

Simulink - A Flexible Modelling and Simulation Environment

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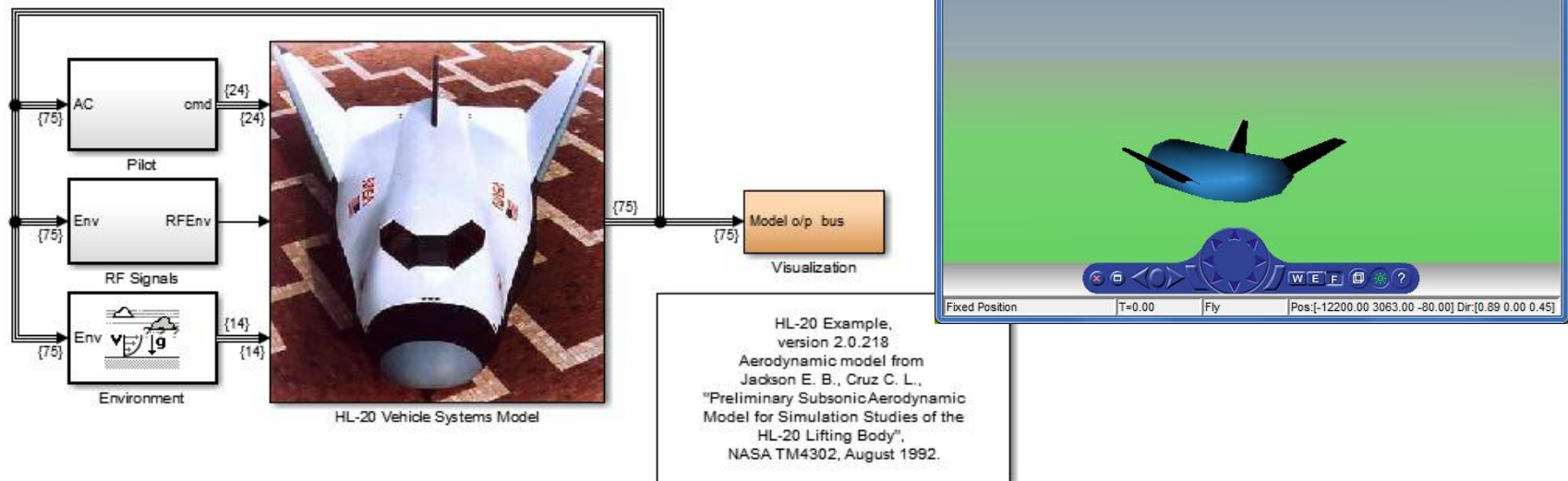
Benefits of Modelling and Simulation

- Explore what-if scenarios that are impractical to perform in real life
 - Too dangerous
 - Too expensive to perform the test
 - Not physically possible

- Gain a better understanding of the system to then improve its performance
 - Optimise system parameters
 - Reduce cost/Increase profitability
 - Reduce risk

Example: Testing a Fault Management System

- Inject failures into hydraulic sensors
- Observe the effects



Key Benefits of Simulink

- Simulink is a **visual development environment**
 - Simulate and interact with your model
 - Communicates the architecture of your model
 - Easy to maintain and update
- **One flexible environment** that caters to many different applications and domains, e.g.
 - Static, dynamic and discrete event systems
 - Controls, signal processing, physical modelling
 - System level modelling

Key Benefits of Simulink

- Simulink is **integrated with MATLAB**. This allows you to leverage the power of MATLAB to
 - Drive simulations using MATLAB scripts
 - Parameter sweeps and sensitivity analysis
 - Pre and post process data
 - Access toolbox functionality
 - Statistics and optimisation
 - Parallel computing

