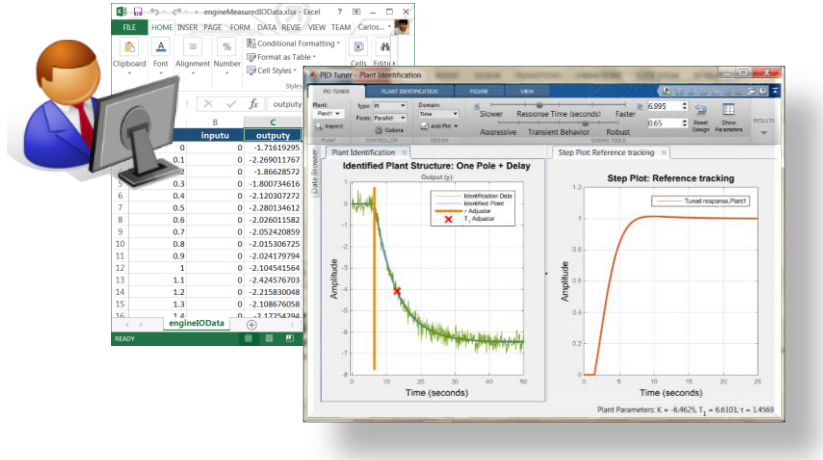
Extracting dynamic models from experimental or test data using *System Identification Toolbox*



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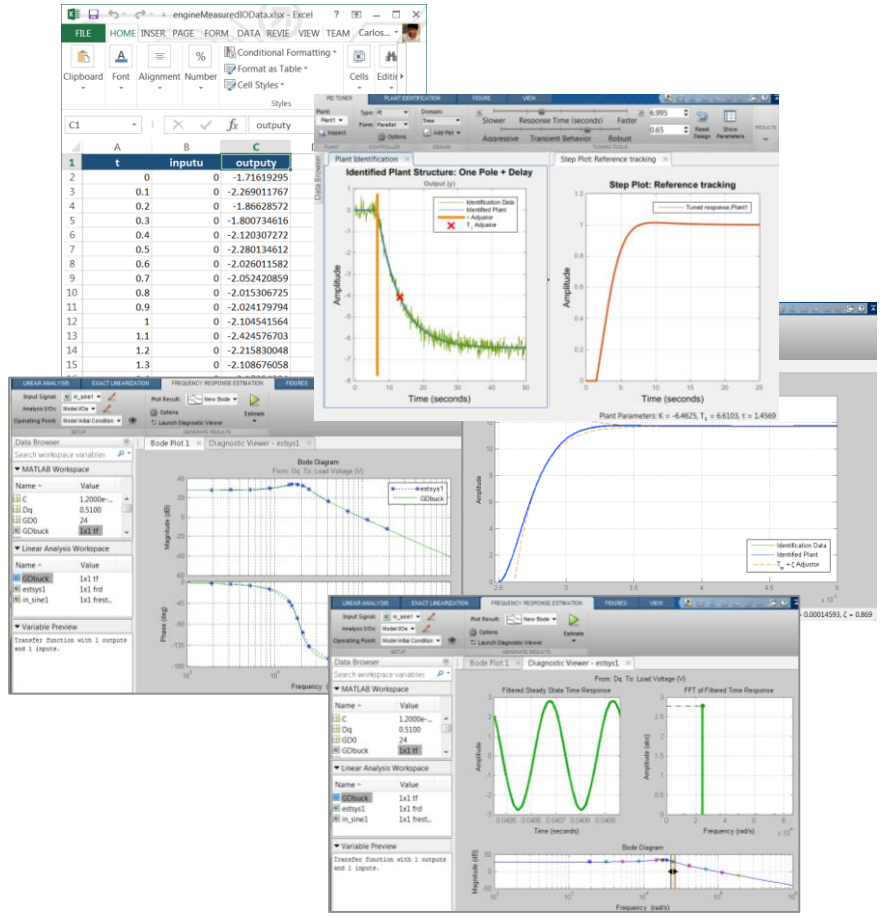
Key takeaways

