** New features in SigmaXL® Version 6.0

### Excel 2007 Ribbon

**Menu Layout:** Classical or DMAIC

**Recall Last Dialog**

**Worksheet Manager**

**Data Manipulation:**
- Subset by Category, Number, Date or Random
- Stack Subgroups Across Rows
- Stack and Unstack Columns
- Standardize Data
- Random Number Generator
  - Normal
  - Uniform (Continuous & Integer)**
  - Lognormal**
  - Weibull**
  - Triangular**
- Box-Cox Transformation

**Templates & Calculators:**
- DMAIC & DFSS Templates
  - Team/Project Charter
  - SIPOC Diagram
  - Flowchart Toolbar
  - Data Measurement Plan
  - Cause & Effect (Fishbone) Diagram and Quick Template
  - Cause & Effect (XY) Matrix
  - Failure Mode & Effects Analysis (FMEA)
  - Quality Function Deployment (QFD)
  - Pugh Concept Selection Matrix
  - Control Plan
- Lean Templates
  - Takt Time Calculator
  - Value Analysis/Process Load Balance
  - Value Stream Mapping**
- Graphical Templates
  - Pareto Chart
  - Histogram
  - Run Chart
- Statistical Templates
  - Sample Size – Discrete and Continuous
  - 1 Sample 1 Confidence Interval for Mean**
  - 2 Sample T-Test (Assume Equal and Unequal Variances)**
  - 1 Sample Confidence Interval for Standard Deviation
  - 2 Sample F-Test (Compare 2 StDevs)**
  - 1 Proportion Confidence Interval (Normal and Exact)
  - 2 Proportions Test & Fisher’s Exact**
- Probability Distribution Calculators**
  - Normal, Lognormal, Exponential, Weibull
  - Binomial, Poisson, Hypergeometric
- MSA Templates
  - Gage R&R Study – with Multi-Vari Analysis
  - Attribute Gage R&R (Attribute Agreement Analysis)
- Process Sigma Level – Discrete and Continuous
- Process Capability & Confidence Intervals
- DOE Templates
  - 2 to 5 Factors
  - 2-Level Full and Fractional-Factorial designs
  - Main Effects & Interaction Plots
- Control Chart Templates
  - Individuals
  - C-Chart

### Graphical Tools:

- Basic and Advanced (Multiple) Pareto Charts
- EZ-Pivot/Pivot Charts: Easily create Pivot Tables and Charts
- Basic Histogram
- Multiple Histograms and Descriptive Statistics
  (includes Confidence Interval for Mean and StDev., and Anderson-Darling Normality Test)
- Multiple Histograms and Process Capability
  (Pp, Ppk, Cpm, ppm, %)
- Multiple Boxplots, Dotplots
- Run Charts (with Nonparametric Runs Test allowing you to test for Clustering, Mixtures, Lack of Randomness, Trends and Oscillation)
- Overlay Run Chart
- Multiple Normal Probability Plots (with 95% confidence intervals to ease interpretation of normality/non-normality)
- Multi-Vari Charts
- Scatter Plots (with linear regression and optional 95% confidence intervals and prediction intervals)
- Scatter Plot Matrix

### Measurement Systems Analysis:

- Create Gage R&R (Crossed) Worksheet:
  - Generate worksheet with user specified number of parts, operators, replicates
- Analyze Gage R&R (Crossed)
  - 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
- Attribute MSA (Binary)
  - Any number of samples, appraisers and replicates
  - Within Appraiser Agreement, Each Appraiser vs Standard Agreement, Each Appraiser vs Standard Disagreement, Between Appraiser Agreement, All Appraisers vs Standard Agreement; Fleiss’ kappa

### Process Capability:

- Multiple Histograms and Process Capability
- Capability Combination Report for Individuals/Subgroups:
  - Histogram, Normal Probability Plot and Normality Test
  - Capability Report (Cp, Cpk, Pp, Ppk, Cpm, ppm, %)
  - Control Charts
- Capability Combination Report for Nonnormal Data (Individuals)**
  - Box-Cox Transformation (includes an automatic threshold option so that data with negative values can be transformed)
  - Johnson Transformation
  - 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)
- Distribution Fitting Report**
  - All valid distributions and transformations reported with histograms, curve fit and probability plots
  - Sorted by AD p-value
### SigmaXL® Version 6.0 Feature List Summary

#### 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
- 1 Sample t-test and confidence intervals
- Paired t-test, 2 Sample t-test
- 2 Sample comparison tests:
  - 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
- One-Way ANOVA and Means Matrix
- Two-Way ANOVA (Balanced and Unbalanced)
- Equal Variance Tests (Bartlett, Levene and Welch’s ANOVA)
- Correlation Matrix (Pearson and Spearman’s Rank Correlation)
- Multiple Linear Regression:
  - Accepts continuous and/or categorical (discrete) predictors
  - Interactive Predicted Response Calculator with 95% Confidence Interval and 95% 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 1) 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

#### Design of Experiments:

- Generate 2-Level Factorial and Plackett-Burman Screening Designs
  - User-friendly dialog box
  - 2 to 19 Factors; 4,8,12,16,20 Runs
  - Unique “view power analysis as you design”
  - Randomization, Replication, Blocking and Center Points
- Basic DOE Templates
  - 2 to 5 Factors, 2-Level Full and Fractional-Factorial designs
  - Automatic update to Pareto of Coefficients
  - Easy to use, ideal for training
- Main Effects & Interaction Plots
- Analyze 2-Level Factorial and Plackett-Burman Screening Designs
  - Used in conjunction with Recall Last 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
- Contour & 3D Surface Plots**
- Response Surface Designs**
  - 2 to 5 Factors
  - Central Composite and Box-Behnken Designs
  - Easy to use design selection sorted by number of runs

#### Control Charts:

- Control Chart Selection Tool
- Individuals, Individuals & Moving Range
- X-Bar & R, X-Bar & S
- I-MR-R, I-MR-S (Between/Within)
- P, NP, C, U
- P‘ and U’ (Lane) to handle overdispersion
- 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.
- 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)
  - Exclude data points for control limit calculation**
  - Add comment to data point for assignable cause**
  - ± 2, Sigma Zone Lines**
- Control charts for Nonnormal data (Individuals)**
  - Box-Cox 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

#### Reliability/Weibull Analysis:

- Weibull Analysis
  - Complete and Right Censored data
  - Least Squares and Maximum Likelihood
  - Output includes percentiles with confidence intervals, survival probabilities, and Weibull probability plot.

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