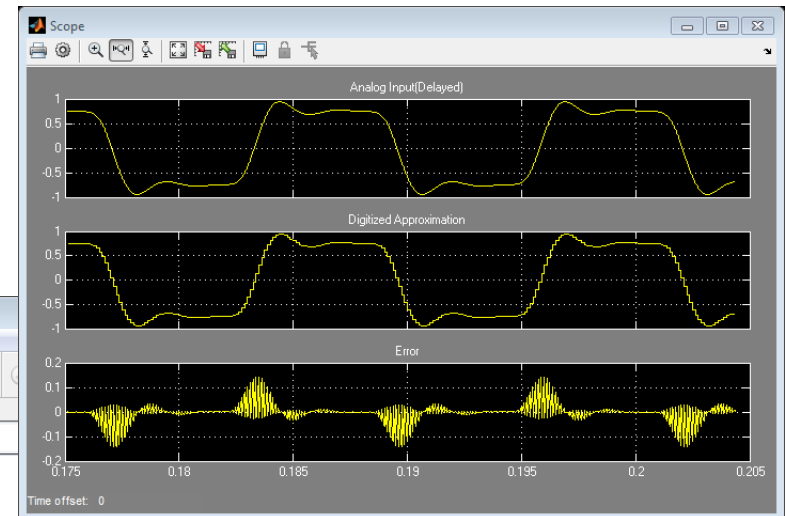
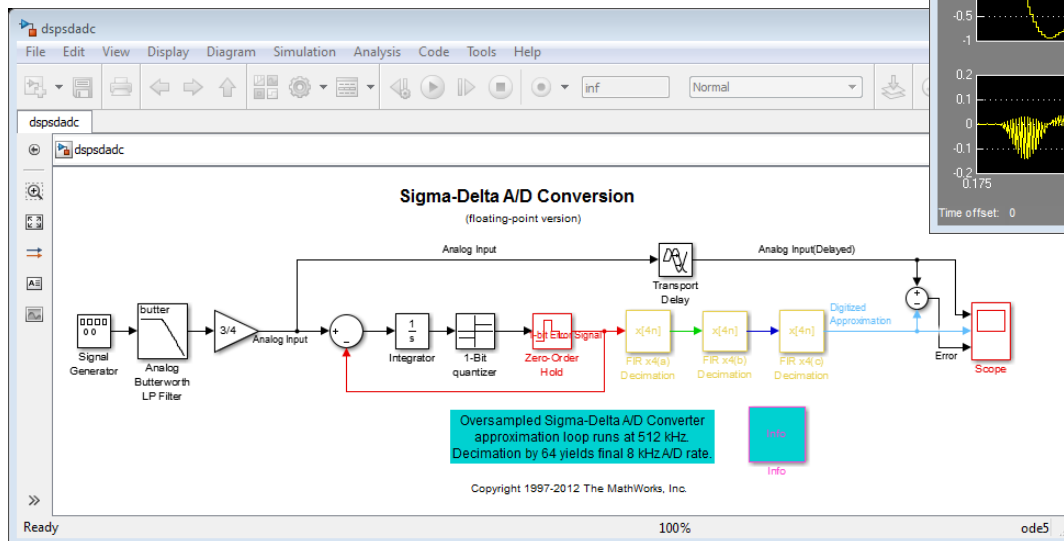
Simulink Modelling Capabilities

- Static/Dynamic Systems
- Event Based Modelling
- Signal Processing and Communications
- Control Design and Physical Modelling