- Advanced control design techniques rely heavily on the availability of good plant models
- System identification algorithms allow us to create very accurate dynamic plant models based on experimental or test data
- Interactive graphical interfaces provide quick access to powerful capabilities in the controls toolboxes without the need for scripting in MATLAB



Three application examples:

1. Generating dynamic plant models from experimental data

2. Extracting linear plant models from simulation test data

3. Using frequency response estimation to generate plant models

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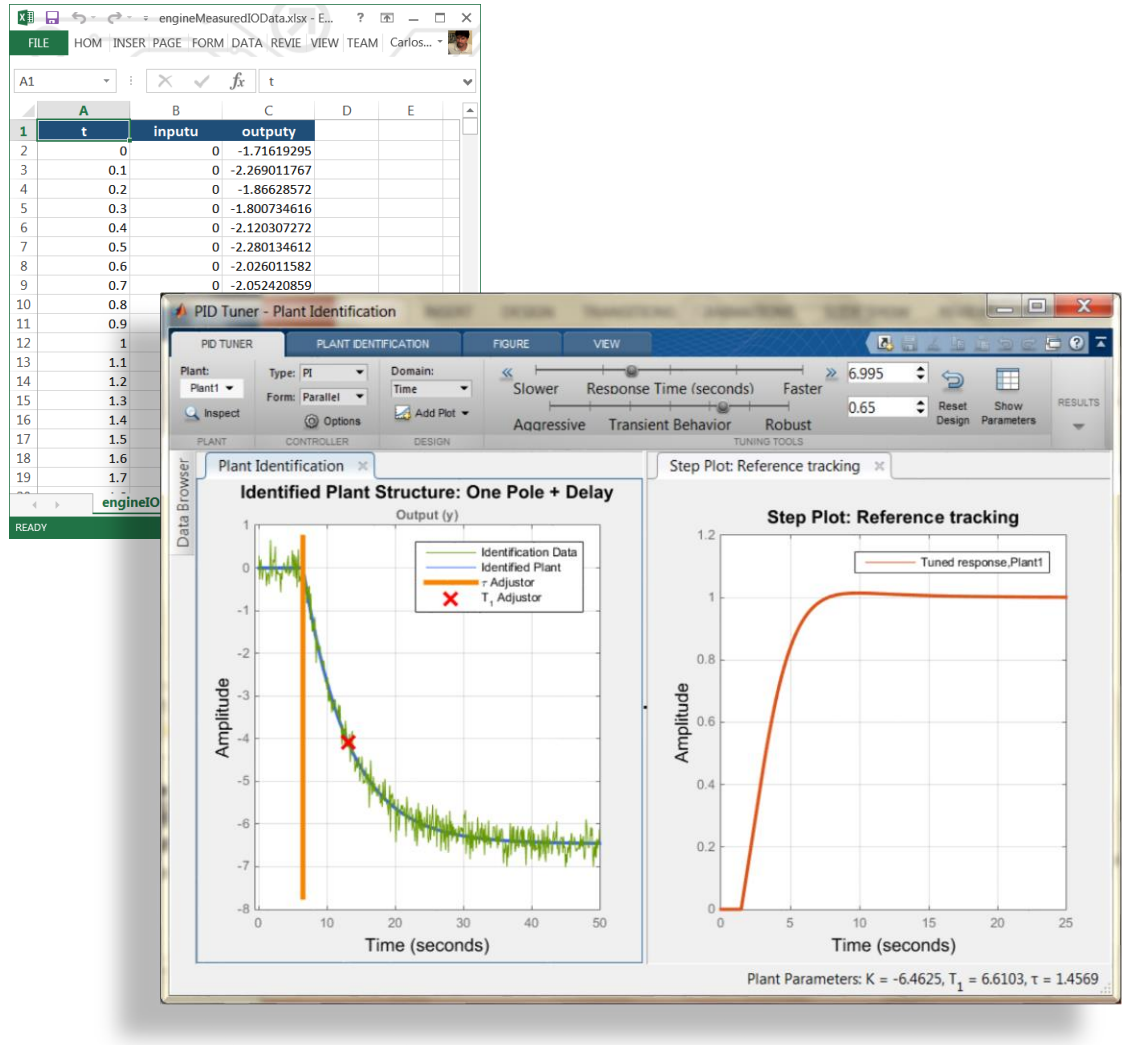
System Identification Integrated into PID Tuner App

