3DEXPERIENCE Platform for Systems Engineering

3DEXPERIENCE®

2017-08-08
Christopher Alain JONES

Key Takeaways about the 3DEXPERIENCE Platform

- Object & model based
- Collaborative engineering
- Digital continuity and traceability
- No silos
- Single version of the truth

Systems Engineering

Boeing signs $1 billion contract with Dassault Systemes

AFP | Updated: Jul 25, 2017, 09.56 AM IST

Boeing has signed a 30-year contract worth a billion dollars, renewable every 10 years, said Le Figaro newspaper, which is owned by the Dassault group.

PARIS: US aerospace giant Boeing has signed a billion-dollar contract with French industrial software company Dassault Systemes to modernise its production system, French media said Tuesday.

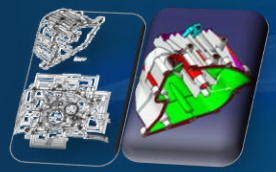
"Boeing has signed a 30-year contract worth a billion dollars, renewable every 10 years," said Le Figaro newspaper, which is owned by the Dassault group.

The partnership will focus on the use of 3D software "to design future products, to modernise the entire production system and to deploy new services".

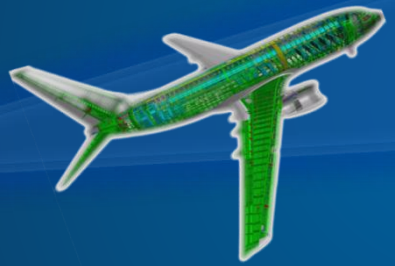
The software allows all stages of production, from the design to the management of subcontractors, to be organised across a single interface.

"From start to finish, Boeing will drive all levels of subcontracting, from the largest to the smallest, and will be able to control exchanges between its

Our Legacy



3D
Design

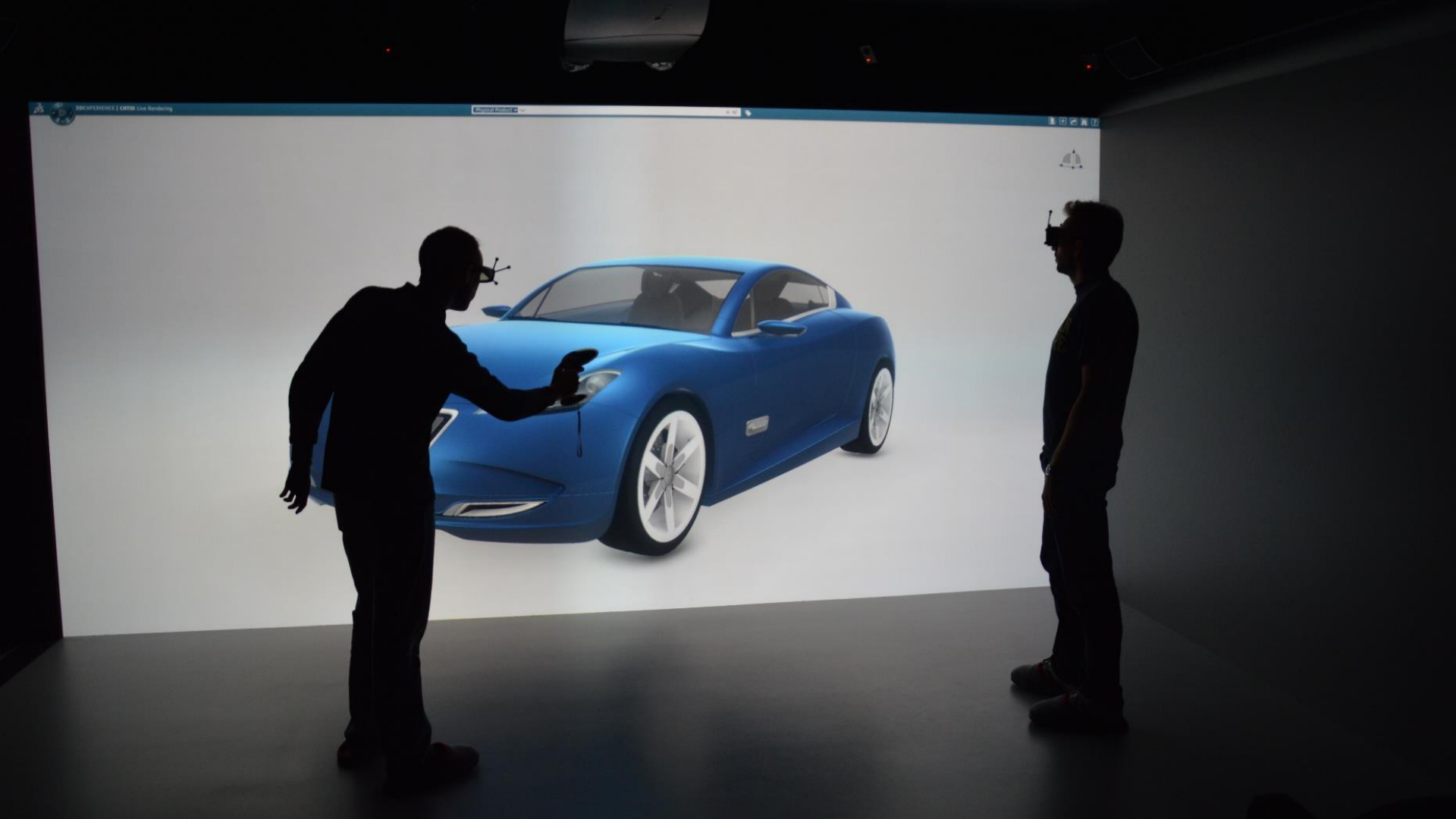


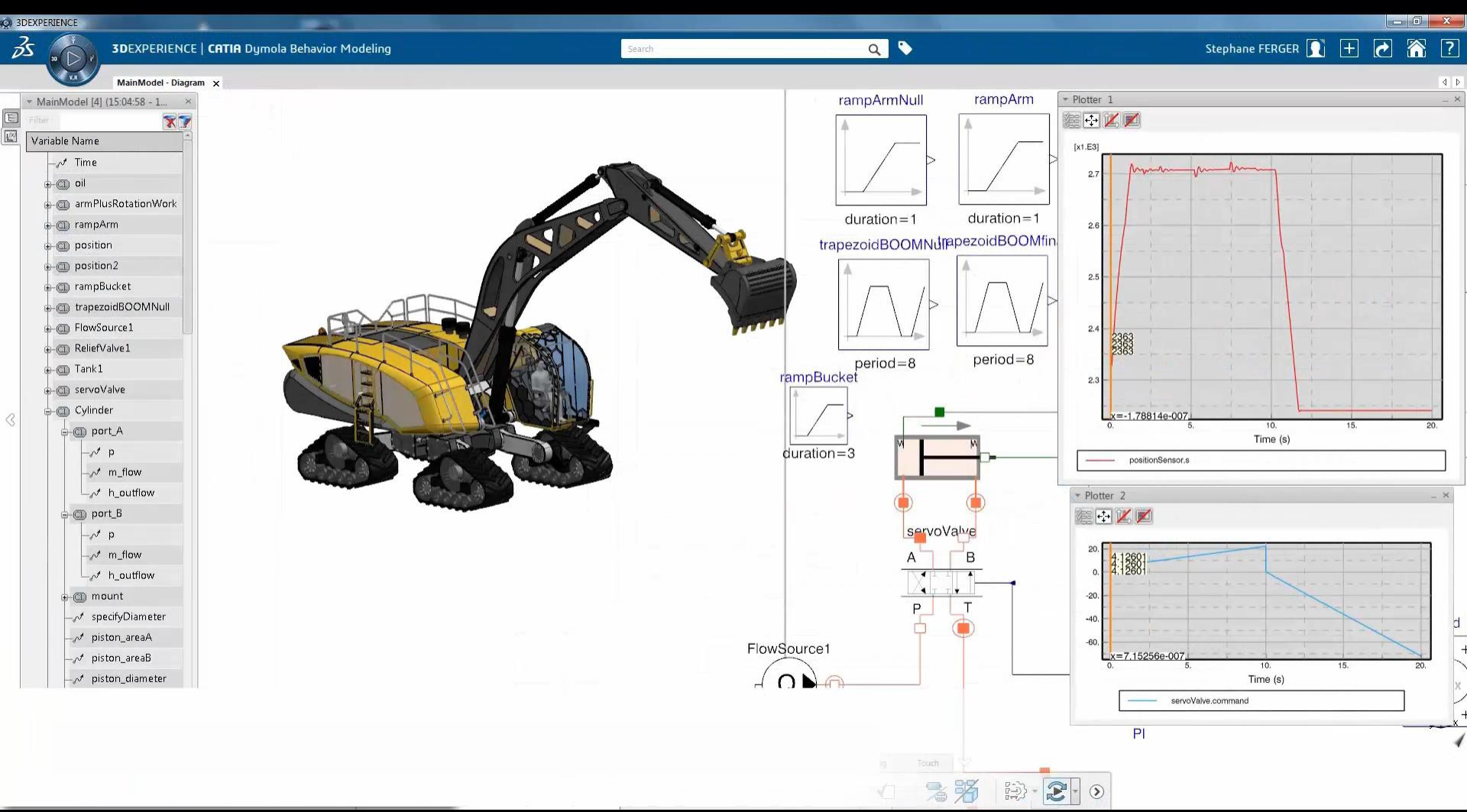
3D DMU
Digital Mock-up

3D PLM
Product Lifecycle Management

3DEXPERIENCE®
Business Experience


Time = 00.00 s


3DEXPERIENCE | CATIA Live Rendering


3DEXPERIENCE
3DEXPERIENCE | CATIA Dymola Behavior Modeling
Search
Stephane FERGER
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Variable Name
Time
oil
armPlusRotationWork
rampArm
position
position2
rampBucket
trapezoidBOOMNull
FlowSource1
ReliefValve1
Tank1
servoValve
Cylinder
port_A
p
m_flow
h_outflow
port_B
p
m_flow
h_outflow
mount
specifyDiameter
piston_areaA
piston_areaB
piston_diameter
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rampArm
duration=1
duration=1
trapezoidBOOMNull
trapezoidBOOMfin
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rampBucket
duration=3
servoValve
A
B
P
T
FlowSource1
Plotter 1
[x1.E3]
2.7
2.6
2.5
2.4
2.3
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5.
10.
15.
20.
Time (s)
positionSensor.s
Plotter 2
20.
0.
-20.
-40.
-60.
x=7.15256e-007
Time (s)
servoValve.command
PI


DASSAULT
SYSTEMES

My Roles / Profile

- Steel and Equipmt Layout Designer
- Steel Structure Designer
- Stress Engineer
- Structural Analysis Engineer
- Structural Vibration Analyst
- Structure Designer
- Systems Architecture Designer
- Systems Architecture Specifier
- Systems Schematic Designer
- Template Designer
- Transportation Designer
- Watcher

My Services

- 3DPrinting Service

My favorite apps

- Behavior Modeling
- Behavior Experience
- Functional & Logical Design
- Engineering Rules Capture
- Requirements

My 3D Modeling apps

- 2D Layout for 3D Design
- 3DPlay
- 3DPlay
- 3D Templates Capture
- Assembly Design

An Open Platform for Systems Engineering

International Council on Systems Engineering

Global Automotive Advisory Group - MBSE Working Group

ProSTEP iViP Smart Systems Engineering

OSLC · ReqIF · JIRA · OMG SysML · MATLAB Simulink · Modelica · AP233 · FMI Functional Mock-up Interface

RDF

Requirements & System Architecture

Integration, Verification and Validation

ASAM · FMI Functional Mock-up Interface

AUTOSAR — **Software**

eCAD Connectors: Cadence · Zuken · Mentor Graphics IdF — **Electronic**

ELOG · KBL — **Electrical**

mCAD Connectors: STEP · JT ISO · Creo · NX · Solid Edge — **Mechanical**

Adopt and Drive **Standards** with **Industry Communities**

Provide **Connectors** to external tools used by experts, **powered by 3DEXPERIENCE Platform**

DASSAULT SYSTEMES

CPO CODE of PLM OPENNESS

Dassault Systèmes Supports Industry Commitment to Codex of PLM Openness "Critical to Collaboration and Innovation"

Dassault Systèmes Signs CPO and Continues Role as a Core Member of Codex Effort

STUTTGART, Germany and VÉLIZY-VILLACOUBLAY, France - May 2nd, 2012 - Dassault Systèmes (Euronext Paris: #13065, DSY.PA), a world leader in 3D design, 3D Digital Mock Up and Product Lifecycle Management (PLM) solutions, today announced its ongoing commitment to PLM openness by continuing to support the next phases of the Codex of PLM Openness (CPO), an initiative driven by automotive OEMs, suppliers and the ProSTEP iViP association.

In 2011, when industry standards association ProSTEP iViP and several German automotive OEMs began developing the idea of an initiative dedicated to defining and addressing problems and standards for product data management and virtual product

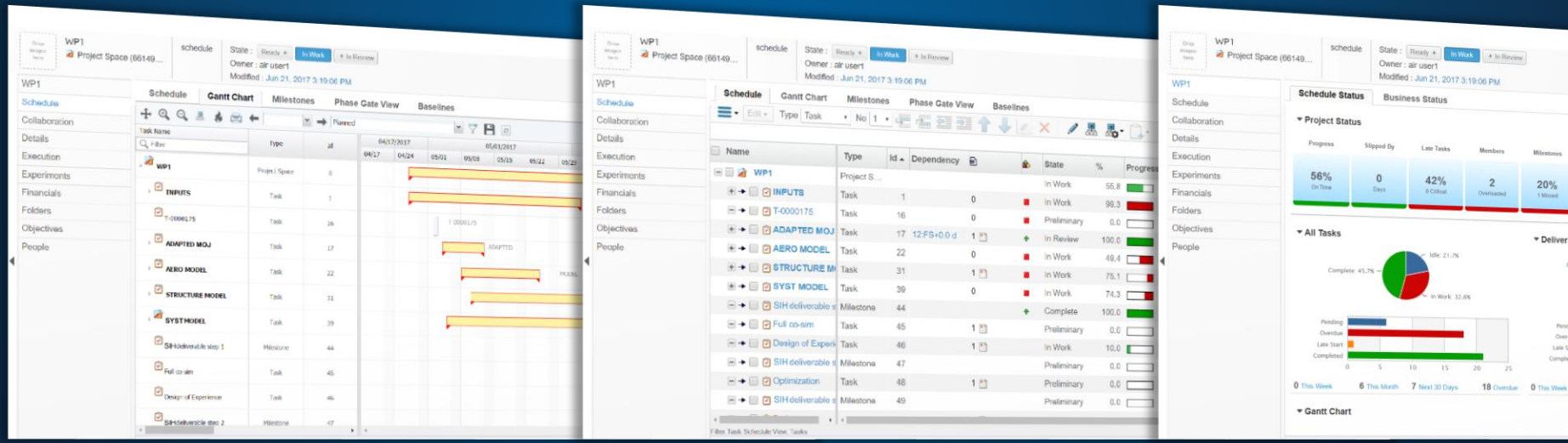
DASSAULT SYSTEMES | The 3DEXPERIENCE® Company

Social Collaboration

- Communities
- 3DComment
- Wikis
- 3DNotification
- Crowdsourcing of ideas
- Dashboards
- 3DMessaging
- …

Governance

- Configuration-, Lifecycle-, Change-, Program- Management
- ...