Simulink Modelling Capabilities

Static/Dynamic Systems

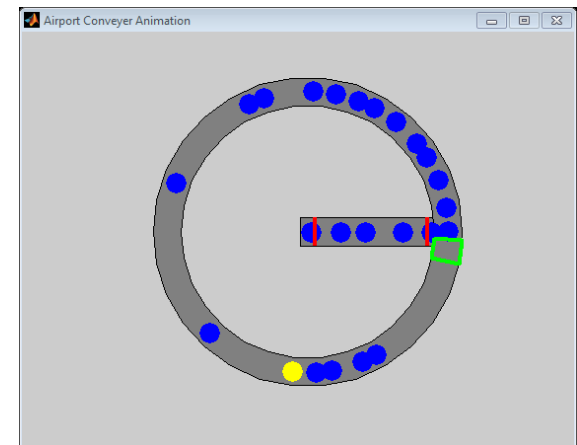
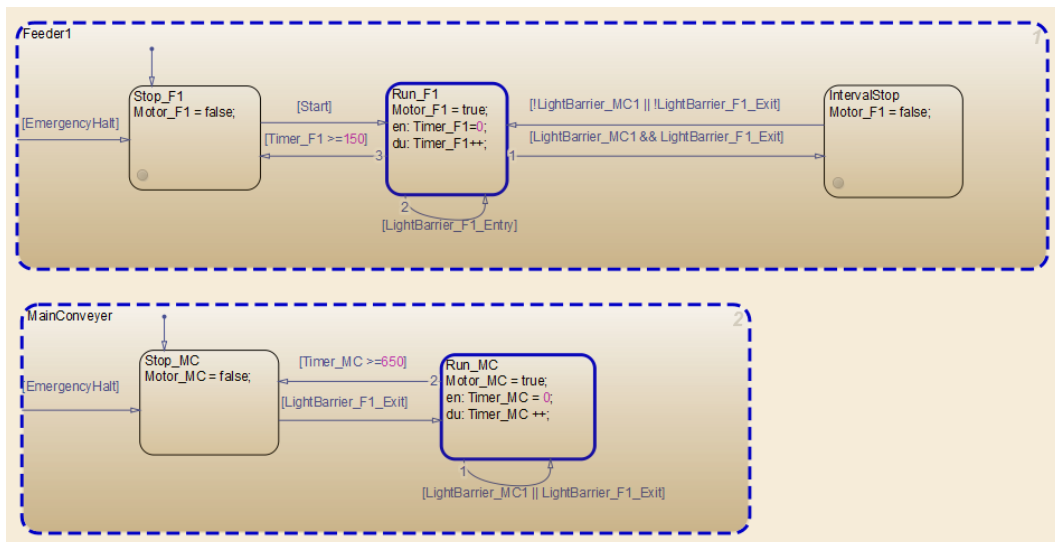
- Provides fixed step and variable step ODE solvers
- Allows you to model
 - Continuous time (analog)
 - Discrete time (digital)
 - Hybrid (mixed signal)
 - Multi-rate



Simulink Modelling Capabilities

Event Based Modelling

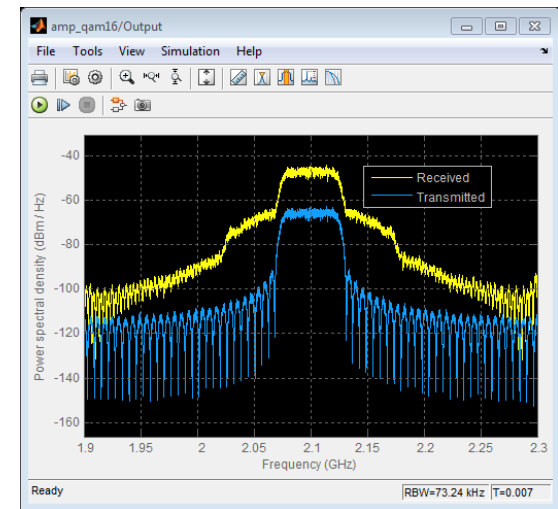
- Complex logic
 - State machines and flow charts
 - Graphical and tabular representations
- Discrete event systems
 - An event calendar manages asynchronous events
 - Non-deterministic systems, e.g. supply chain, network traffic, etc.



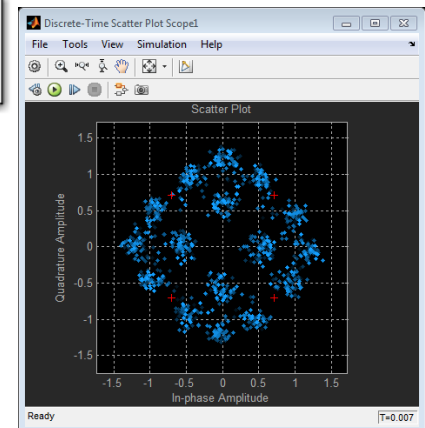
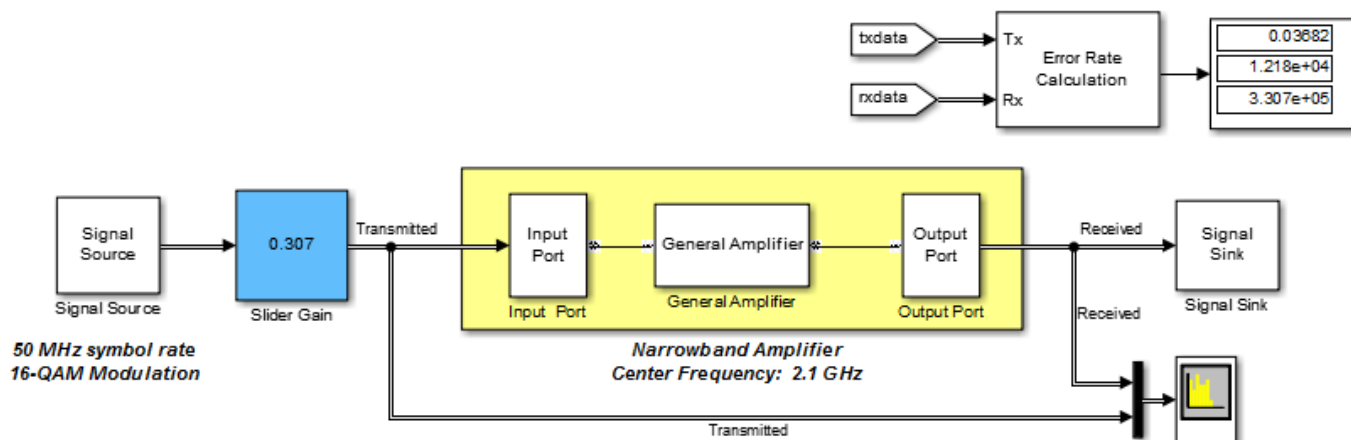
Simulink Modelling Capabilities

