

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





1. Generating dynamic plant models from experimental data

2. Extracting linear plant models from simulation test data



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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





1. Generating dynamic plant models from experimental data

2. Extracting linear plant models from simulation test data

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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 inputoutput data



Plant ID & PID Tuning



1. Generating dynamic plant models from experimental data

2. Extracting linear plant models from simulation test data



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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