Easy way to estimate a plant models and tune PID controller gains in one app

- Import measured input-output data directly into PID Tuner app
- Identify plant transfer function interactively or automatically
- Automatically tune PID controller gains



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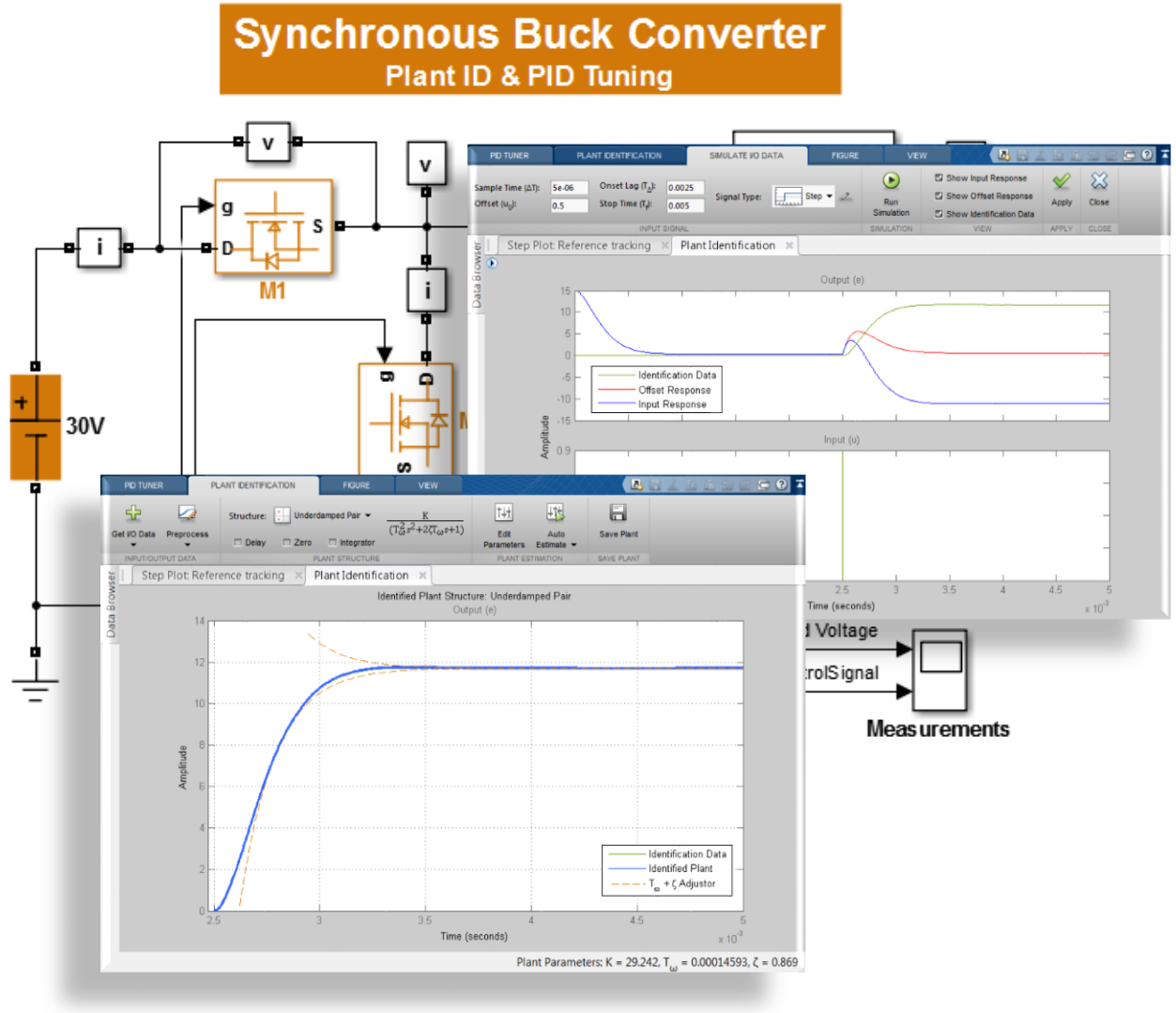
System Identification Integrated into PID Tuner in Simulink Control Design