Signal Processing and Communications

- Design and analyse
 - DSP systems
 - Communications Systems
 - RF Systems



16-QAM Modulation with Nonlinear Amplifier



Simulink Modelling Capabilities

Control Design and Physical Modelling

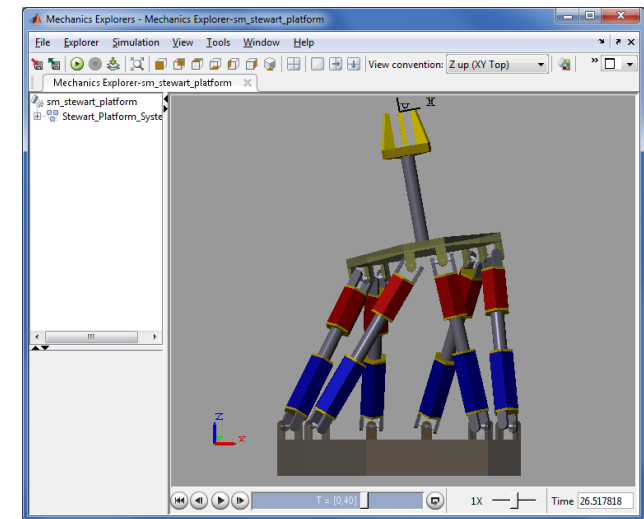
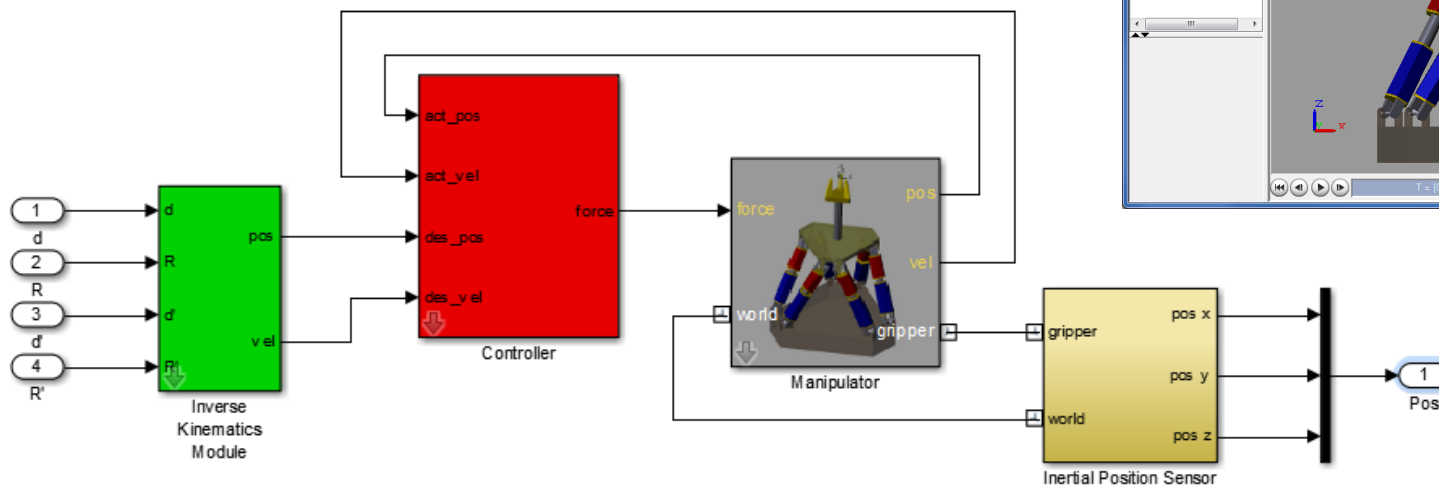
- Design and analyse plants and control systems
 - Automatic tuning of PID controller blocks
 - Linearize models
 - Numerically optimise model parameters based on measured data or constraints

