

Solving Data Analysis Challenges Using MATLAB® and Statistics Products

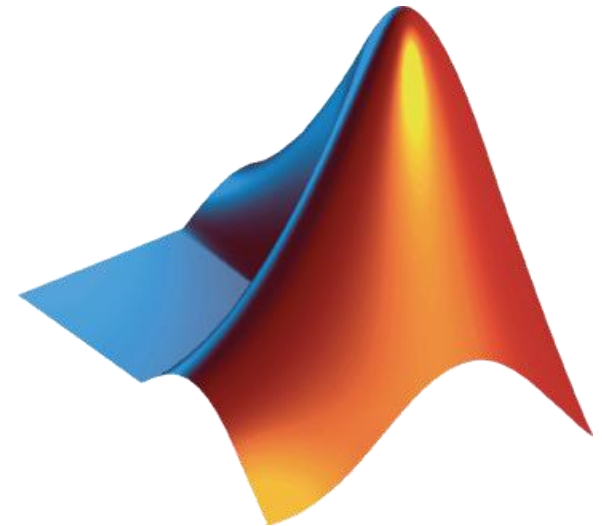
Isaac Noh
Application Engineer

MathWorks Symposium

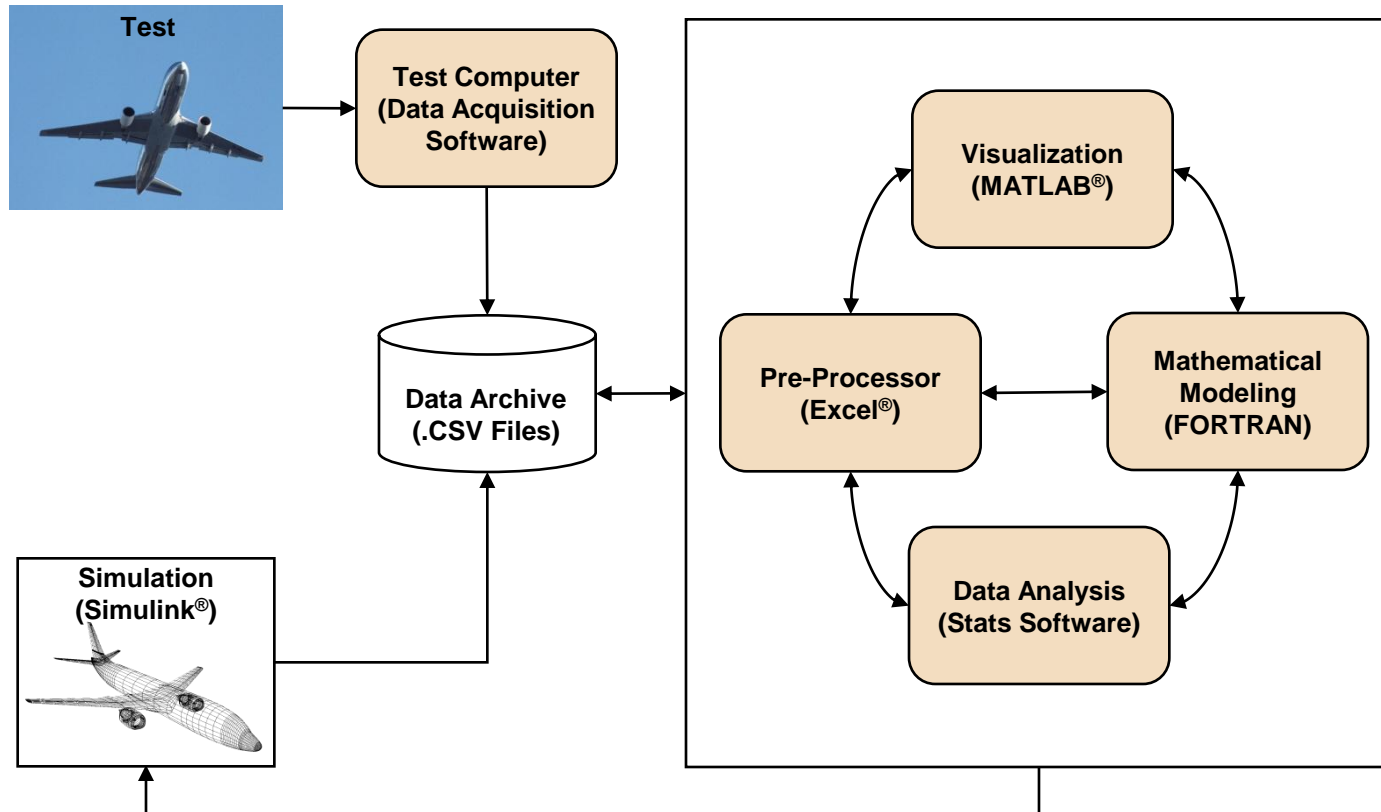
Adopting Model-Based Design
within Aerospace and Defense

