplex
    - MIDACO

    (https://www.sigmaxl.com/MultipleResponseOptimization.shtml)

- Binary and Ordinal Logistic Regression: (https://www.sigmaxl.com/LogisticRegression.shtml)
  (https://www.sigmaxl.com/LogisticRegression.shtml)
  - Powerful and user-friendly logistic regression.
  - Report includes a calculator to predict the response event probability for a given set of input X values
  - Categorical (discrete) predictors can be included in the model in addition to continuous predictors
  - Model summary and goodness of fit tests include Likelihood Ratio Chi-Square, Pseudo R-Square, Pearson Residuals Chi-Square, Deviance Residuals Chi-Square, Observed and Predicted Outcomes - Percent Correctly Predicted
  - Stored data includes Event Probabilities, Predicted Outcome, Observed-Predicted, Pearson Residuals, Standardized Pearson Residuals, and Deviance Residuals

  (https://www.sigmaxl.com/LogisticRegression.shtml)

- Chi-Square Test (Stacked Column data and Two-Way Table data) (https://www.sigmaxl.com/Chi-Square-Test.shtml)
  - With Fisher Exact (utilizing permutations and fast networks algorithms) and Monte Carlo P-Values
  - Options: Advanced Tests and Measures of Association for Nominal & Ordinal Categories
- Nonparametric Tests: (https://www.sigmaxl.com/NonparametricTests.shtml)
  - 1 Sample Sign and 1 Sample Wilcoxon (https://www.sigmaxl.com/OneSampleSignWilcoxon.shtml)
  - 2 Sample Mann-Whitney (https://www.sigmaxl.com/Mann-Whitney.shtml)
  - Kruskal-Wallis and Mood's Median Test (With graph of Group Medians and 95% Median Confidence Intervals) (https://www.sigmaxl.com/Kruskal-Wallis-Test.shtml)

    (https://www.sigmaxl.com/Kruskal-Wallis-Test.shtml)
  - Runs Test (https://www.sigmaxl.com/NPRunsTest.shtml)
  - With Exact and Monte Carlo P-Value
- Nonparametric Tests - Exact:
  - 1 Sample Wilcoxon - Exact (https://www.sigmaxl.com/OneSampleSignWilcoxonExact.shtml)
  - 2 Sample Mann-Whitney - Exact

- Power and Sample Size Calculators for:
  - 1 (https://www.sigmaxl.com/OneSampleT.shtml) and 2 Sample t-Test (https://www.sigmaxl.com/2SampleT.shtml)
  - One-Way ANOVA (https://www.sigmaxl.com/PSOneWayAnova.shtml)
  - 1 Proportion Test (https://www.sigmaxl.com/PSOneProportion.shtml), 2 Proportions Test (https://www.sigmaxl.com/PSTwoProportions.shtml)
  - The Power and Sample Size Calculators allow you to solve for Power (1 - Beta), Sample Size, or Difference (specify two, solve for the third)
- Power and Sample Size Chart. Quickly create a graph showing the relationship between Power, Sample Size and Difference

(https://www.sigmaxl.com/Mann-WhitneyExact.shtml)
- Kruskal-Wallis Median Test - Test (https://www.sigmaxl.com/Kruskal-Wallis-TestExact.shtml)
- Mood's Median Test - Test (https://www.sigmaxl.com/MoodsMedianExact.shtml)
- Runs Test - Exact (https://www.sigmaxl.com/RunsTestExact.shtml)

Measurement System Analysis:

- Create Gage R&R (Crossed) Worksheet: (https://www.sigmaxl.com/CreateAnalyzeGage.shtml)
  - Generate worksheet with user specified number of parts, operators, replicates

  (https://www.sigmaxl.com/CreateAnalyzeGage.shtml)
- Analyze Gage R&R (Crossed) (https://www.sigmaxl.com/CreateAnalyzeGage.shtml#AnalyzeGage)
  - ANOVA, %Total, %Tolerance (with upper and/or lower specifications), %Process, Variance Components, Number of Distinct Categories
  - Gage R&R Multi-Vari and X-bar R Charts
  - Confidence Intervals for %Total, %Tolerance, %Process and Standard Deviations
  - Handles unbalanced data