- Physical modelling building blocks for
 - Mechanics
 - Electronics and Power systems
 - Hydraulics
 - and physical domains

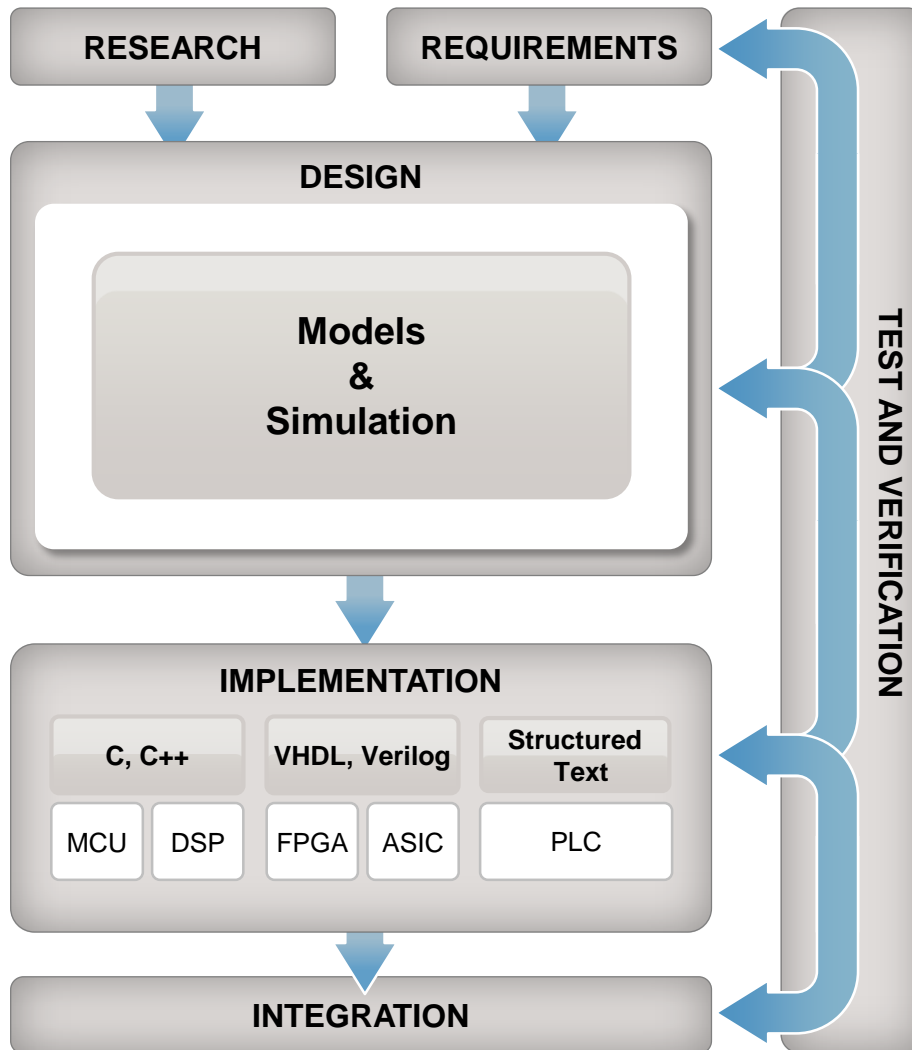
Simulink Modelling Capabilities

Control Design and Physical Modelling

- Combine control design and physical modelling to develop system level controller-plant simulations.



