Leveraging MATLAB in a Simulink-Based Design Environment

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Why use MATLAB?

- It allows you to do more than just launch Simulink!
- Some things are simply better done in MATLAB
- Use the best of both worlds to maximize productivity

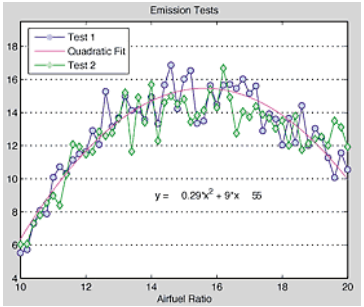
MATLAB Key Features

Their Use in Simulink

Data Import/Export

- Import/Export of Data with Standard File Formats
- Online Data Acquisition from standard I/Os and bus systems (ADCs, digital I/Os, OPC, CAN, RS232, TCP/IP, UDP, …)

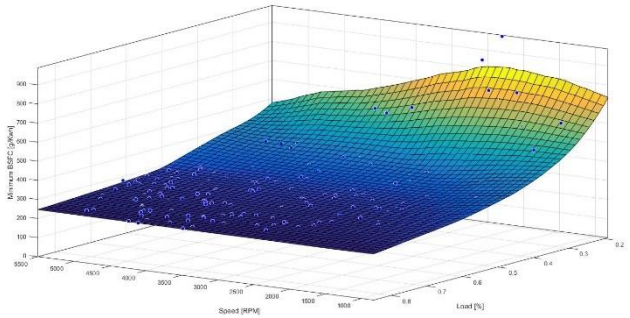
- Import of measured data for simulation



Data Analysis & Processing

- Powerful Mathematical Tools for Data Analysis (Statistics, Approximation, Optimization, Etc.)

- Data preprocessing before simulation
- Postprocessing of simulation results



MATLAB Key Features

Algorithm Development

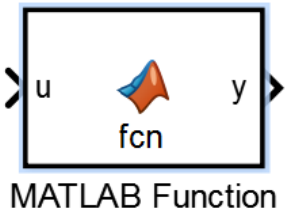
- Huge mathematical functions library
- System Objects
- Visualization Capabilities

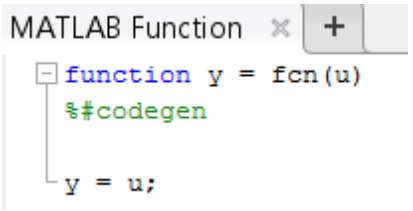
Workflow Automation

- Comprehensive programming language

Their Use in Simulink

- Integrate MATLAB based simulation models into Simulink





- Callbacks
- Parameter sweeps
- Etc.

Summary

- Imported real-world data from Excel for use in simulation
  - **`xlsread, signalbuilder`**
- Used Parallel Computing toolbox to speed up simulations
  - **`parpool, parfor`**
- Performed pre- and post-processing of data
- Automated the workflow by compiling everything in a script with loops

Thank You!