Tune PID Controllers for Simulink models with discontinuities such as PWM and Stateflow logic

- Compute plant transfer function from simulation input-output data when exact linearization fails
- Inject a step or an impulse at the plant input
- Interactively or automatically fit the transfer function to simulation input-output data



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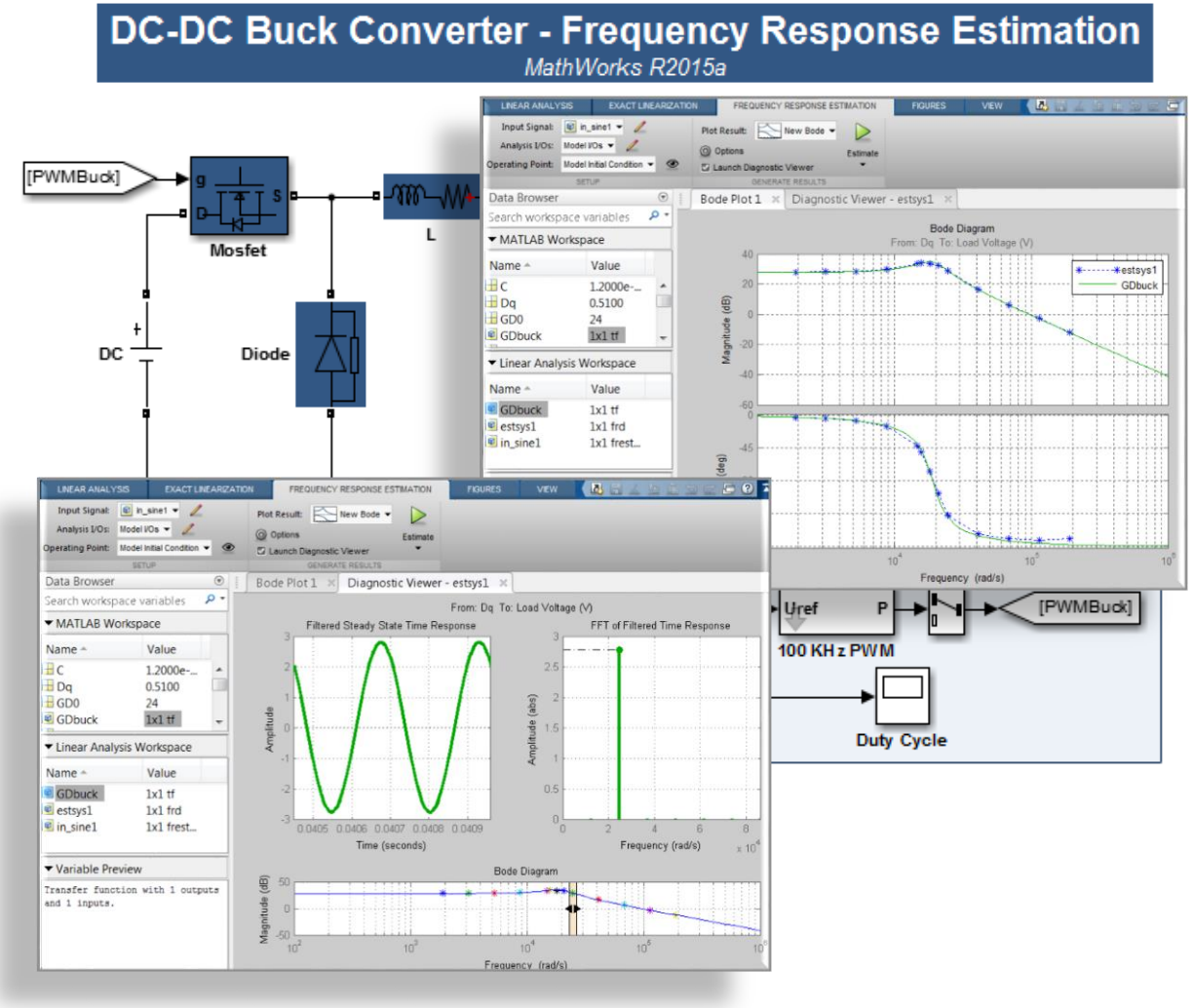
Frequency Response Estimation from Simulation Models