Beyond Modelling and Simulation



- System level models and simulation
- Requirements linking/tracing
- Model coverage
- Verify design objectives
- Automatic code generation
 - C, HDL, Structured Text
- Processor in the loop verification
- Real time simulation and testing

Model-Based Design

Summary

- Visual development environment that **both simulates and communicates** the architecture of your model, and also allows for **easy interaction** from the user.
- Simulink provides **one flexible simulation environment** that caters to many applications and domains.
 - Time and event driven simulations
 - Signal Processing, controls and physical modelling
- Simulink can **leverage the power of MATLAB**
 - E.g. MATLAB scripting and access to toolbox functionality

Further Information

<http://www.mathworks.com.au/products/simulink/>

SIMULINK
Simulation and Model-Based Design

Overview | Features | Model Examples | Videos | Webinars | New Features | Product Trial

Simulink Overview
Get an overview of Simulink modeling and simulation capabilities.

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MATLAB Student

Product Resources
Documentation
Hardware Support
Technical Articles
System Requirements

Simulink® is a block diagram environment for multidomain simulation and Model-Based Design. It supports simulation, automatic code generation, and continuous test and verification of embedded systems.

Simulink provides a graphical editor, customizable block libraries, and solvers for modeling and simulating dynamic systems. It is integrated with MATLAB®, enabling you to incorporate MATLAB algorithms into models and export simulation results to MATLAB for further analysis.

Request a Trial

Training courses - Sydney

Course Name	Course Code	Start Date	End Date	City
MATLAB Fundamentals	MLBE	5-Aug-14	7-Aug-14	Sydney
Stateflow for Logic Driven System Modeling	SLSF	14-Aug-14	15-Aug-14	Sydney
Embedded Coder for Production Code Generation	SLEC	16-Sep-14	18-Sep-14	Sydney
MATLAB Fundamentals	MLBE	30-Sep-14	2-Oct-14	Sydney
MATLAB Programming Techniques	MLPR	14-Oct-14	15-Oct-14	Sydney
Physical Modeling of Multidomain Systems with Simscape	SLPM-S	16-Oct-14	16-Oct-14	Sydney
Statistical Methods in MATLAB	MLST	11-Nov-14	12-Nov-14	Sydney
Image Processing with MATLAB	MLIP	13-Nov-14	14-Nov-14	Sydney

Course Name	Course Code	Start Date	End Date	City
MATLAB Programming Techniques	MLPR	12-Aug-14	13-Aug-14	e-learning
MATLAB Fundamentals	MLBE	2-Sep-14	4-Sep-14	e-learning
Simulink for System and Algorithm Modeling	SLBE	11-Sep-14	12-Sep-14	e-learning
MATLAB Fundamentals	MLBE	9-Dec-14	11-Dec-14	e-learning

Training courses - Adelaide

Course Name	Course Code	Start Date	End Date	City
Simulink for System and Algorithm Modeling	SLBE	21-Aug-14	22-Aug-14	Adelaide
Image Processing with MATLAB	MLIP	9-Sep-14	10-Sep-14	Adelaide
MATLAB Fundamentals	MLBE	4-Nov-14	6-Nov-14	Adelaide
Parallel Computing with MATLAB	MLPC	18-Nov-14	19-Nov-14	Adelaide

Course Name	Course Code	Start Date	End Date	City
MATLAB Programming Techniques	MLPR	12-Aug-14	13-Aug-14	e-learning
MATLAB Fundamentals	MLBE	2-Sep-14	4-Sep-14	e-learning
Simulink for System and Algorithm Modeling	SLBE	11-Sep-14	12-Sep-14	e-learning
MATLAB Fundamentals	MLBE	9-Dec-14	11-Dec-14	e-learning

Training courses - Brisbane

Course Name	Course Code	Start Date	End Date	City
Simulink for System and Algorithm Modeling	SLBE	22-Oct-14	23-Oct-14	Brisbane
Optimization Techniques in MATLAB	MLOP	24-Oct-14	24-Oct-14	Brisbane
MATLAB Fundamentals	MLBE	11-Nov-14	13-Nov-14	Brisbane

Course Name	Course Code	Start Date	End Date	City
MATLAB Programming Techniques	MLPR	12-Aug-14	13-Aug-14	e-learning
MATLAB Fundamentals	MLBE	2-Sep-14	4-Sep-14	e-learning
Simulink for System and Algorithm Modeling	SLBE	11-Sep-14	12-Sep-14	e-learning
MATLAB Fundamentals	MLBE	9-Dec-14	11-Dec-14	e-learning

