Simulink as Your Enterprise Simulation Platform

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Why simulation?
Hyperloop
Hyperloop is a revolutionary concept for a new type of rapid, low-energy transport system using magnetic levitation, which would be capable of transporting people and goods through extremely low-pressure tubes at speeds of up to Mach .98, or 750 mph/1,200 kmh.
Enterprise Simulation Platform

**Enterprise**: connects complete product development process

**Simulation**: evaluating system behavior through computation

**Platform**: connects all relevant domains for modelling and simulation
Enterprise Simulation Platform Enablers

Multi-Domain Modelling
Integration
Scalability
Multi-Domain Modelling
Integration
Scalability
Multi-Domain Modelling in Simulink

Dynamic Systems

Discrete-Event Systems

Physical Modelling

State Machines

Function and Object-Oriented
Need for Multi-Domain Simulation
Need for More Multi-Domain Simulation
Multi-Domain Model
State Charts and System Dynamics
Physical Modeling
Discrete-Event Modeling
Domain-Specific Extensions

Simulink has numerous domain-specific capabilities, for example:
Multi-Domain Modelling
Integration
Scalability
Integration Challenges

Your IP exists in many forms and in many locations, making integration difficult.

OEM

Colleague

Supplier

Partner
Integrating by Sharing Models

Quick File Packaging

Model Protection (IP Management)

Reporting and Documentation
Integrating Your Code

Multiple ways to reuse your legacy code with Simulink
Integrating Third-Party Simulation Tools

Mature and extensive APIs for third-party tool integration

Vehicle dynamics modeling

Tire behavior assessment

Thermo-fluid system simulation

1D / 3D engine/exhaust simulation

Virtual test driving
ADAS System Level Simulation – Lane Keeping Support at TASS

Benefits

• Use virtual driving scenario instead of real car
• Riskless test of new ADAS functions
• Analyze different environmental conditions
Multi-Domain Modelling
Integration
Scalability
Scalability Challenges

Performance

Team Workflows
Performance Scalability

Easy scalability to multicore or cluster/cloud computation environment
Performance Scalability

Big data workflow
- Processing large amount of simulation inputs / outputs

MAT file

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Complex Design Development through Componentization

- Improving performance
  - Incremental loading and code generation
  - Simulation speed
  - Memory usage

- Supporting team workflows
  - Faster modular development
  - More effective verification
  - Increased reusability
Capabilities Enabling Team Workflows

- Source control
- Design comparison and merging
- Dependency analysis
- Task automation
Source Control Integrations

Microsoft Team Foundation Server (TFS) integration available now from MathWorks File Exchange
Integrating Work from Different Engineers via Merge

- Supports concurrent engineering
- Lets you concentrate on design
Dependency Analysis – Modular Development
Dependency Analysis – Modular Development

- Show model structure
- List products required
- Highlight issues
Task Automation – Configuring Project Environment

- Robustly configure the team environment
- For everyone
- Automatically
Simulink Addressing Scalability Challenges

Performance

Team Workflows

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"No other tool gives us the multidomain simulation capability and block diagram environment in a way that is scalable to represent complex systems. That is why we use Simulink."

Andrew Pollard
Tessella
How to get started?

- Model-Based Design
- Stateflow
- Simscape