Generational changes with 3DEXPERIENCE

from…

file-based

static designs

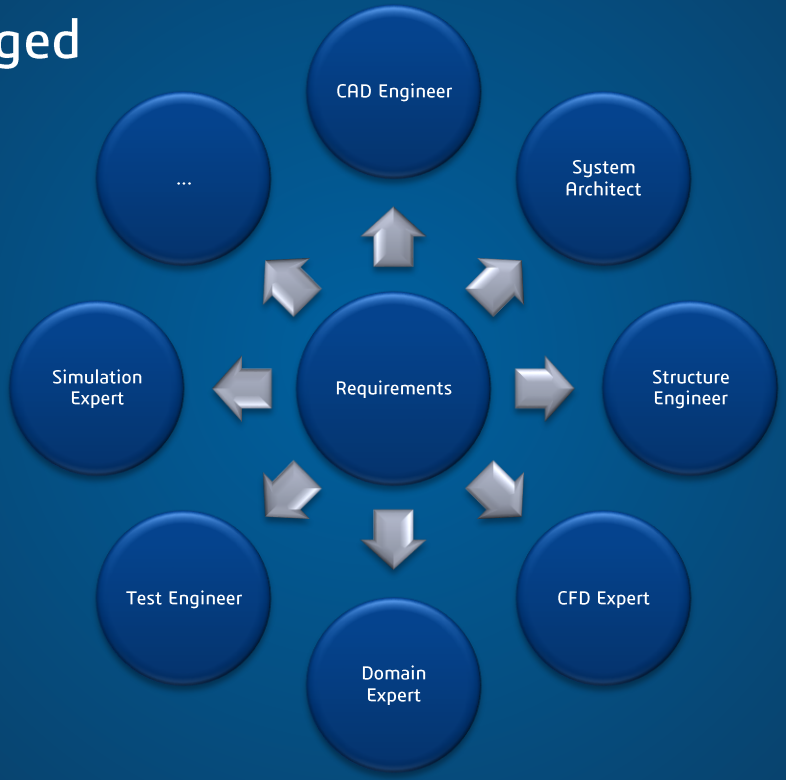
to…

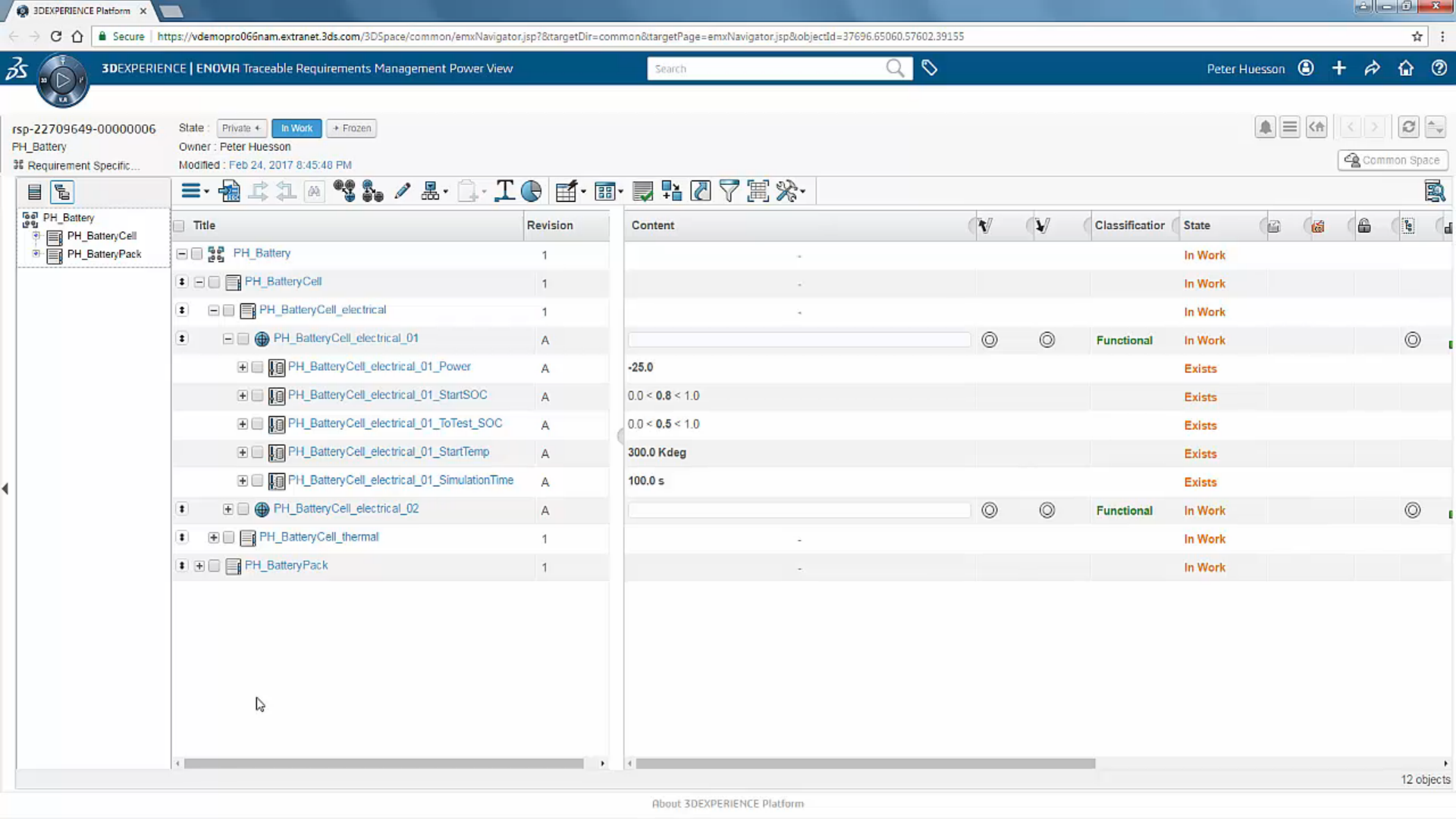
data-driven
online global single instance innovation platform

model-based
combining multi-physics, behavior modeling, big data, social collaboration, intuitive decision support

Tear Down the Silo-Walls

- Centrally managed
  - Requirements
  - Parameters
  - Test-cases




3DEXPERIENCE Platform
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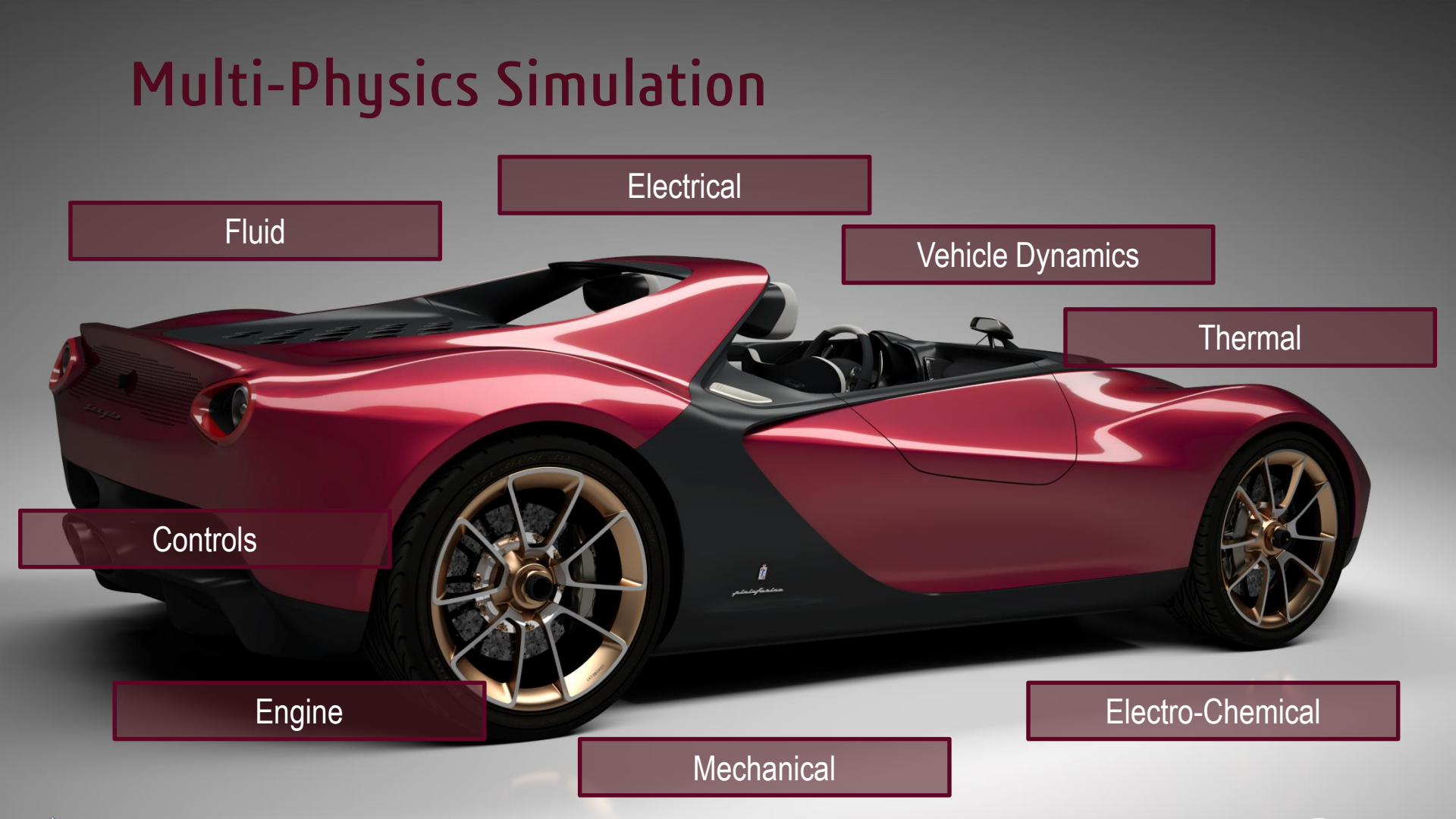
3DEXPERIENCE | ENOVIA Traceable Requirements Management Power View
Search
Peter Huesson
rsp-22709649-00000006
PH_Battery
Requirement Specific...
State : Private + In Work + Frozen
Owner : Peter Huesson
Modified : Feb 24, 2017 8:45:48 PM
Common Space
PH_Battery
PH_BatteryCell
PH_BatteryPack
Title
Revision
Content
Classification
State
PH_Battery 1 - In Work
PH_BatteryCell 1 - In Work
PH_BatteryCell_electrical 1 - In Work
PH_BatteryCell_electrical_01 A Functional In Work
PH_BatteryCell_electrical_01_Power A -25.0 Exists
PH_BatteryCell_electrical_01_StartSOC A 0.0 < 0.8 < 1.0 Exists
PH_BatteryCell_electrical_01_ToTest_SOC A 0.0 < 0.5 < 1.0 Exists
PH_BatteryCell_electrical_01_StartTemp A 300.0 Kdeg Exists
PH_BatteryCell_electrical_01_SimulationTime A 100.0 s Exists
PH_BatteryCell_electrical_02 A Functional In Work
PH_BatteryCell_thermal 1 - In Work
PH_BatteryPack 1 - In Work
12 objects
About 3DEXPERIENCE Platform

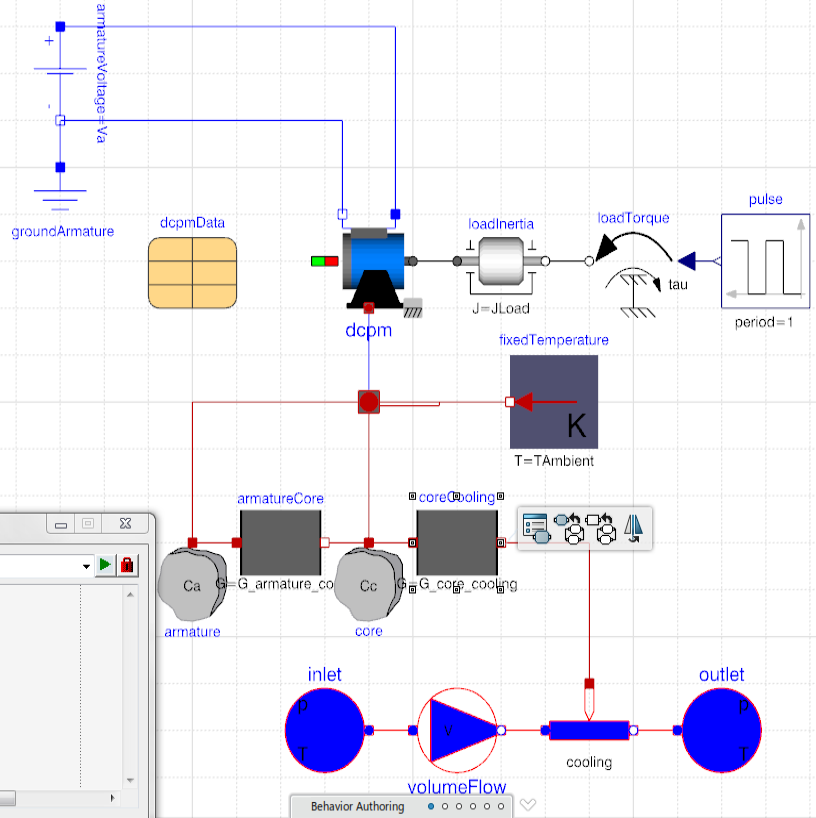
Multi-Physics Simulation



DCPM_Cooling [1] (13:51:41 - 15/11/16)

Filter :

Variable Name	Value	U...t
brush		
core		
strayLoad		
thermalPort		
flange		
phi	0	rad
tau	-47.745	N.m
TpmOperational	293.15	K
airGapDC		
eGround		
ie		
va	100	V
pin_ap		
armatureVoltage		
groundArmature		
loadInertia		
loadTorque		



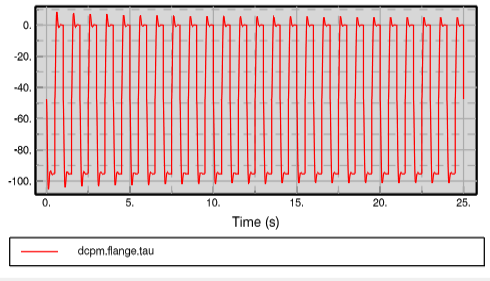
Modelica Editor

Modelica.Thermal.HeatTransfer.Components.ThermalConductor

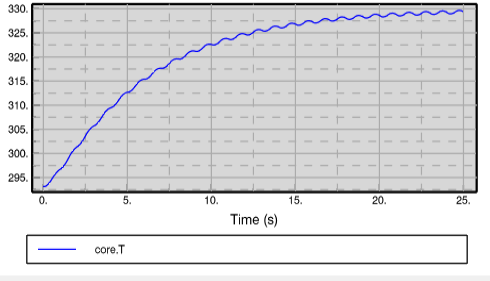
```
model ThermalConductor
  "Lumped thermal element transporting heat without storing it"
  extends Interfaces.Element1D;
  parameter Modelica.SIunits.ThermalConductance G
    "Constant thermal conductance of material";

equation
  Q_flow = G*dT;
  a
end ThermalConductor;
```

OK Apply Cancel

Plotter 1



Plotter 2



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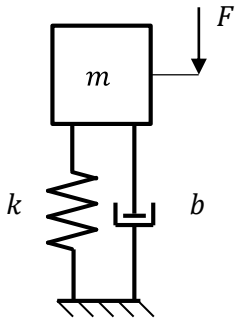
SimulationReadyState

Modelica

- A-causal object-oriented modelling language
- Inherently multiphysical
- Maintained by the Modelica Association
- There are both free and commercial libraries for a wide range of topics
- Modelica language is non-proprietary
- Several commercial Modelica simulation environments