Automatic extraction of the frequency response of a system using the linear analysis tool

- Easy specification of input signal
- Optional initialization of input signal from the exact linearization results
- Plotting of frequency response together with exact linearization results



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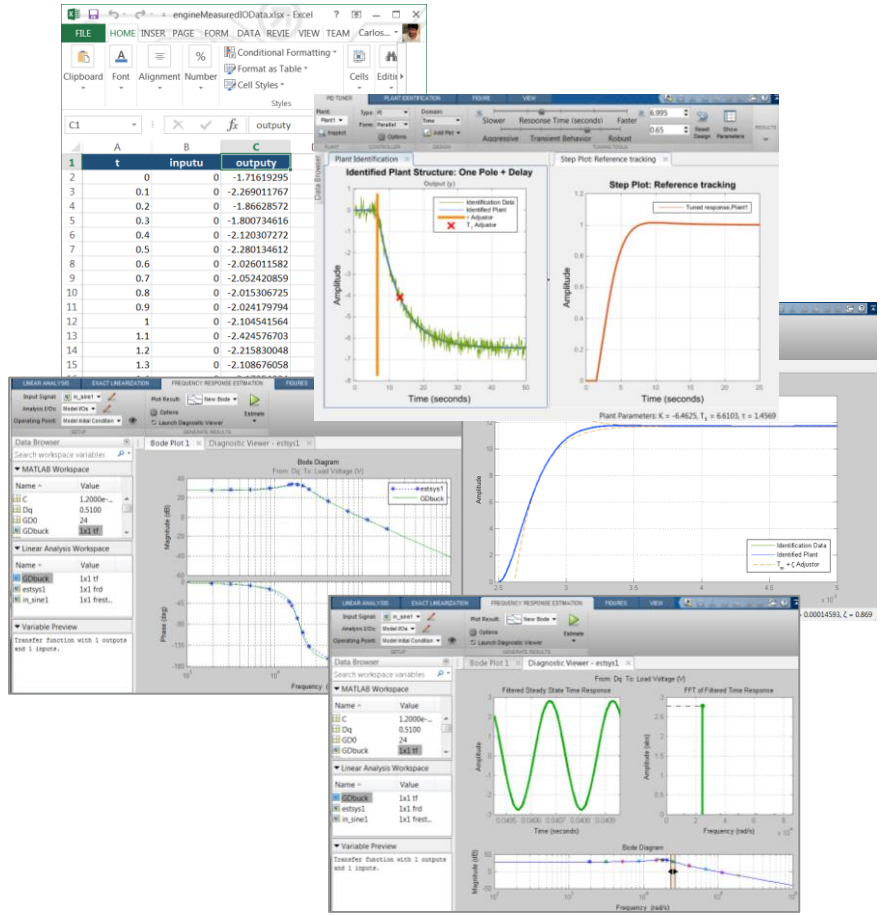