Agenda

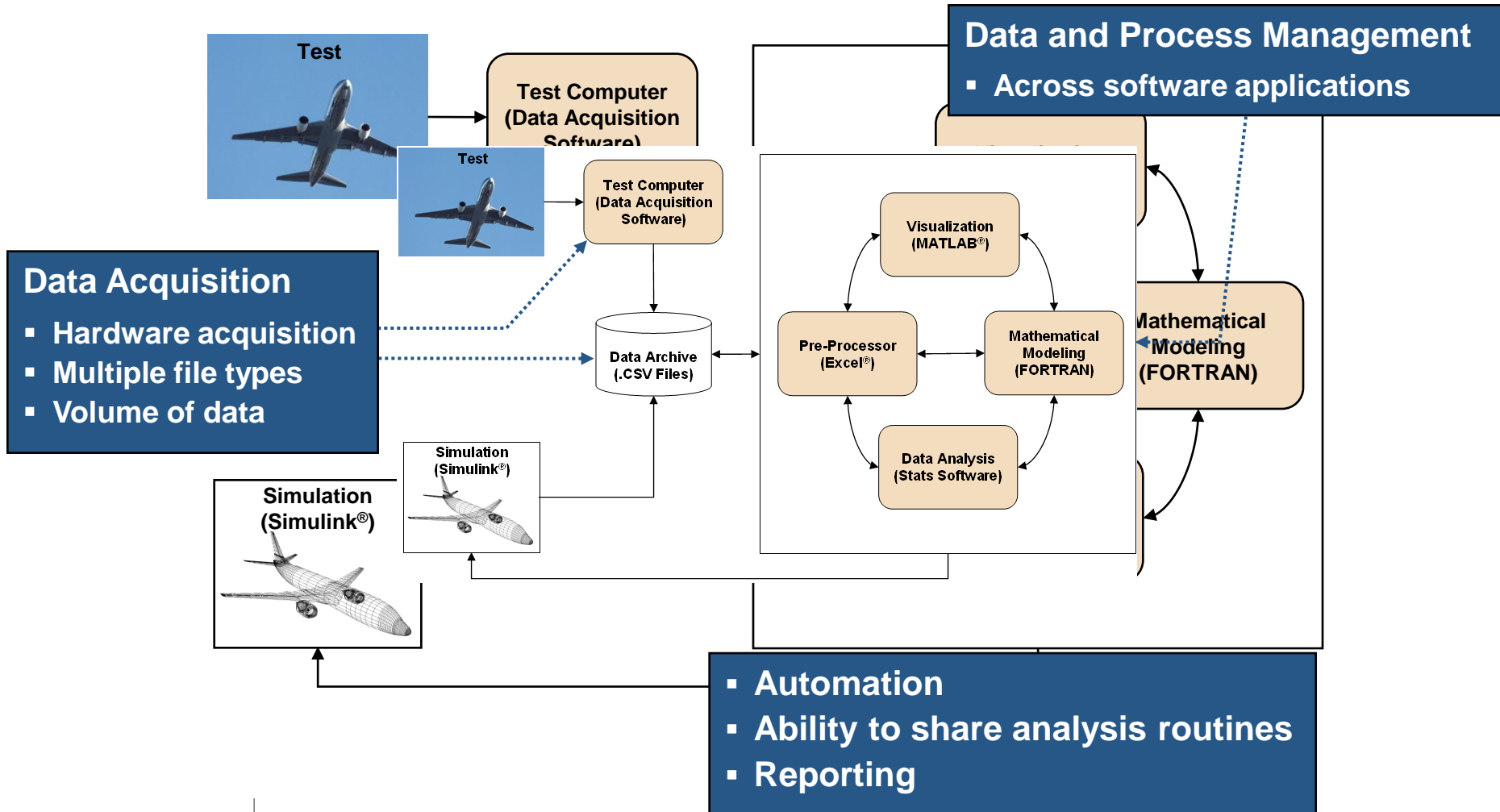
- Example data analysis workflow
- Demonstration: Analysis of aircraft wing stress
- Summary
- Question and answer