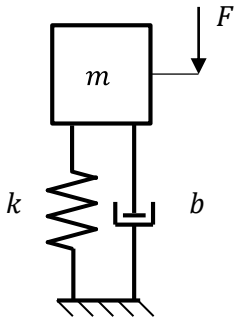
Component equations

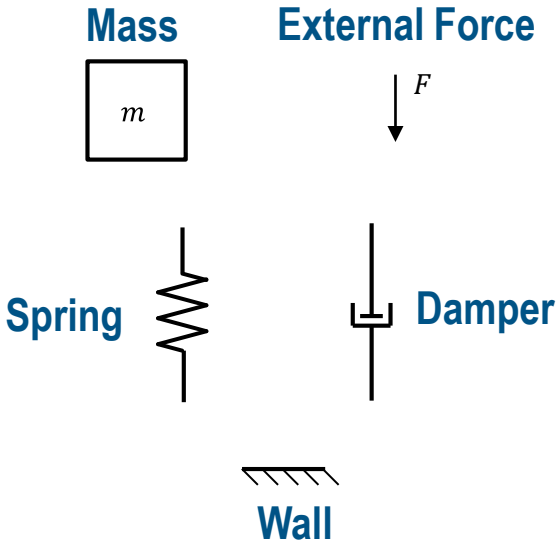
$$F_g = m \cdot g$$
$$F_k = k \cdot x$$
$$F_b = b \cdot \dot{x}$$
$$F_a = m \cdot \ddot{x}$$

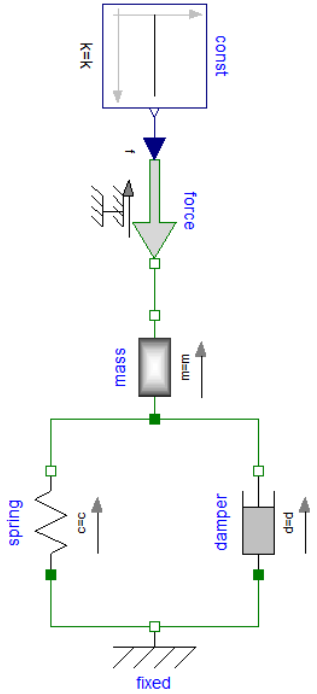
$$F + F_g - F_k - F_b - F_a = 0$$

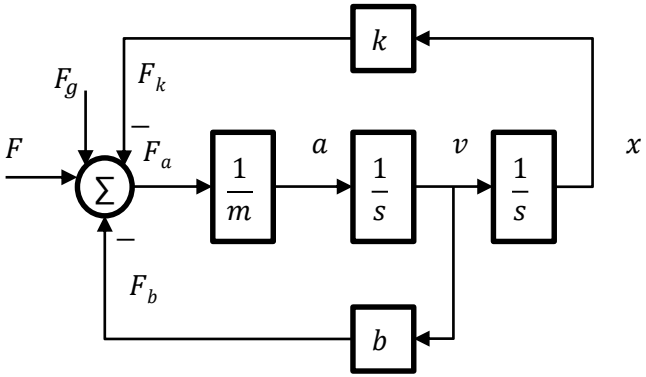
Topology equation

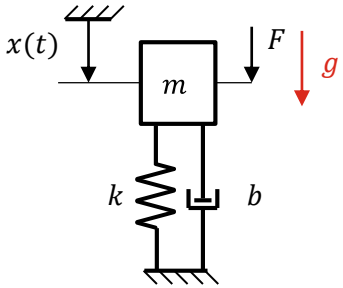
Identifying Components



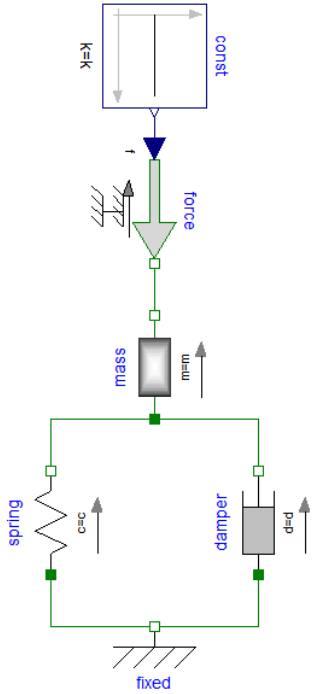


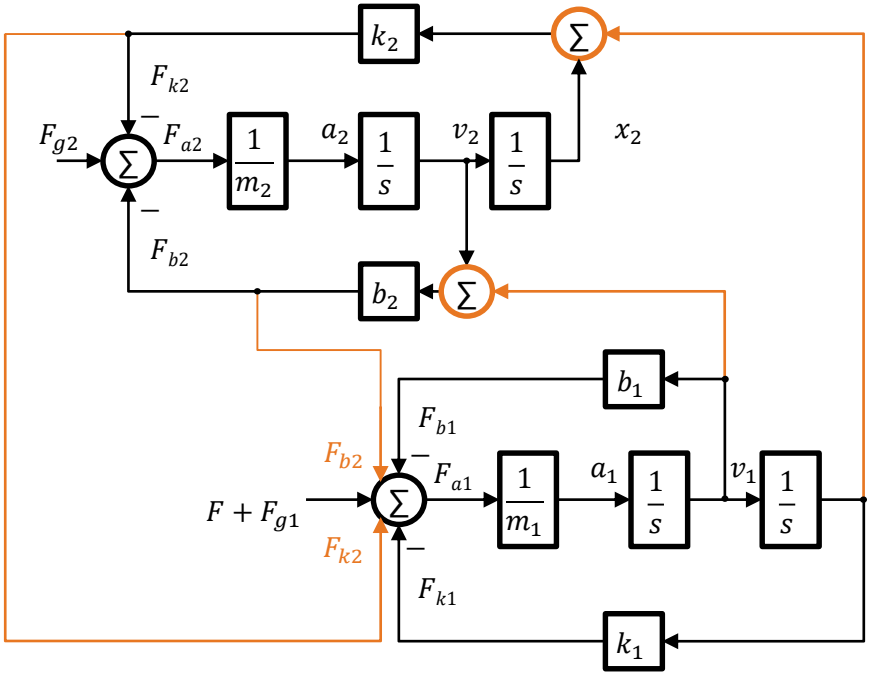


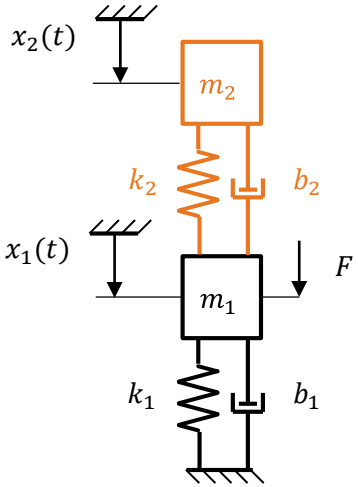




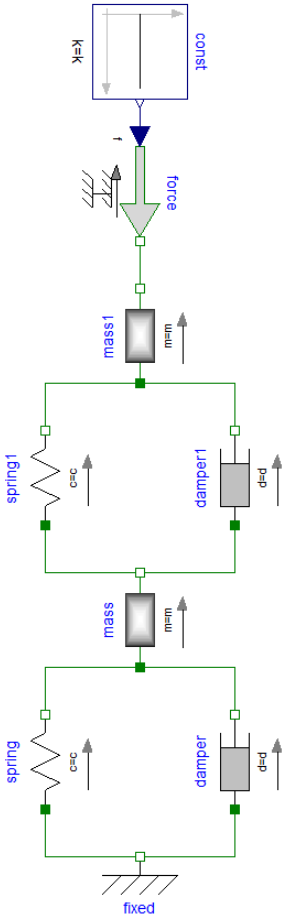
$$x(0) = \dot{x}(0) = \ddot{x}(0) = 0$$

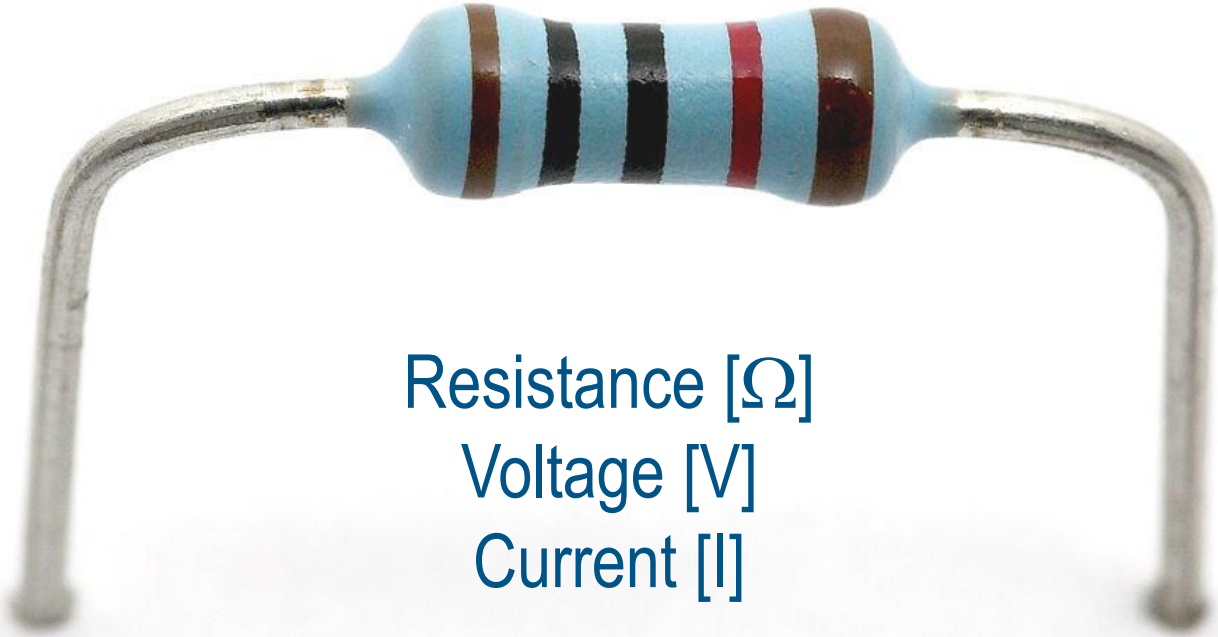






$$x_1(0) = \dot{x_1}(0) = \ddot{x_1}(0) = 0$$





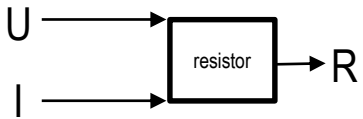
Resistance [Ω]

Voltage [V]

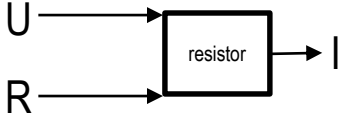
Current [I]