  (https://www.sigmaxl.com/CreateAnalyzeGage.shtml#AnalyzeGage)
- Attribute MSA (Binary, Ordinal, Nominal) (https://www.sigmaxl.com/AttributeMSABinary.shtml)
  - Attribute MSA (Binary) (https://www.sigmaxl.com/AttributeMSABinary.shtml)

    (https://www.sigmaxl.com/AttributeMSAOrdinal.shtml
  - Attribute MSA (Ordinal) (https://www.sigmaxl.com/AttributeMSAOrdinal.shtml

    (https://www.sigmaxl.com/AttributeMSANominal.shtm
  - Attribute MSA (Nominal) (https://www.sigmaxl.com/AttributeMSANominal.shtm

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Process Capability:

- Multiple Histograms and Process Capability (https://www.sigmaxl.com/HistProcessCapability.shtml)
- Capability Combination Report for Individuals/Subgroups: (https://www.sigmaxl.com/CCRIndividualsSubgroups.shtml)
  - Histogram, Normal Probability Plot and Normality Test
  - Capability Report (Cp, Cpk, Pp, Ppk, Cpm, ppm, %)
  - Control Charts

  (https://www.sigmaxl.com/CCRIndividualsSubgroups.shtml)
- Distribution Fitting Report (https://www.sigmaxl.com/CCR%20Individuals%20Nonnormal.shtml#Distribution_Fitting)
  - All valid distributions and transformations reported with histograms, curve fit and probability plots
  - Sorted by AD P-value

  (https://www.sigmaxl.com/CCR%20Individuals%20Nonnormal.shtml#Distribution_Fitting)
- Capability Combination Report for Nonnormal Data (Individuals) (https://www.sigmaxl.com/CCR%20Individuals%20Nonnor
  - Box-Cox Transformation (includes an automatic threshold option so that data with negative values can be transformed) (https://www.sigmaxl.com/ProcessCapabilityBoxCox.s
  - Johnson Transformation (https://www.sigmaxl.com/JohnsonTransformation.sht
  - Distributions supported: Half-Normal, Lognormal (2 & 3 parameter), Exponential (1 & 2), Weibull (2 & 3), Beta (2 & 4), Gamma (2 & 3), Logistic, Loglogistic (2 & 3), Largest Extreme Value, Smallest Extreme Value
  - Automatic Best Fit based on AD p-value
  - Nonnormal Process Capability indices: Z-Score (Cp, Cpk, Pp, Ppk) and Percentile (ISO) Method (Pp, Ppk)

Design of Experiments:

- Generate 2-Level Factorial and Plackett-Burman Screening Designs (https://www.sigmaxl.com/DOECatapult.shtml)
  - User-friendly dialog box
- Analyze 2-Level Factorial and Plackett-Burman Screening Designs (https://www.sigmaxl.com/DOECatapult.shtml)
  - Used in conjunction with Recall Last

    - 2 to 19 Factors; 4,8,12,16,20 Runs
    - Unique "view power analysis as you design"
    - Randomization, Replication, Blocking and Center Points

    (https://www.sigmaxl.com/DOECatapult.shtml)
- Basic DOE Templates (https://www.sigmaxl.com/BasicDOETemplates.shtml)
    - 2 to 5 Factors, 2-Level Full and Fractional-Factorial designs
    - Automatic update to Pareto of Coefficients
    - Easy to use, ideal for training

    (https://www.sigmaxl.com/BasicDOETemplates.shtml)
- Main Effects & Interaction Plots
- Contour & 3D Surface Plots
- Response Surface Designs (https://www.sigmaxl.com/DOECakeBake.shtml)
    - 2 to 5 Factors
    - Central Composite and Box-Behnken Designs
    - Easy to use design selection sorted by number of runs

    (https://www.sigmaxl.com/DOECakeBake.shtml)