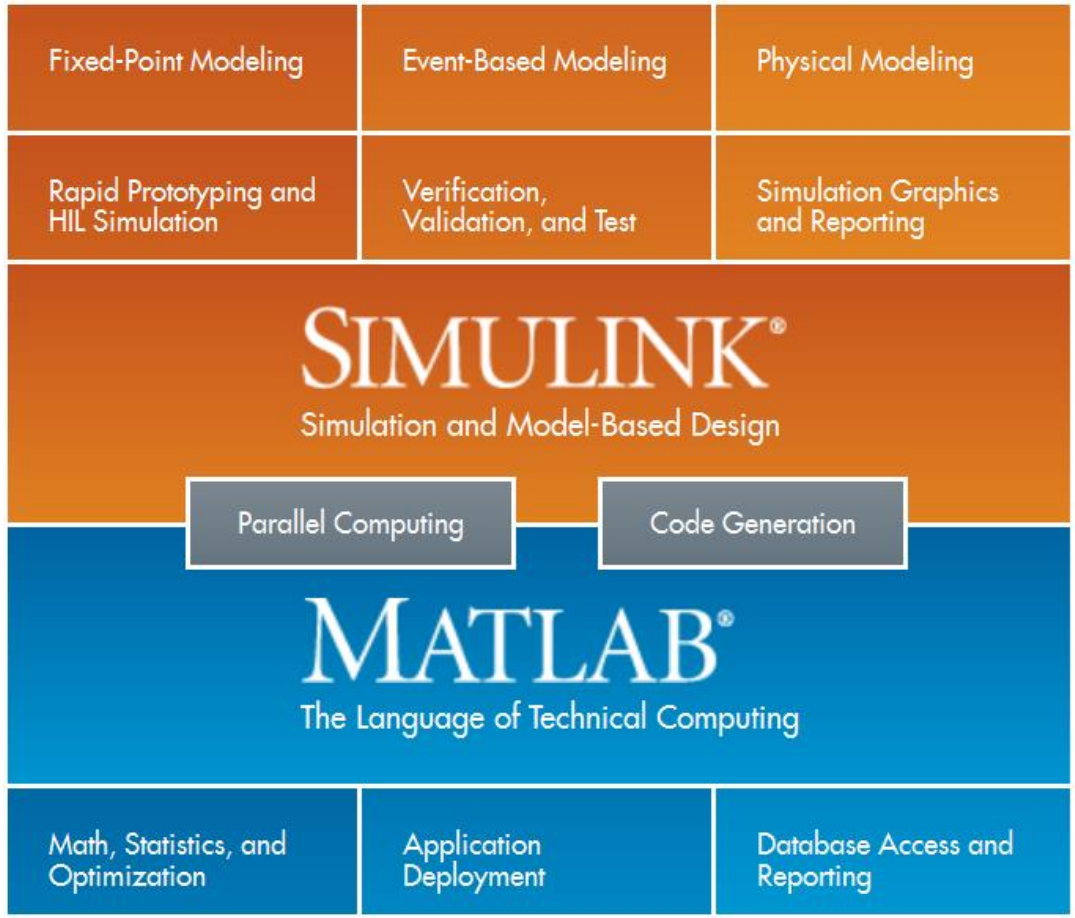


MathWorks Product Overview



Control System Toolbox
Fuzzy Logic Toolbox
Model Predictive Control Toolbox
Robust Control Toolbox
Simulink Control Design
Simulink Design Optimization
System Identification Toolbox

http://www.mathworks.com/solutions/control-systems/

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