Comparison

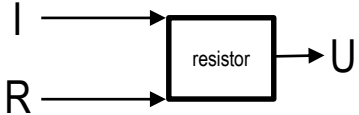
Causal



$$R := U/I$$

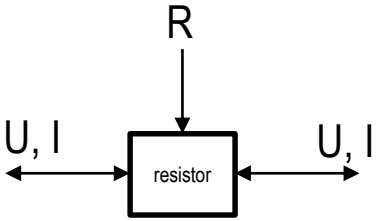


$$I := U/R$$

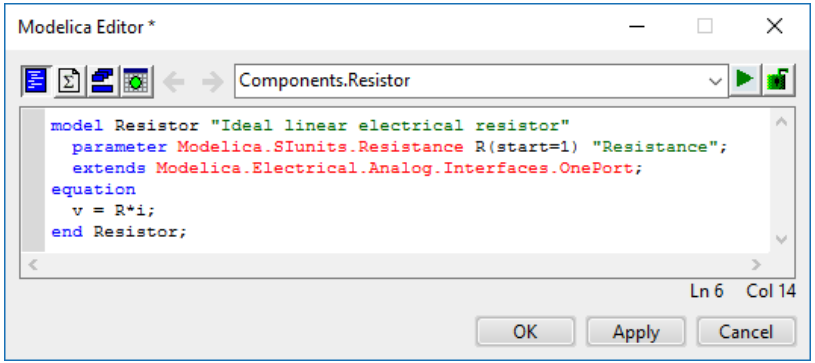


$$U := R * I$$

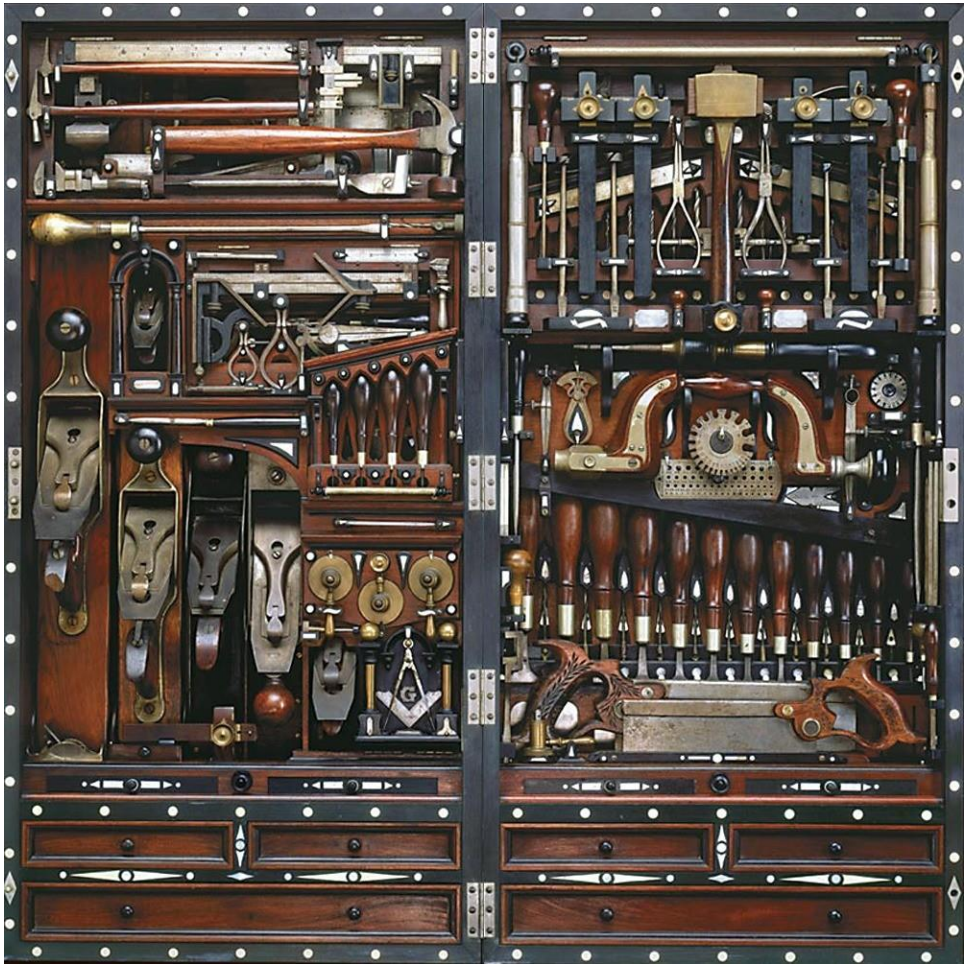
A-Causal – Dymola



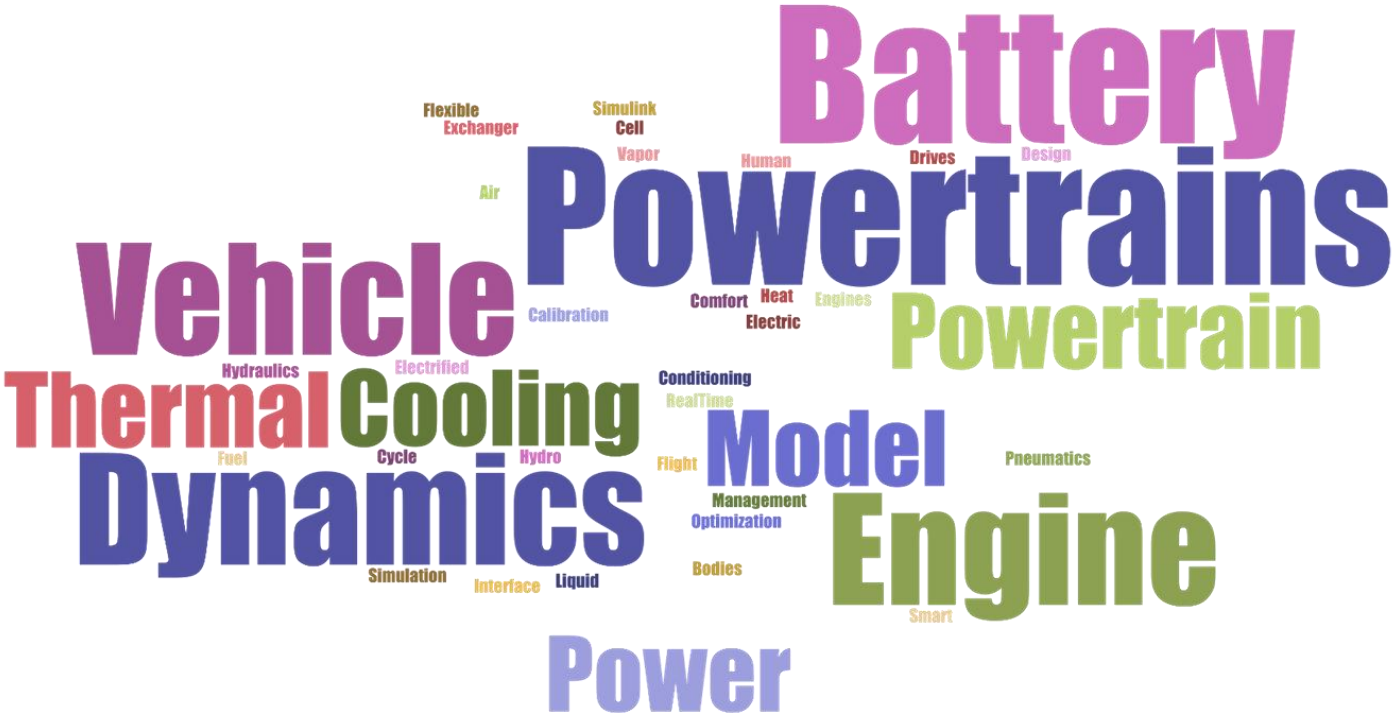
$$U = R * I$$




LEGO



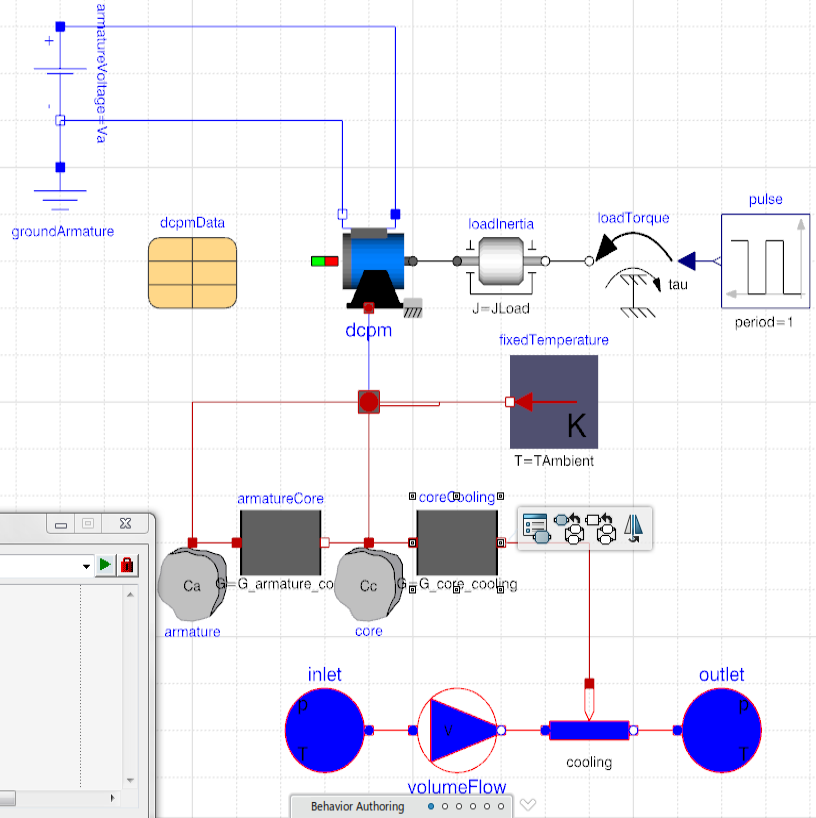
Libraries



DCPM_Cooling [1] (13:51:41 - 15/11/16)

Filter :

Variable Name	Value	U...t
brush		
core		
strayLoad		
thermalPort		
flange		
phi	0	rad
tau	-47.745	N.m
TpmOperational	293.15	K
airGapDC		
eGround		
ie		
va	100	V
pin_ap		
armatureVoltage		
groundArmature		
loadInertia		
loadTorque		



Modelica Editor

Modelica.Thermal.HeatTransfer.Components.ThermalConductor

```
model ThermalConductor
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  parameter Modelica.SIunits.ThermalConductance G
    "Constant thermal conductance of material";

equation
  Q_flow = G*dT;
  a
end ThermalConductor;
```
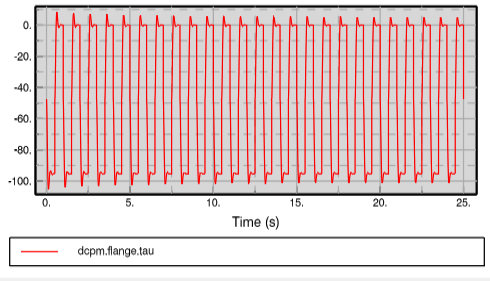
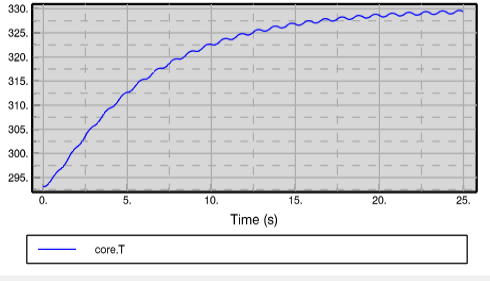

OK Apply Cancel

Plotter 1



Plotter 2



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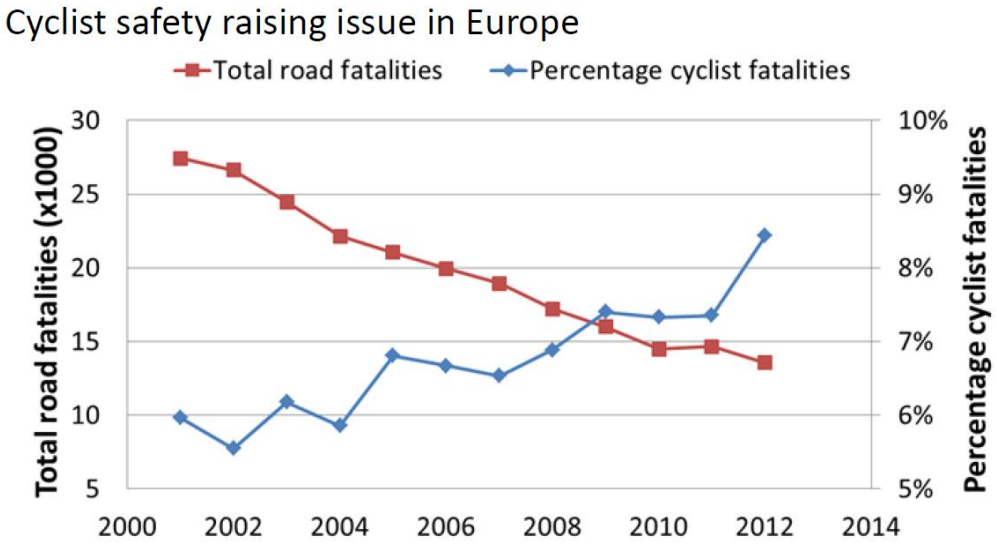
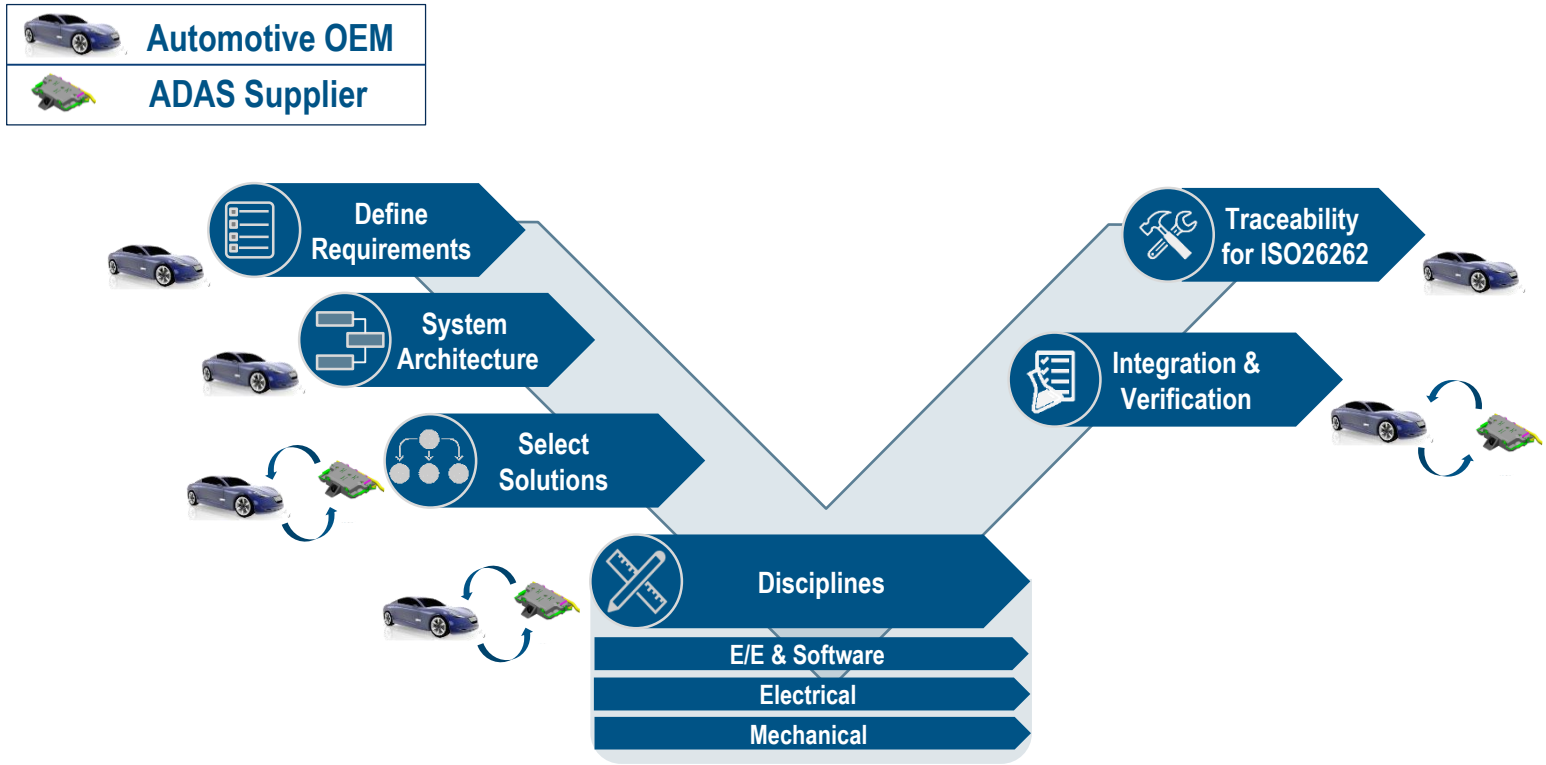
SimulationReadyState

Demonstration Scenario

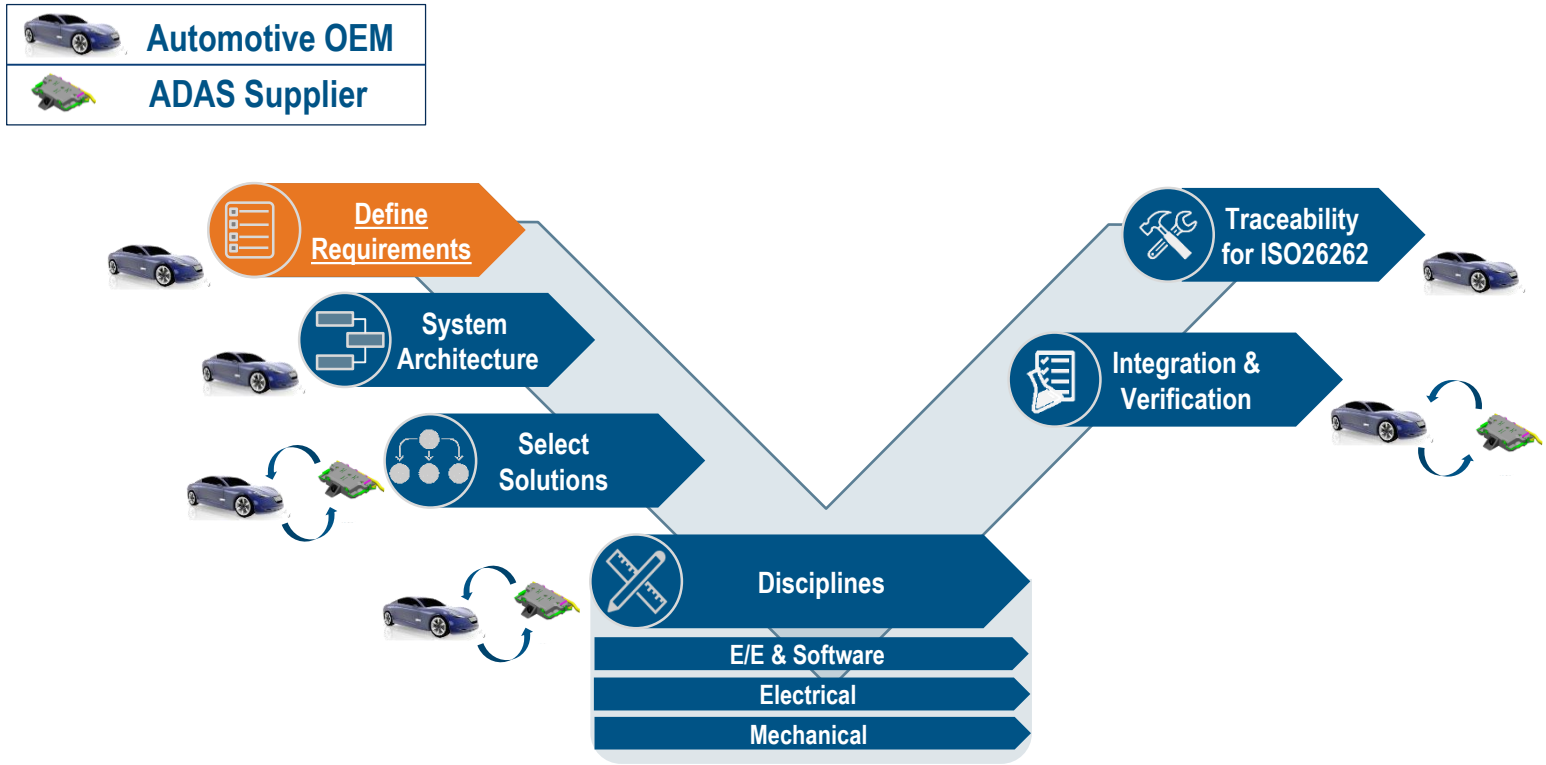
CATS Project: Develop **C**yclist-**A**EB **T**esting **S**ystem



Demonstration Scenario



Demonstration Scenario



Smart, Safe & Connected

https://vdemopro387dsy.extranet.3ds.com/3DDashboard/#dashboard:56335289-ca05-45bd-8ebb-eebb1d0286a3/1%2e%20Market%20%26%20Social%20Listening

3DEXPERIENCE | 3DDashboard Smart, Safe & Connected Car

Search

Guillaume BELLONCLE

0. Scenario | 1. Market & Social Listening | 2. Systems Engineering | 3. Systems Architecture | 4. EE Architecture | 5. Components Deliveries | 6. ISO26262 Traceability | 7. Car Programs | 8. Content Management

Web Page Reader - NETVIBES | Social Trends on Mobility

NETVIBES - Feed Reader - NHTSA Safety

- Crash Warning Interfaces and Connected Vehicle Human Factors
- Heavy Vehicle Research - Tires — Heavy Vehicle Research ? Tires
- Vehicle-Based Safety Systems
- Crash Avoidance Research Program
- Light Vehicle Research - Rollover and Stability Control
- Active Braking Technologies

NETVIBES - Feed Reader - Technology Benchmark

Quick Links - New Regulations for Active Safety

- NHTSA - AEB to become mandato... http://www.nhtsa.gov/About+NH...
- Euro NCAP 2016-2020 Roadmap http://www.gizmag.com/euro-ncap-
- Euro NCAP Active Safety Awards http://www.euroncap.com/en/vehicle-
- UN - Regulations http://www.unece.org/fileadmin/DAM/trans/main/wp29/...