Dialog, it is very easy to iteratively remove terms from the model
- Interactive Predicted Response Calculator with 95% Confidence Interval and 95% Prediction Interval.
- ANOVA report for Blocks, Pure Error, Lack-of-Fit and Curvature
- Collinearity Variance Inflation Factor (VIF) and Tolerance report
- Residual plots: histogram, normal probability plot, residuals vs. time, residuals vs. predicted and residuals vs. X factors
- Highlight of significant outliers in residuals
- Durbin-Watson Test for Autocorrelation

(https://www.sigmaxl.com/DOECatapult.shtml)

Control Charts:

- Control Chart Selection Tool (https://www.sigmaxl.com/ControlChartSelectionTool.shtml)
- Individuals (https://www.sigmaxl.com/IndividualsCharts.shtml), Individuals & Moving Range (https://www.sigmaxl.com/IndividualsMovingRangeCharts.shtml)
- X-Bar & R (https://www.sigmaxl.com/XBarR.shtml), X-Bar & S (https://www.sigmaxl.com/XBarS.shtml)
- I-MR-R (https://www.sigmaxl.com/I-MR-R.shtml), I-MR-S (Between/Within) (https://www.sigmaxl.com/I-MR-R.shtml)
- P (https://www.sigmaxl.com/PCharts.shtml), NP (https://www.sigmaxl.com/NPCharts.shtml), C (https://www.sigmaxl.com/CCharts.shtml), U (https://www.sigmaxl.com/UCharts.shtml)
- P (https://www.sigmaxl.com/Laney.shtml)' and U' (Laney) to handle overdispersion (https://www.sigmaxl.com/ULaney.shtml)
- Control charts include a report on tests for special causes. Special causes are also labeled on the control chart data point. Set defaults to apply any or all of Tests 1-8
- Process Capability report (Pp, Ppk, Cp, Cpk) is available for I, I-MR, X-Bar & R, X-bar & S charts
- Add data to existing charts for operator ease of use!
- Scroll through charts with user defined window size
- Advanced Control Limit options: Subgroup Start and End; Historical Groups (e.g. split control limits to demonstrate before and after improvement) (https://www.sigmaxl.com/AdvancedLimit.shtml)
- Exclude data points for control limit calculation
- Add comment to data point for assignable cause
- ± 1, 2 Sigma Zone Lines
- Control charts for Nonnormal data (Individuals)
    - Box-Cox (https://www.sigmaxl.com/ControlChartsBoxCox.shtm and Johnson Transformations
    - 16 Nonnormal distributions supported (see Process Capability)
    - Individuals chart of original data with percentile based control limits
    - Individuals/Moving Range chart for normalized data with optional tests for special causes

- Control Chart Templates: Rare Events**
- Control Chart Templates: Average Run Length

    - Rare Events T Chart (https://www.sigmaxl.com/RareEventsT.shtml)
      (https://www.sigmaxl.com/RareEventsT.shtml)
    - (https://www.sigmaxl.com/RareEventsT.shtml)Rare Events G Chart (https://www.sigmaxl.com/RareEventsg.shtml)
      (https://www.sigmaxl.com/RareEventsg.shtml)
    - (https://www.sigmaxl.com/RareEventsg.shtml)Rare Events Prob G Chart (https://www.sigmaxl.com/RareEventsProbG.shtml)
- Control Chart Templates: Time-Weighted**
    - Exponentially Weighted Moving Average (EWMA) Chart (https://www.sigmaxl.com/EWMA.shtml)
      (https://www.sigmaxl.com/EWMA.shtml)
    - (https://www.sigmaxl.com/EWMA.shtml)Tabular Cumulative Sum (CUSUM) Chart (https://www.sigmaxl.com/TabularCUSUM.shtml)
- Control Chart Templates: Trend**
    - Trend Chart (https://www.sigmaxl.com/Trend.shtml)