Training courses - Melbourne

Course Name	Course Code	Start Date	End Date	City
MATLAB Fundamentals	MLBE	19-Aug-14	21-Aug-14	Melbourne
Building Interactive Applications in MATLAB	MLGU	22-Aug-14	22-Aug-14	Melbourne
Physical Modeling of Multidomain Systems with Simscape	SLMPM-S	22-Sep-14	22-Sep-14	Melbourne
MATLAB Programming Techniques	MLPR	23-Sep-14	24-Sep-14	Melbourne
Statistical Methods in MATLAB	MLST	25-Sep-14	26-Sep-14	Melbourne
MATLAB Fundamentals	MLBE	14-Oct-14	16-Oct-14	Melbourne
Optimization Techniques in MATLAB	MLOP	17-Oct-14	17-Oct-14	Melbourne
Parallel Computing with MATLAB	MLPC	28-Oct-14	29-Oct-14	Melbourne
Signal Processing with MATLAB	MLSG	30-Oct-14	31-Oct-14	Melbourne
Signal Processing with Simulink	SLBE-G	18-Nov-14	20-Nov-14	Melbourne

Course Name	Course Code	Start Date	End Date	City
MATLAB Programming Techniques	MLPR	12-Aug-14	13-Aug-14	e-learning
MATLAB Fundamentals	MLBE	2-Sep-14	4-Sep-14	e-learning
Simulink for System and Algorithm Modeling	SLBE	11-Sep-14	12-Sep-14	e-learning
MATLAB Fundamentals	MLBE	9-Dec-14	11-Dec-14	e-learning

Training courses - Perth

Course Name	Course Code	Start Date	End Date	City
Statistical Methods in MATLAB	MLST	26-Aug-14	27-Aug-14	Perth
Simulink for System and Algorithm Modeling	SLBE	28-Aug-14	29-Aug-14	Perth
MATLAB Fundamentals	MLBE	23-Sep-14	25-Sep-14	Perth

Course Name	Course Code	Start Date	End Date	City
MATLAB Programming Techniques	MLPR	12-Aug-14	13-Aug-14	e-learning
MATLAB Fundamentals	MLBE	2-Sep-14	4-Sep-14	e-learning
Simulink for System and Algorithm Modeling	SLBE	11-Sep-14	12-Sep-14	e-learning
MATLAB Fundamentals	MLBE	9-Dec-14	11-Dec-14	e-learning

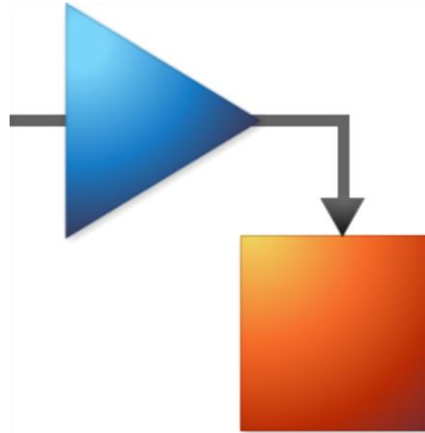
Training courses - New Zealand

Course Name	Course Code	Start Date	End Date	City
Signal Processing with Simulink	SLBE-G	3-Sep-14	5-Sep-14	Christchurch
Statistical Methods in MATLAB	MLST	7-Oct-14	8-Oct-14	Wellington

Course Name	Course Code	Start Date	End Date	City
MATLAB Programming Techniques	MLPR	12-Aug-14	13-Aug-14	e-learning
MATLAB Fundamentals	MLBE	2-Sep-14	4-Sep-14	e-learning
Simulink for System and Algorithm Modeling	SLBE	11-Sep-14	12-Sep-14	e-learning
MATLAB Fundamentals	MLBE	9-Dec-14	11-Dec-14	e-learning

Training courses - OnLine

Course Name	Course Code	Start Date	End Date	City
MATLAB Programming Techniques	MLPR	12-Aug-14	13-Aug-14	e-learning
MATLAB Fundamentals	MLBE	2-Sep-14	4-Sep-14	e-learning
Simulink for System and Algorithm Modeling	SLBE	11-Sep-14	12-Sep-14	e-learning
MATLAB Fundamentals	MLBE	9-Dec-14	11-Dec-14	e-learning



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