Web Page Reader - CATS Cyclist Safety

NETVIBES - Feed Reader - Mobility Disruption

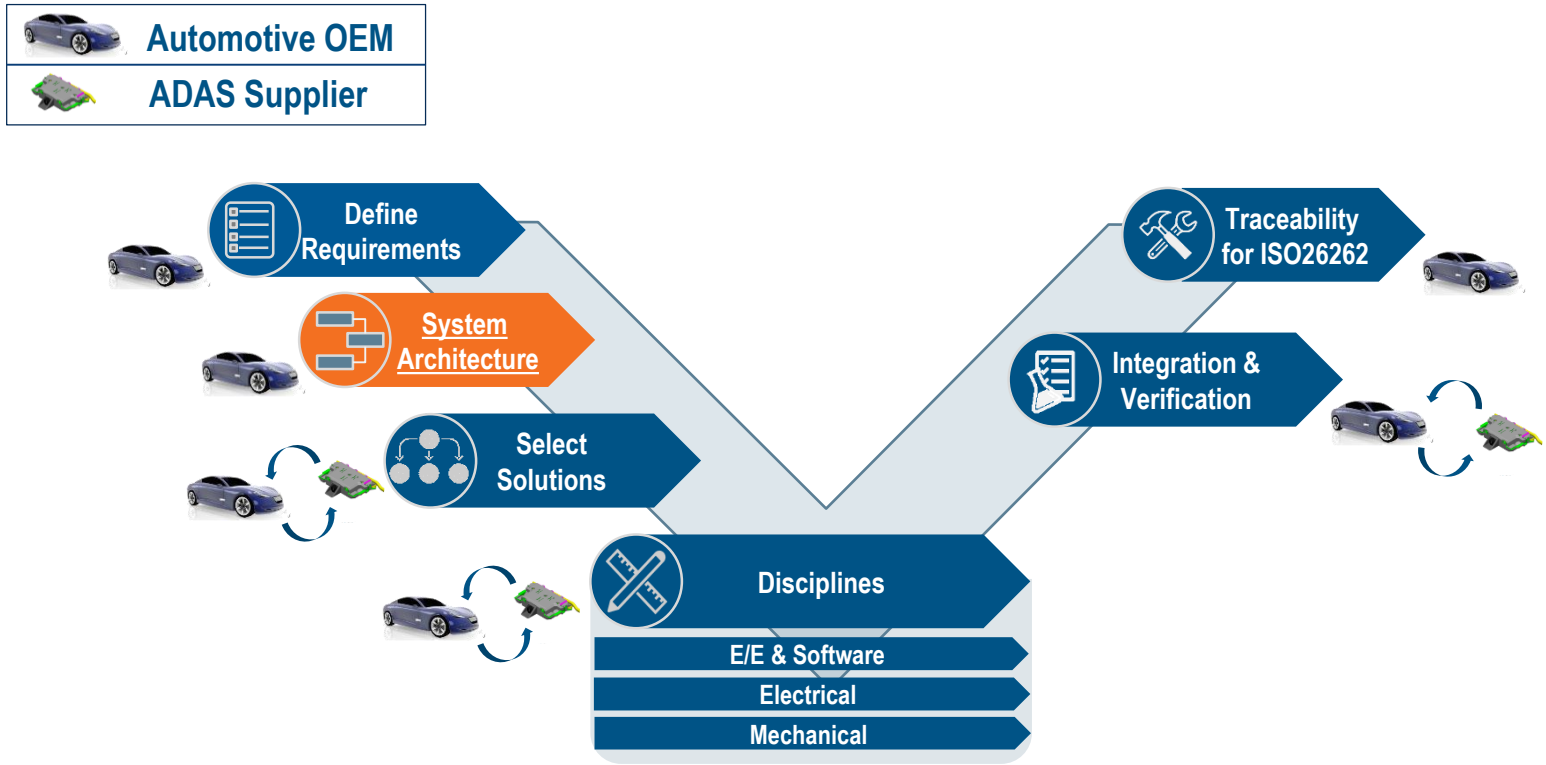
ENOVIA - My Models

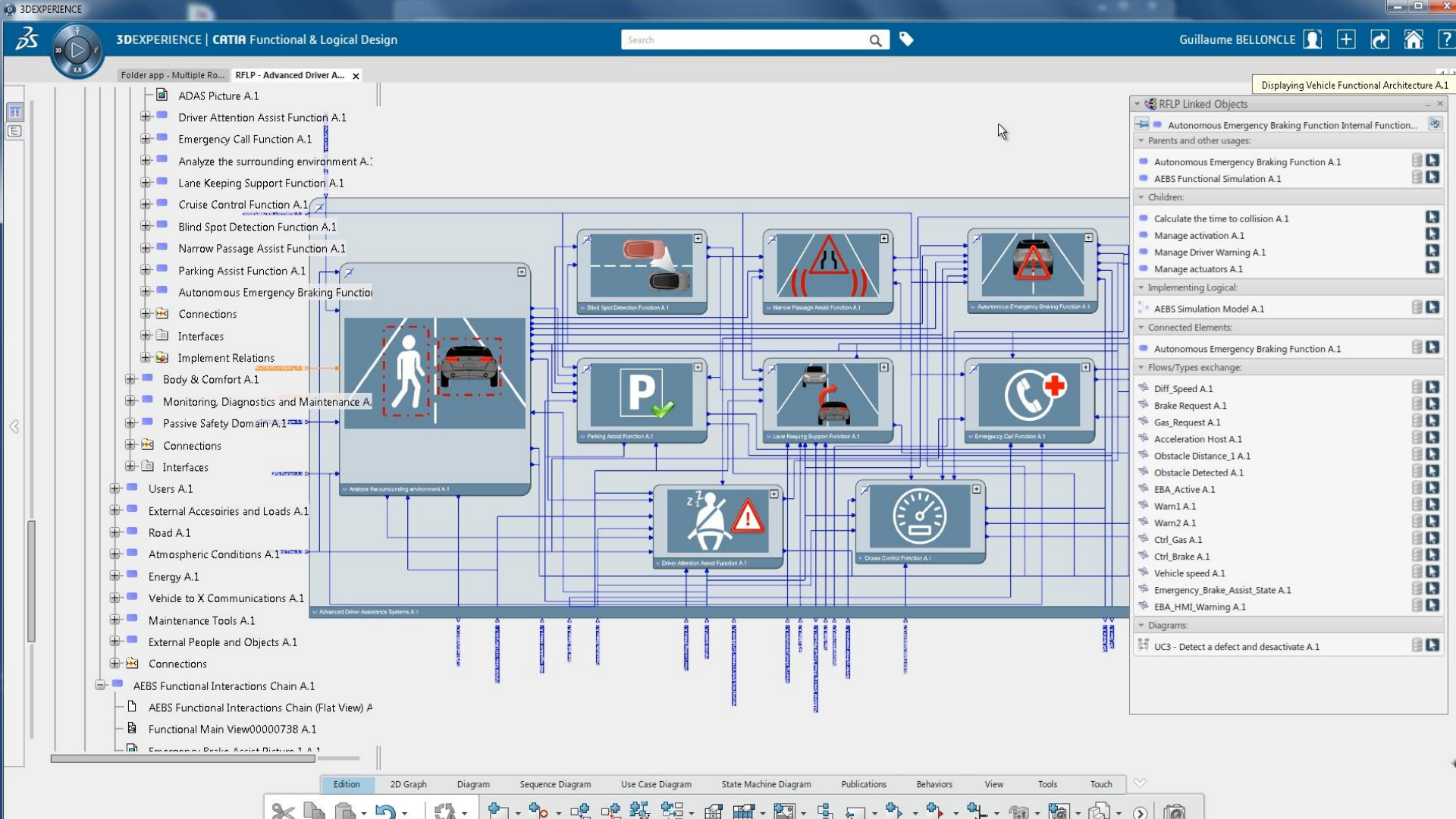
Name Bleu
Model Prefix X6_
Description

State Preliminary
Owner Karl Product Manager

Product Line Coupe
Configuration Features Evo

Demonstration Scenario

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Search
Guillaume BELLONCLE
Folder app - Multiple Ro...
RFLP - Advanced Driver A...
Displaying Vehicle Functional Architecture A.1
ADAS Picture A.1
Driver Attention Assist Function A.1
Emergency Call Function A.1
Analyze the surrounding environment A.1
Lane Keeping Support Function A.1
Cruise Control Function A.1
Blind Spot Detection Function A.1
Narrow Passage Assist Function A.1
Parking Assist Function A.1
Autonomous Emergency Braking Function
Connections
Interfaces
Implement Relations
Body & Comfort A.1
Monitoring, Diagnostics and Maintenance A.
Passive Safety Domain A.1
Connections
Interfaces
Users A.1
External Accesoiries and Loads A.1
Road A.1
Atmospheric Conditions A.1
Energy A.1
Vehicle to X Communications A.1
Maintenance Tools A.1
External People and Objects A.1
Connections
AEBS Functional Interactions Chain A.1
AEBS Functional Interactions Chain (Flat View) A
Functional Main View00000738 A.1
RFLP Linked Objects
Autonomous Emergency Braking Function Internal Function...
Parents and other usages:
Autonomous Emergency Braking Function A.1
AEBS Functional Simulation A.1
Children:
Calculate the time to collision A.1
Manage activation A.1
Manage Driver Warning A.1
Manage actuators A.1
Implementing Logical:
AEBS Simulation Model A.1
Connected Elements:
Autonomous Emergency Braking Function A.1
Flows/Types exchange:
Diff_Speed A.1
Brake Request A.1
Gas_Request A.1
Acceleration Host A.1
Obstacle Distance_1 A.1
Obstacle Detected A.1
EBA_Active A.1
Warn1 A.1
Warn2 A.1
Ctrl_Gas A.1
Ctrl_Brake A.1
Vehicle speed A.1
Emergency_Brake_Assist_State A.1
EBA_HMI_Warning A.1
Diagrams:
UC3 - Detect a defect and desactivate A.1
Edition
2D Graph
Diagram
Sequence Diagram
Use Case Diagram
State Machine Diagram
Publications
Behaviors
View
Tools
Touch

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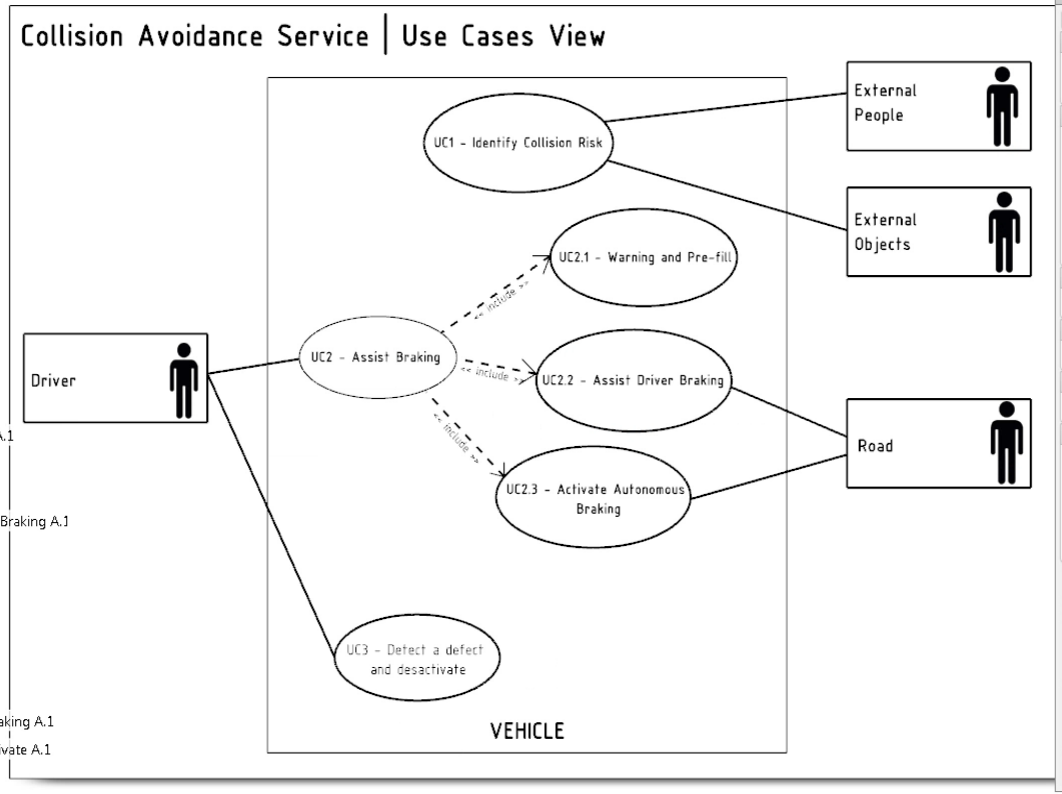
- External People A.1
- External Objects A.1
- Road A.1
- Vehicle to X Communications A.1
- Connections
- Implement Relations
- Service A.1
  - Functional Main View00000495 A.1
  - Services A.1
- Safe & Efficient Driving Experience A.1
  - Functional Main View00000528 A.1
  - Driving Experience A.1
  - Parking Valet A.1
  - Automated Manoeuver A.1
  - Trafic Jam Assistant A.1
  - Collision Avoidance A.1
    - Functional Main View00000533 A.1
    - Functional Symbol00000021 A.1
      - Symbol Reference.1
    - Provide Autonomous Emergency Braking A.1
    - Use Cases A.1
      - Use Cases View A.1
    - UC1 - Identify Collision Risk A.1
    - UC2 - Assist Braking A.1
    - UC2.1 - Warning and Pre-fill A.1
    - UC2.2 - Assist Driver Braking A.1
    - UC2.3 - Activate Autonomous Braking A.1
    - UC3 - Detect a defect and desactivate A.1
    - Interfaces
  - Performance Driving A.1
  - Enhance Vision on the road A.1



RFLP Linked Objects

Collision Avoidance A.1

Parents and other usages:
- Safe & Efficient Driving Experience A.1
- AEBS Environment A.1

Children:
- UC1 - Identify Collision Risk A.1
- UC2 - Assist Braking A.1
- UC2.1 - Warning and Pre-fill A.1
- UC2.2 - Assist Driver Braking A.1
- UC2.3 - Activate Autonomous Braking A.1
- UC3 - Detect a defect and desactivate A.1

Implemented Requirement Group Content:
- Collision Avoidance Service Specification 1

Implemented Service Instance:
- Provide Safe, Connected & Cost-Efficient Experience to Use...