Example Data Analysis Workflow



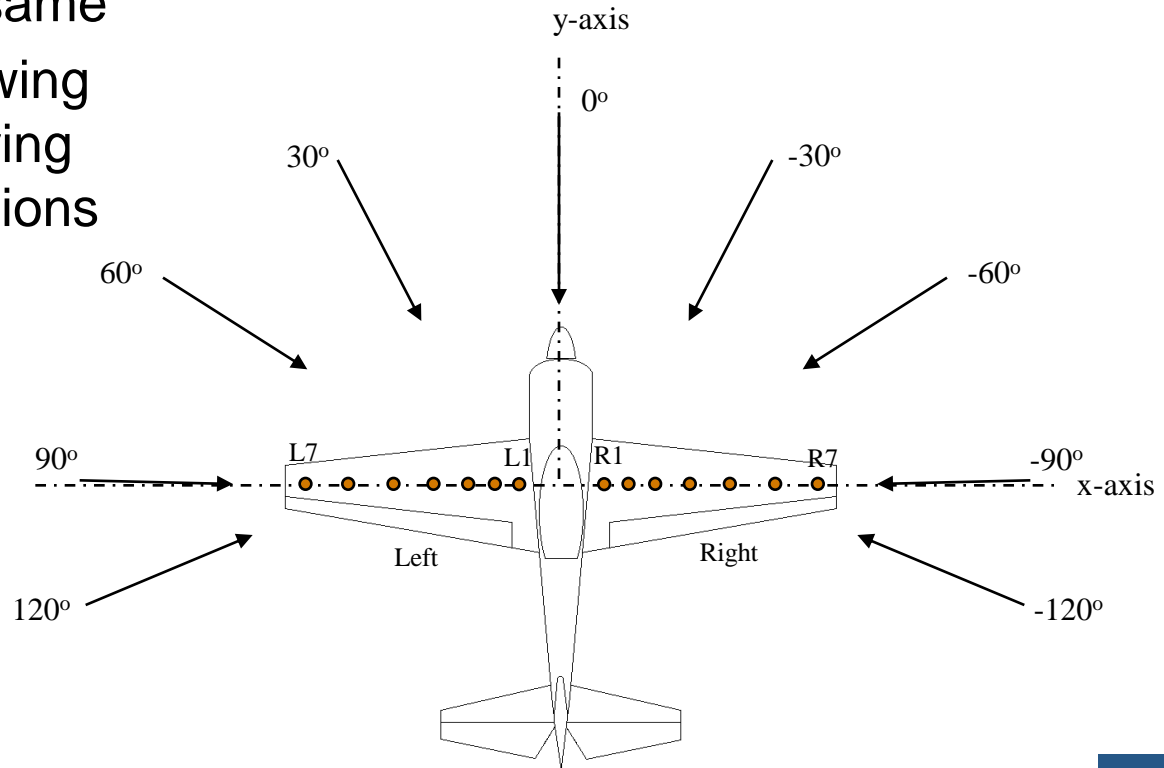
What are the challenges in this workflow?





Demonstration: Wing Stress Analysis

- Determine if:
 - Stress levels on left and right wings are the same
 - Shear force on the wing exceeds 160 kN during extreme wind conditions