(ARL) Calculators**

- Average Run Length (ARL) (https://www.sigmaxl.com/ARLTables.shtml)
  (https://www.sigmaxl.com/ARLTables.shtml)
- (https://www.sigmaxl.com/ARLTables.shtml)Shewhart ARL (https://www.sigmaxl.com/Shewhart-ARL.shtml)
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- (https://www.sigmaxl.com/Shewhart-ARL.shtml)Attribute P ARL (https://www.sigmaxl.com/Attribute-P-ARL.shtml)
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- (https://www.sigmaxl.com/Attribute-P-ARL.shtml)Attribute C ARL (https://www.sigmaxl.com/Attribute-C-ARL.shtml)
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  (https://www.sigmaxl.com/EWMAMARL.shtml)
- (https://www.sigmaxl.com/EWMAMARL.shtml)CUSUM ARL (https://www.sigmaxl.com/CUSUMARL.shtml)

Reliability/Weibull Analysis:

- Weibull Analysis (https://www.sigmaxl.com/Weibull.shtml)
  (https://www.sigmaxl.com/Weibull.shtml)
    - Complete and Right Censored data
    - Least Squares and Maximum Likelihood
    - Output includes percentiles with confidence intervals, survival probabilities, and Weibull probability plot
      (https://www.sigmaxl.com/Weibull.shtml)

Time Series Forecasting and Control Charts for Autocorrelated Data**

- Autocorrelation (ACF/PACF) Plots (https://www.sigmaxl.com/Autocorrelation.shtml)
  (https://www.sigmaxl.com/Autocorrelation.shtml)
- (https://www.sigmaxl.com/Autocorrelation.shtml)Cross Correlation (CCF) Plots (https://www.sigmaxl.com/Crosscorrelation.shtml)
  (https://www.sigmaxl.com/Crosscorrelation.shtml)
- (https://www.sigmaxl.com/Crosscorrelation.shtml)Spectral Density Plot (https://www.sigmaxl.com/Spectral.shtml)
  (https://www.sigmaxl.com/Spectral.shtml)
- (https://www.sigmaxl.com/Spectral.shtml)Seasonal Trend Decomposition Plots (https://www.sigmaxl.com/Seasonal.shtml)
  (https://www.sigmaxl.com/Seasonal.shtml)
- (https://www.sigmaxl.com/Seasonal.shtml)Seasonal Interaction Plots (https://www.sigmaxl.com/SeasonalInteraction.shtml)

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- (https://www.sigmaxl.com/SeasonalInteraction.shtml)Exponential Smoothing Forecast (https://www.sigmaxl.com/ExpForecast.shtml)

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- (https://www.sigmaxl.com/ExpForecast.shtml)Exponential Smoothing – Multiple Seasonal Decomposition (MSD) Forecast (https://www.sigmaxl.com/ExpMSDForecast.shtml)

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- (https://www.sigmaxl.com/ExpMSDForecast.shtml)Exponential Smoothing Control Chart (https://www.sigmaxl.com/ExpControlChart.shtml)

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- (https://www.sigmaxl.com/ARIMAControlChart.shtml)ARIMA Control Chart with Predictors (https://www.sigmaxl.com/ARIMAForecastWithPredictors.shtml)

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- (https://www.sigmaxl.com/ARIMAForecastWithPredictors.shtml)ARIMA Multiple Seasonal Decomposition (MSD) Control Chart (https://www.sigmaxl.com/ARIMAMSDControlChart.shtml)

(https://www.sigmaxl.com/ARIMAMSDControlChart.shtml)
- (https://www.sigmaxl.com/ARIMAMSDControlChart.shtml)Utilities – Difference Data (https://www.sigmaxl.com/DifferenceData.shtml)

(https://www.sigmaxl.com/DifferenceData.shtml)
- (https://www.sigmaxl.com/DifferenceData.shtml)Utilities – Lag Data (https://www.sigmaxl.com/LagData.shtml)

(https://www.sigmaxl.com/LagData.shtml)
- (https://www.sigmaxl.com/LagData.shtml)Utilities – Interpolate Missing Values (https://www.sigmaxl.com/InterpolateMissingValues.shtml)

** New features in SigmaXL ® Version 9

Web Demos

Our CTO and Co-Founder, John Noguera, regularly hosts free Web Demos featuring SigmaXL and DiscoverSim

Click here to view some now!

(https://www.sigmaxl.com/Web_Demo.shtml)

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