Implementing Function:
- AEBS Functional Interactions Chain A.1

Flows/Types exchange:
- Information A.1
- Obstacles A.1
- Obstacles A.1
- Communication Data Emission A.1
- Road Effort A.1

Edition | 2D Graph | Diagram | Sequence Diagram | Use Case Diagram | State Machine Diagram | Publications | Behaviors | View | Tools | Touch

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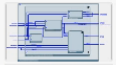
Autonomous Emergency Braking Function A.1

Main view

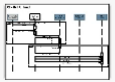


Internal Block Di...

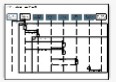
Presentation view

Context View A.1

Sequence diagram view



UC1 - Identify Ha...



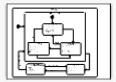
UC2.1 - Warning...

UC2.2 - Assist Driv...

UC2.3 - Activate ...

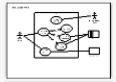
UC3 - Detect a de...

State machine diagram view



State Machine Vi...

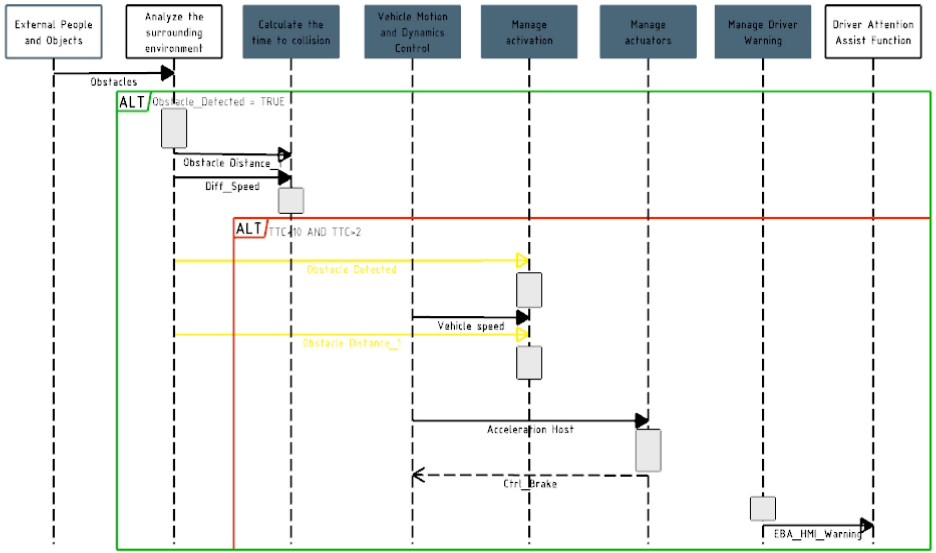
Use case diagram view



Use Cases View A.1

Allocation view

UC2.1 - Warning and Pre-fill



RFLP Linked Objects

UC2.1 - Warning and Pre-fill A.1

Parents and other usages:

UC2.1 - Warning and Pre-fill A.1

Presented:

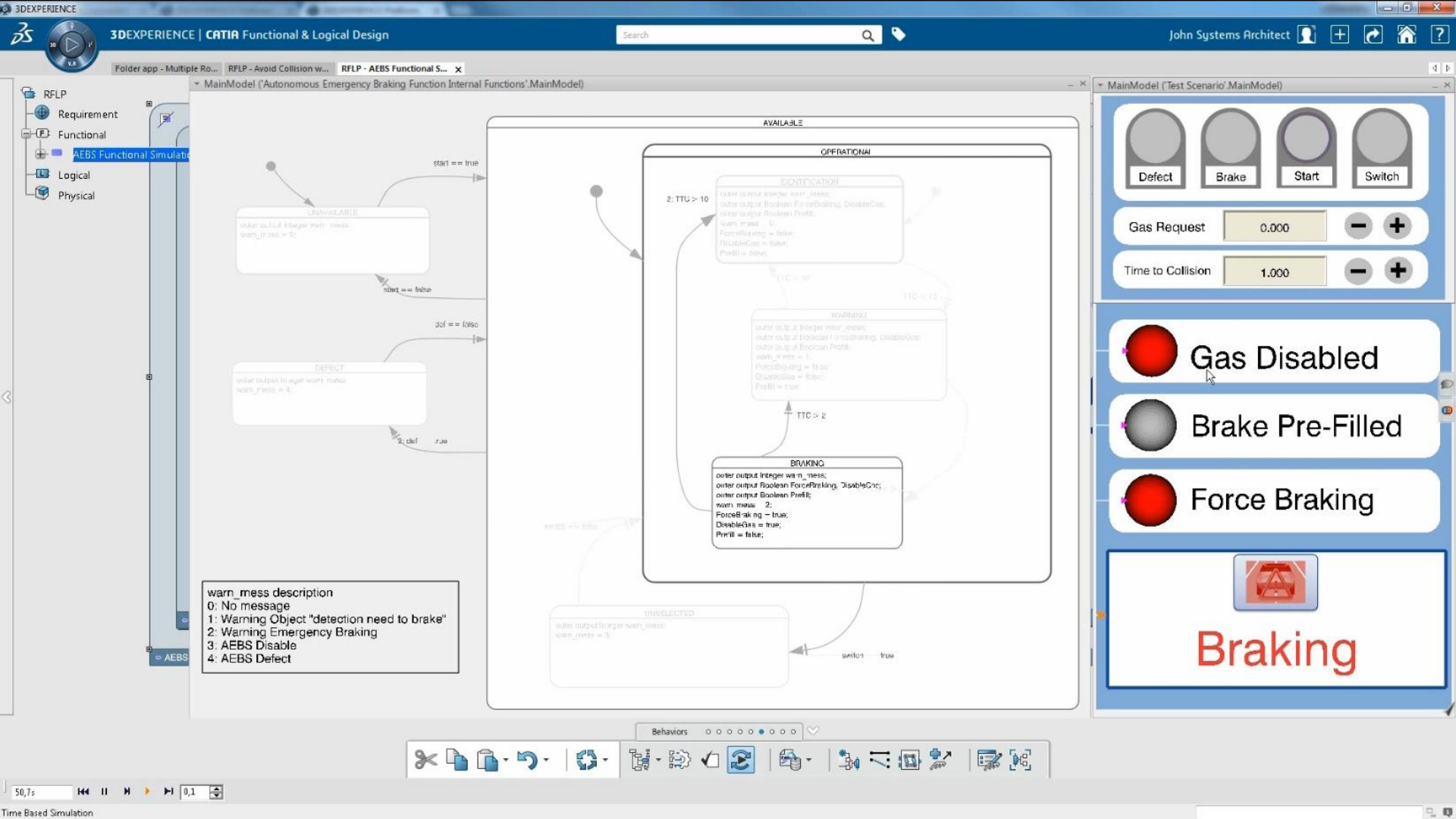
- Analyze the surrounding environment A.1
- Calculate the time to collision A.1
- Manage activation A.1
- Manage Driver Warning A.1
- Driver Attention Assist Function A.1
- External People and Objects A.1
- Manage actuators A.1
- Vehicle Motion and Dynamics Control A.1

B.1 Essentials

Sequence Diagram : Guard Review

- Valid guard
- Guard with crossing object(s)
- Crossing object
- Break guard not included in loop guard
- Empty Guard