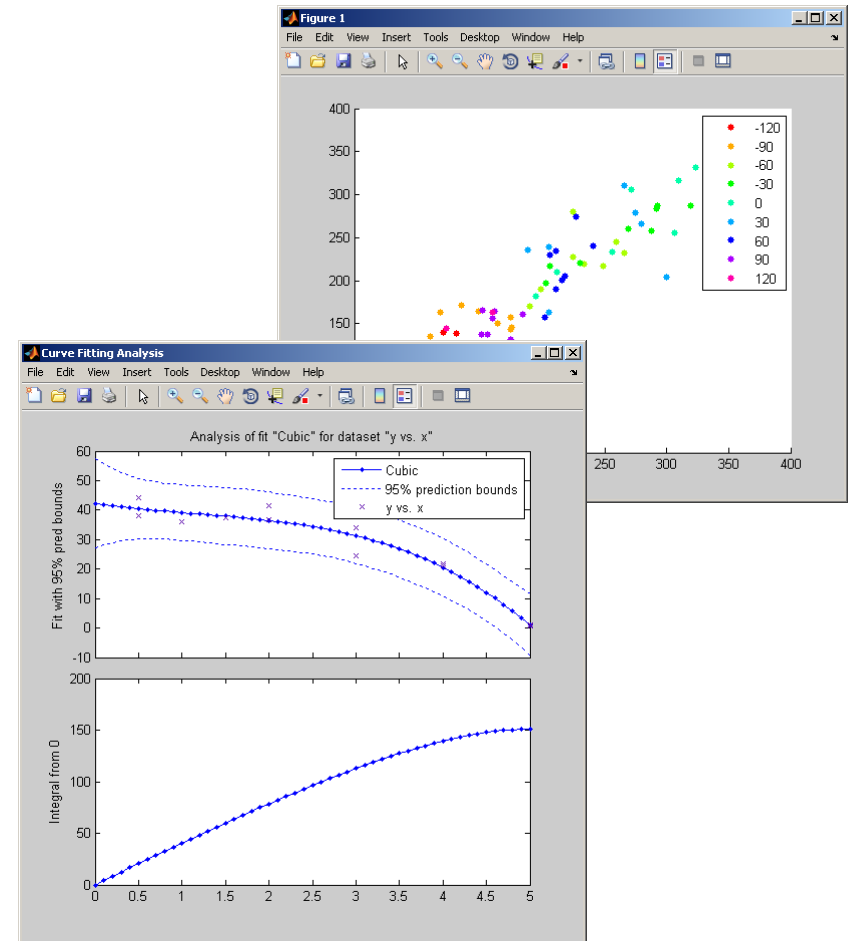


Summary: Wing Stress Analysis

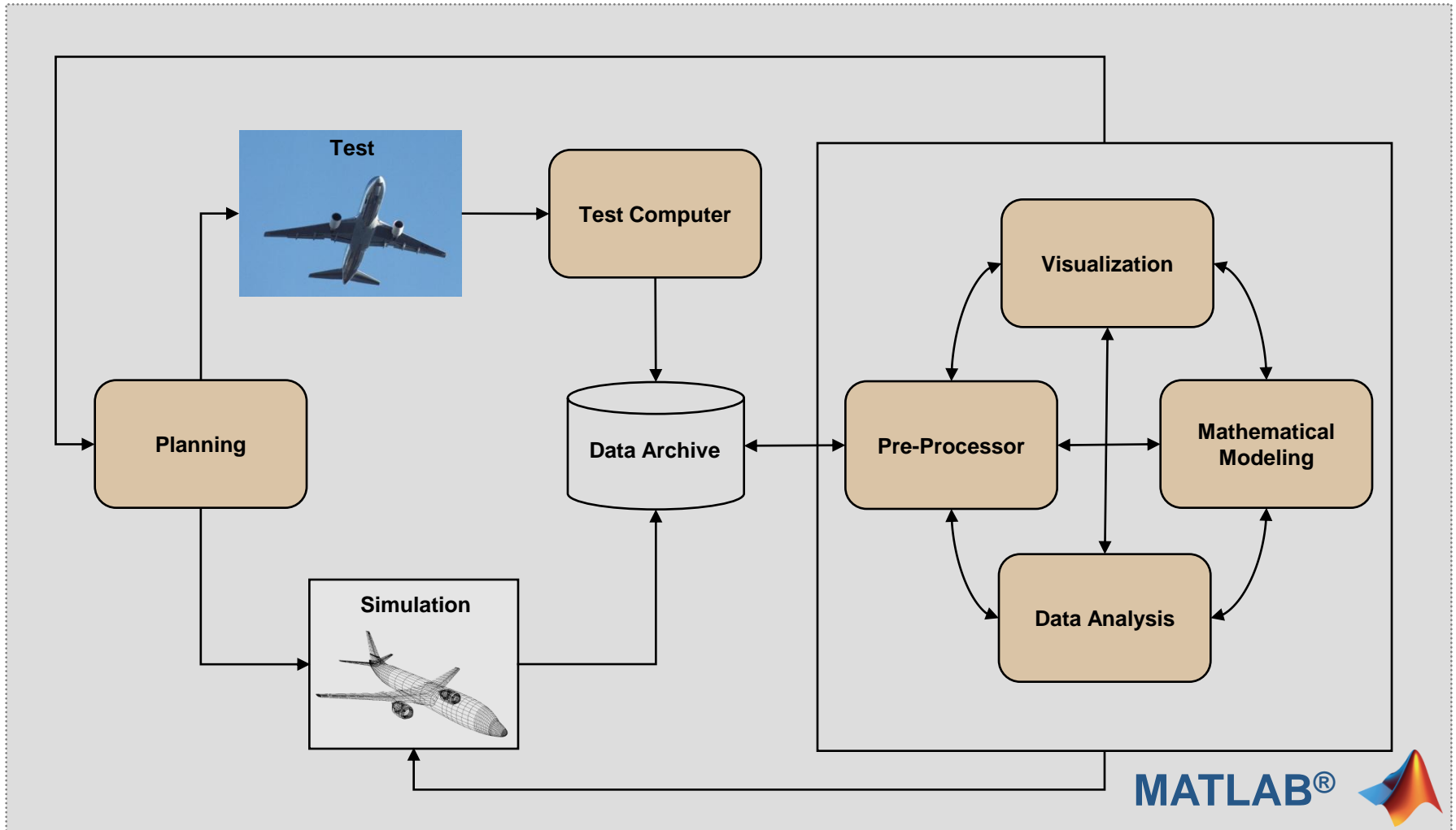
Products Used

- MATLAB®
- Curve Fitting Toolbox™
- Statistics Toolbox™

- Imported and visually inspected data
- Used statistics functionality to support the analysis
 - Hypothesis testing
 - Dataset and categorical arrays
 - Specialized visualizations and analysis techniques
- Used curve fitting analysis to estimate shear force



Summary



Questions?

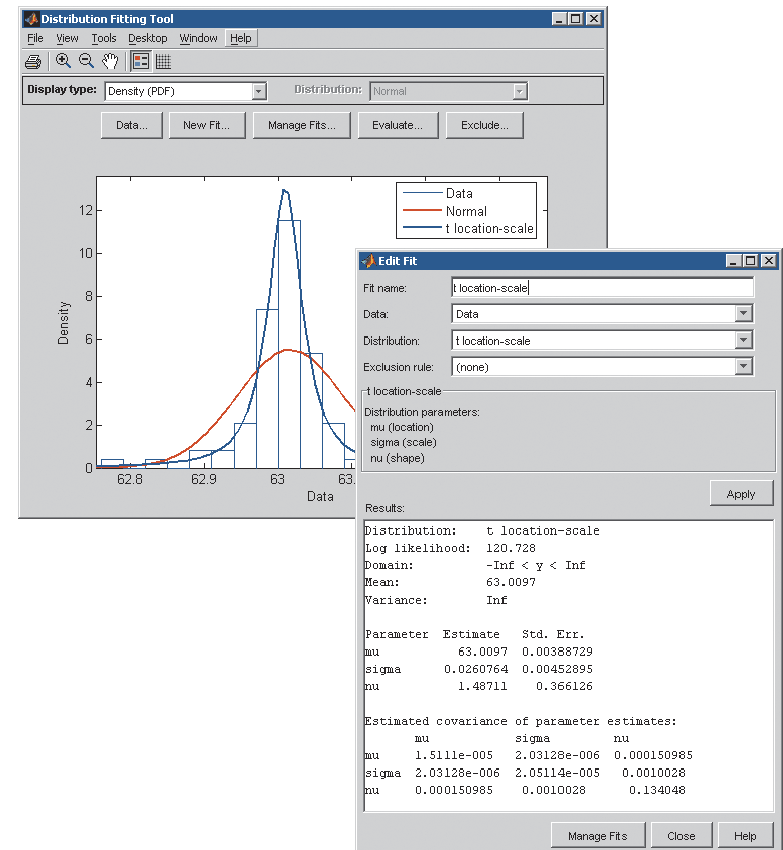
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Statistics Toolbox™

Statistics Toolbox™ provides interactive and command line tools for:

- Data collection and management
- Descriptive statistics
- Multivariate statistics
- Probability distribution fitting and modeling
- Hypothesis testing
- Analysis of variance/covariance
- Linear and nonlinear modeling
- Visualization
- Statistical Process Control



Curve Fitting Toolbox™

Graphical user interface and command line functions for:

- Previewing and preprocessing data
- Developing, comparing, and managing models
- Extensive library of linear, nonlinear, and nonparametric models
- Customizable model fitting
- Interpolation, extrapolation, differentiation, and integration