Edition | 2D Graph | Diagram | Sequence Diagram | Use Case Diagram | State Machine Diagram | Publications | Behaviors | View | Tools | Touch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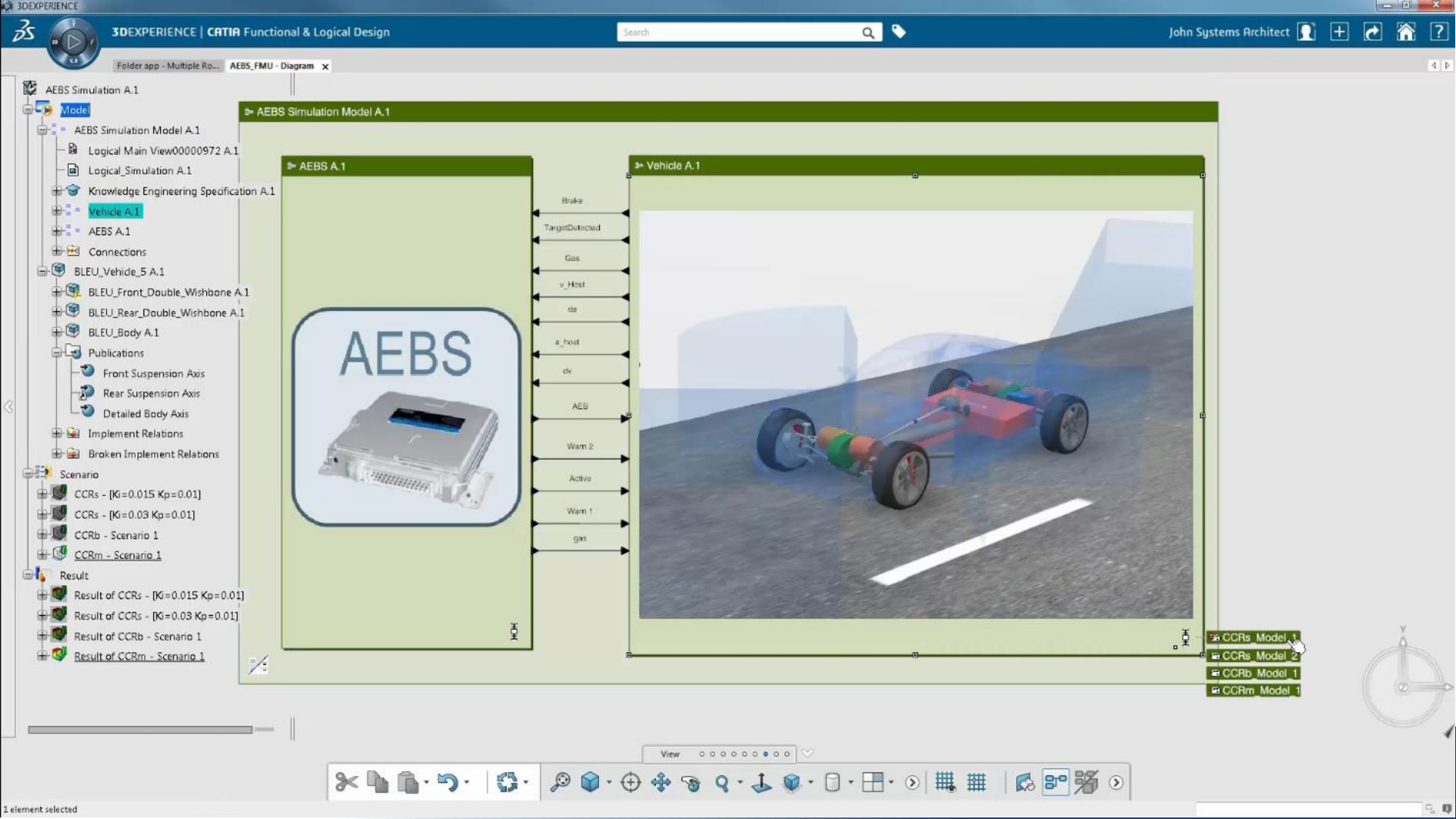
RFLP
Requirement
Functional
AEBS Functional Simulatio
Logical
Physical
MainModel ('Autonomous Emergency Braking Function Internal Functions'.MainModel)
AVAILABLE
OPERATIONAL
UNAVAILABLE
DEFECT
UNSELECTED
IDENTIFICATION
WARNING
BRAKING
start == true
start == false
def == false
2: TTC > 10
TTC > 2
outer output Integer warn_mess;
outer output Boolean ForceBraking, DisableGas;
outer output Boolean Prefill;
warn_mess = 2;
ForceBraking = true;
DisableGas = true;
Prefill = false;
warn_mess description
0: No message
1: Warning Object "detection need to brake"
2: Warning Emergency Braking
3: AEBS Disable
4: AEBS Defect
MainModel ('Test Scenario'.MainModel)
Defect
Brake
Start
Switch
Gas Request
0.000
Time to Collision
1.000
Gas Disabled
Brake Pre-Filled
Force Braking
Braking
Behaviors
Time Based Simulation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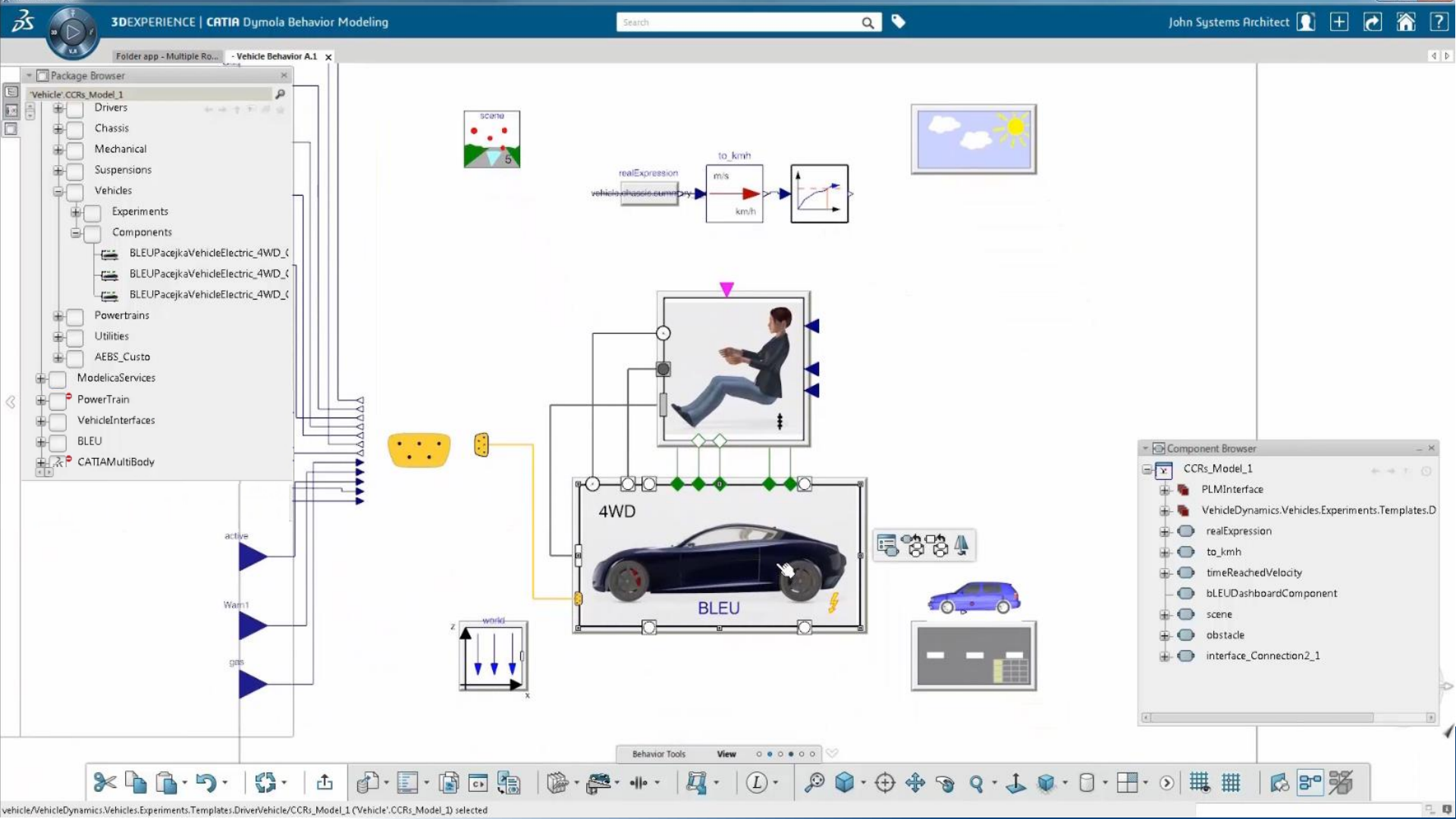
AEBS_FMU - Diagram
AEBS Simulation A.1
Model
AEBS Simulation Model A.1
Logical Main View00000972 A.1
Logical_Simulation A.1
Knowledge Engineering Specification A.1
Vehicle A.1
AEBS A.1
Connections
BLEU_Vehicle_5 A.1
BLEU_Front_Double_Wishbone A.1
BLEU_Rear_Double_Wishbone A.1
BLEU_Body A.1
Publications
Front Suspension Axis
Rear Suspension Axis
Detailed Body Axis
Implement Relations
Broken Implement Relations
Scenario
CCRs - [Ki=0.015 Kp=0.01]
CCRs - [Ki=0.03 Kp=0.01]
CCRb - Scenario 1
CCRm - Scenario 1
Result
Result of CCRs - [Ki=0.015 Kp=0.01]
Result of CCRs - [Ki=0.03 Kp=0.01]
Result of CCRb - Scenario 1
Result of CCRm - Scenario 1
AEBS Simulation Model A.1
AEBS A.1
AEBS
Vehicle A.1
Brake
TargetDetected
Gas
v_Host
dx
a_host
dv
AEB
Warn 2
Active
Warn 1
gas
CCRs_Model_1
CCRs_Model_2
CCRb_Model_1
CCRm_Model_1
View
1 element selected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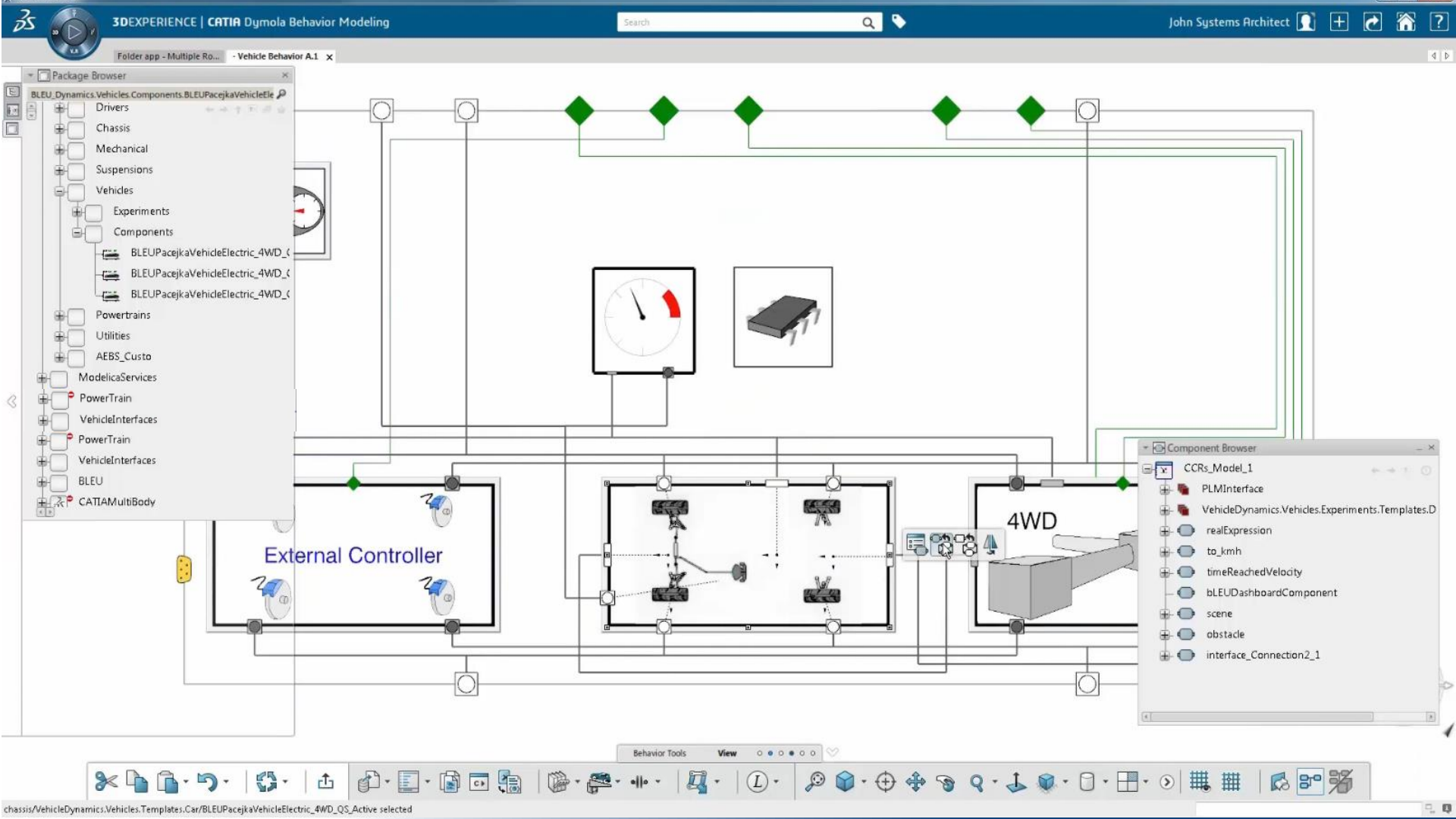
- Vehicle Behavior A.1
Package Browser
'Vehicle'.CCRs_Model_1
Drivers
Chassis
Mechanical
Suspensions
Vehicles
Experiments
Components
BLEUPacejkaVehicleElectric_4WD_(
BLEUPacejkaVehicleElectric_4WD_(
BLEUPacejkaVehicleElectric_4WD_(
Powertrains
Utilities
AEBS_Custo
ModelicaServices
PowerTrain
VehicleInterfaces
BLEU
CATIAMultiBody
scene
realExpression
to_kmh
m/s
km/h
4WD
BLEU
world
active
Warn1
gas
Component Browser
CCRs_Model_1
PLMInterface
VehicleDynamics.Vehicles.Experiments.Templates.D
realExpression
to_kmh
timeReachedVelocity
bLEUDashboardComponent
scene
obstacle
interface_Connection2_1
Behavior Tools
View
vehicle/VehicleDynamics.Vehicles.Experiments.Templates.DriverVehicle/CCRs_Model_1 ('Vehicle'.CCRs_Model_1) selected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Search
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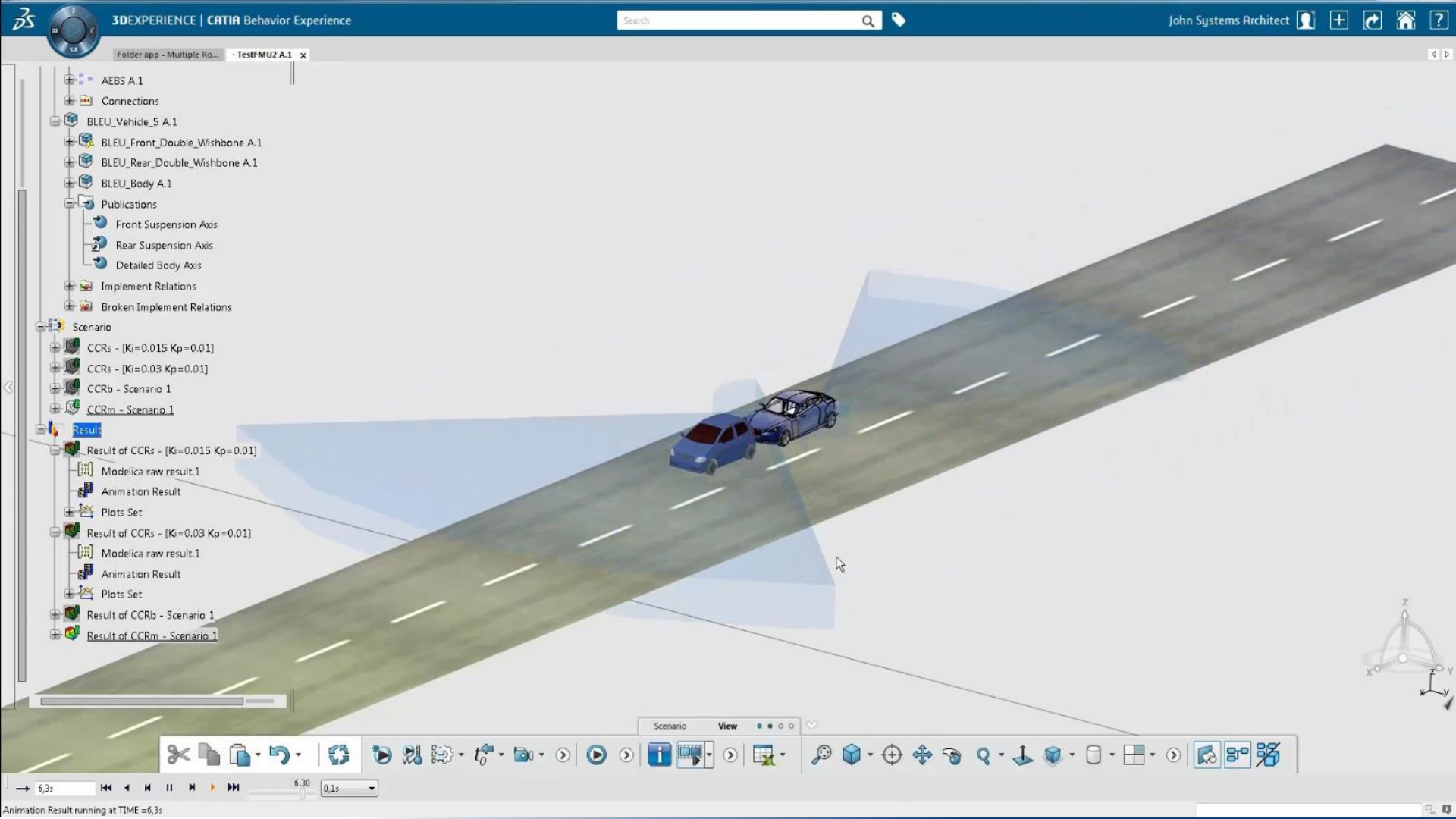
Folder app - Multiple Ro...
- Vehicle Behavior A.1
Package Browser
BLEU_Dynamics.Vehicles.Components.BLEUPacejkaVehicleEle
Drivers
Chassis
Mechanical
Suspensions
Vehicles
Experiments
Components
BLEUPacejkaVehicleElectric_4WD_(
BLEUPacejkaVehicleElectric_4WD_(
BLEUPacejkaVehicleElectric_4WD_(
Powertrains
Utilities
AEBS_Custo
ModelicaServices
PowerTrain
VehicleInterfaces
PowerTrain
VehicleInterfaces
BLEU
CATIAMultiBody
External Controller
4WD
Component Browser
CCRs_Model_1
PLMInterface
VehicleDynamics.Vehicles.Experiments.Templates.D
realExpression
to_kmh
timeReachedVelocity
bLEUDashboardComponent
scene
obstacle
interface_Connection2_1
Behavior Tools
View
chassis/VehicleDynamics.Vehicles.Templates.Car/BLEUPacejkaVehicleElectric_4WD_QS_Active selected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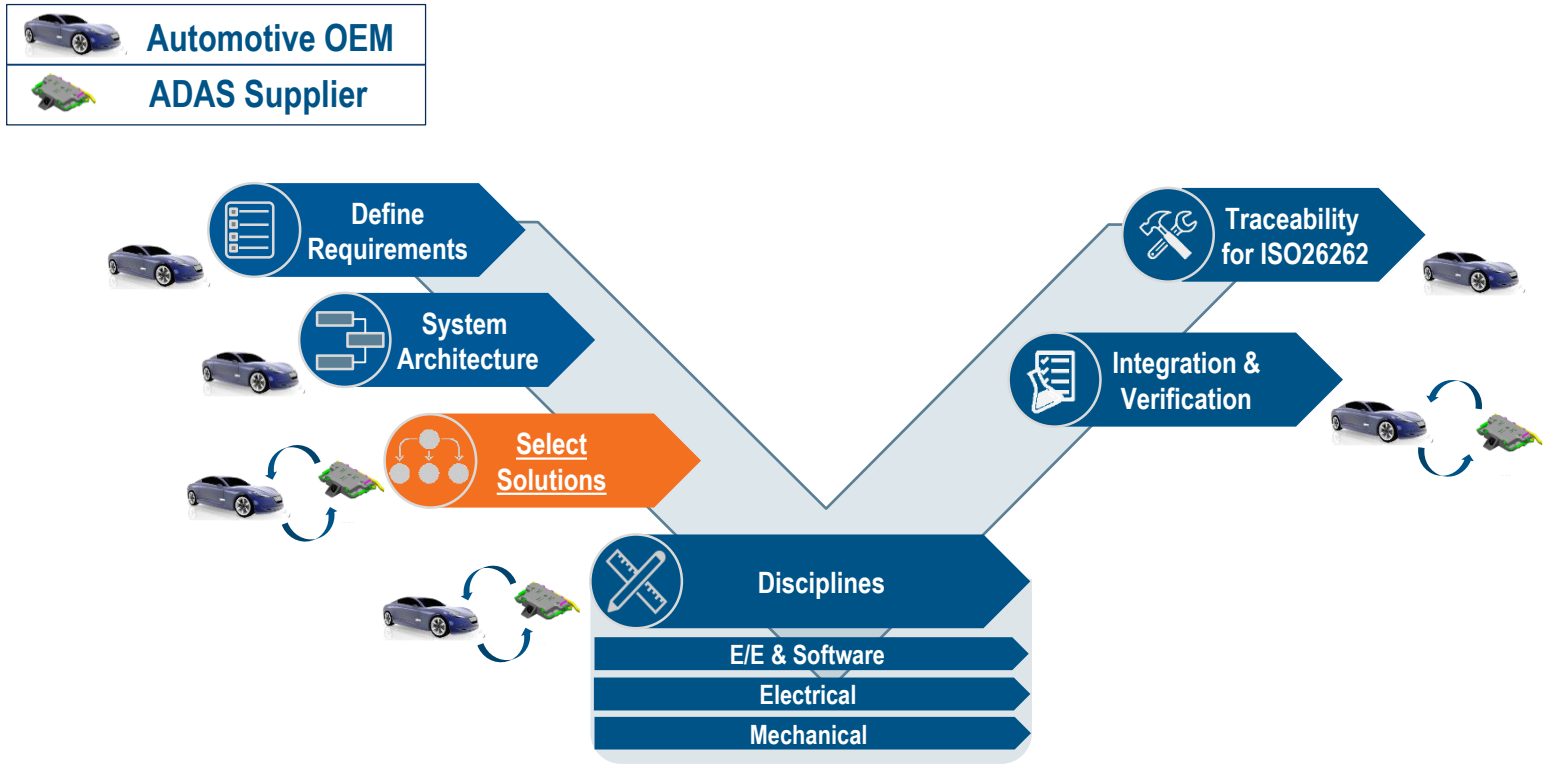
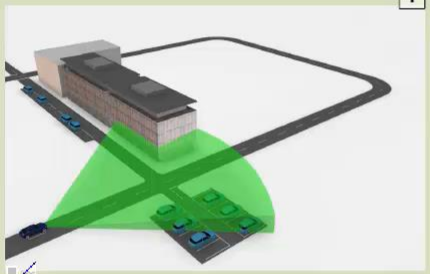
Search
John Systems Architect
Folder app - Multiple Ro...
- TestFMU2 A.1
AEBS A.1
Connections
BLEU_Vehicle_5 A.1
BLEU_Front_Double_Wishbone A.1
BLEU_Rear_Double_Wishbone A.1
BLEU_Body A.1
Publications
Front Suspension Axis
Rear Suspension Axis
Detailed Body Axis
Implement Relations
Broken Implement Relations
Scenario
CCRs - [Ki=0.015 Kp=0.01]
CCRs - [Ki=0.03 Kp=0.01]
CCRb - Scenario 1
CCRm - Scenario 1
Result
Result of CCRs - [Ki=0.015 Kp=0.01]
Modelica raw result.1
Animation Result
Plots Set
Result of CCRs - [Ki=0.03 Kp=0.01]
Modelica raw result.1
Animation Result
Plots Set
Result of CCRb - Scenario 1
Result of CCRm - Scenario 1
Scenario
View
6,3s
6.30
0,1s
Animation Result running at TIME =6,3s

Demonstration Scenario

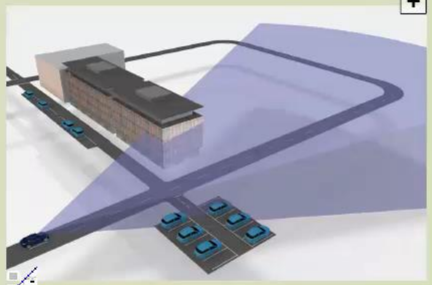


ADAS Alternatives A.1

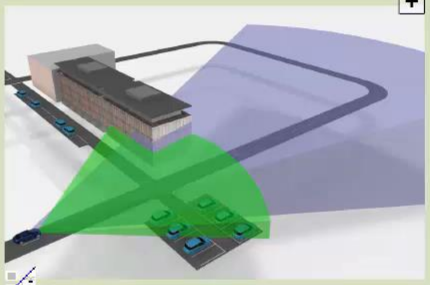
BLEU Radar Sensor A.1

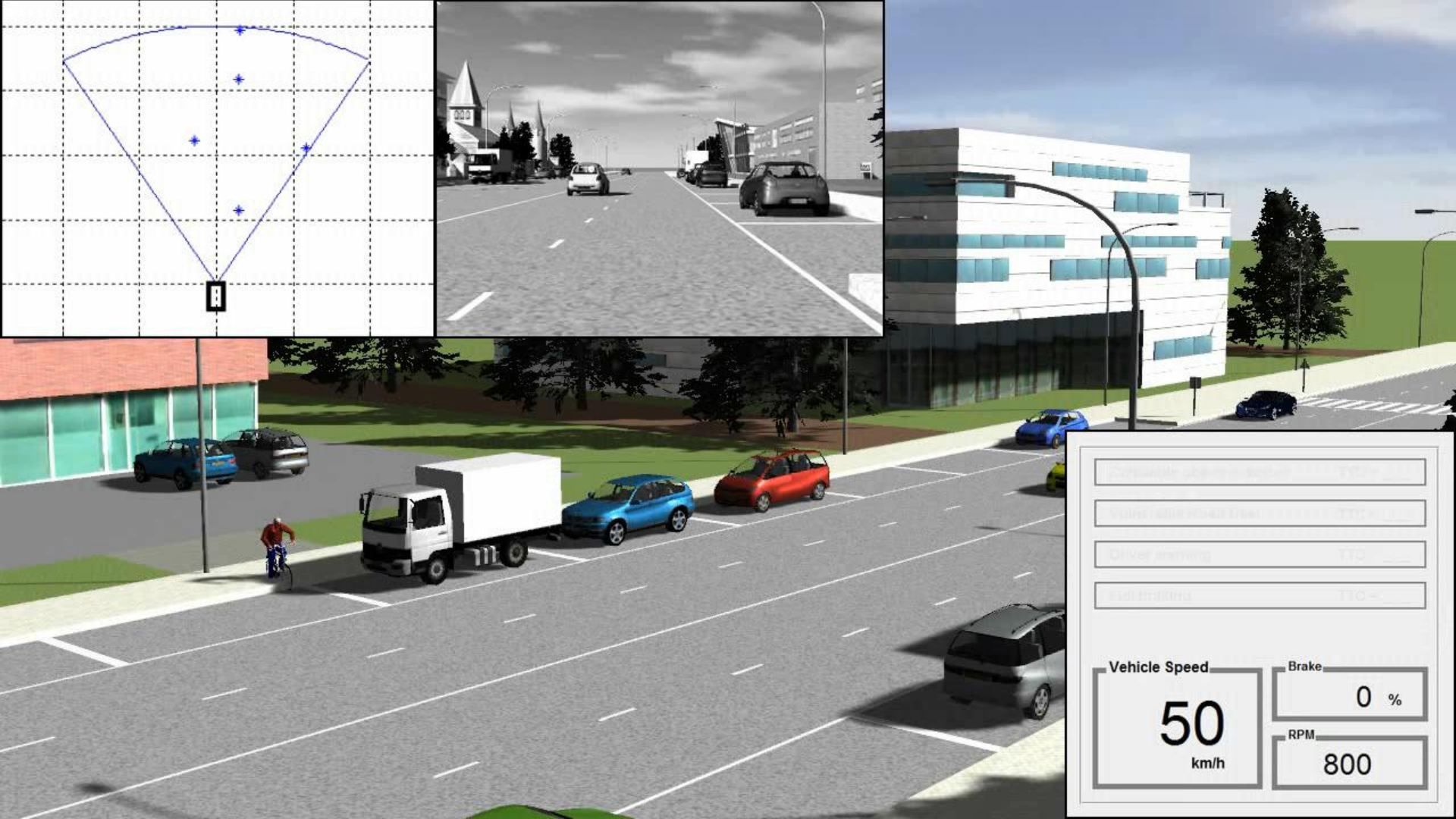


BLEU Camera Sensor A.1

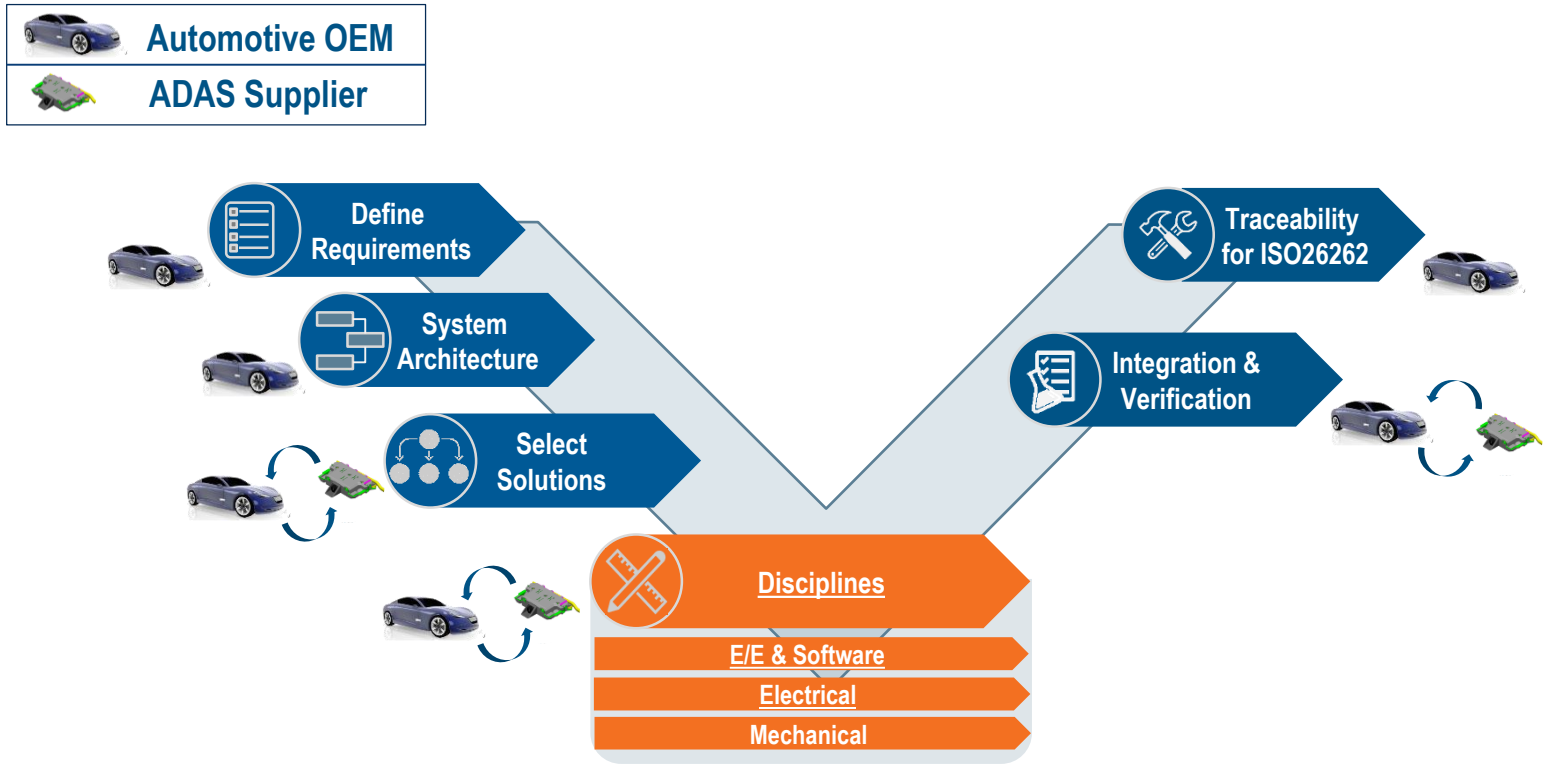


BLEU Camera_Radar Sensors A.1




Vehicle Speed
50
km/h
Brake
0 %
RPM
800

Demonstration Scenario



EEA

File License Management Window Help

*Requir... *Functi... *Hardw... *Comm... *System *Software

- Systems
- System Mappings
  - SysMapping_ABS_ESP A
  - SysMapping_ACC A
  - SysMapping_AEBS A
    - Component Partitionings
      - ABS_ESP A
        - Functions Partitionings
          - Manage Braking Modulation A
          - Manage acceleration request A
          - Measure Vehicle Dynamics Parameters A
        - External Interfaces
          - Chassis CAN: HighSpeedCAN A [CAN]/CAN1
        - Hardware Port Constraints
      - AEBS A
        - Functions Partitionings
          - Calculate the time to collision A
          - Compute additional Braking torque A
          - Manage activation A
            - In
              - Vehicle speed.11[In]: Vehicle speed A
                - CAN1/EBS_CGW_WheelSpeed/Pdu_1/RRWheelSpeed
                - CAN1/CGW_WheelSpeed/Pdu_1/RRWheelSpeed
                - CAN1/EBS_CGW2_20ms/Pdu_1/VehSpd
                - CAN1/CGW_GW2_20ms/Pdu_1/VehSpd
              - Obstacle Detected.2[In]: Obstacle Detected A
              - Obstacle Distance_1.3[In]: Obstacle Distance_1 A
              - Diff_Speed.3[In]: Diff_Speed A
            - Out
        - External Interfaces
        - Hardware Port Constraints

*Used by Properties

AEBS A <EE Component Instance>

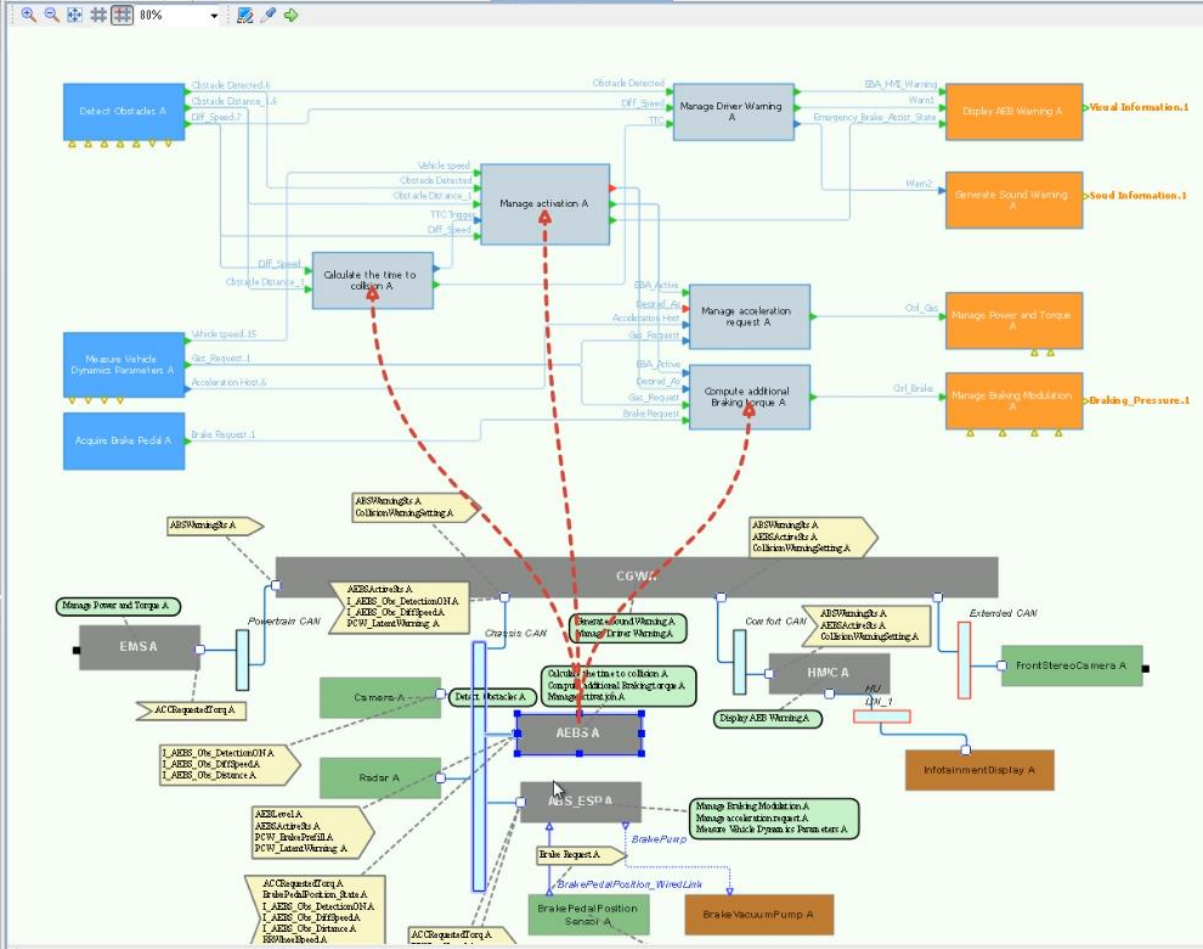
- Parents
- Children
- Implementing Objects
- Implemented Objects
- Connected Objects
- Used by
- Uses

AEBS A <EE Component>

- Children
- Implementing Objects
- Implemented Objects
- Connected Objects
- Used by
- Uses

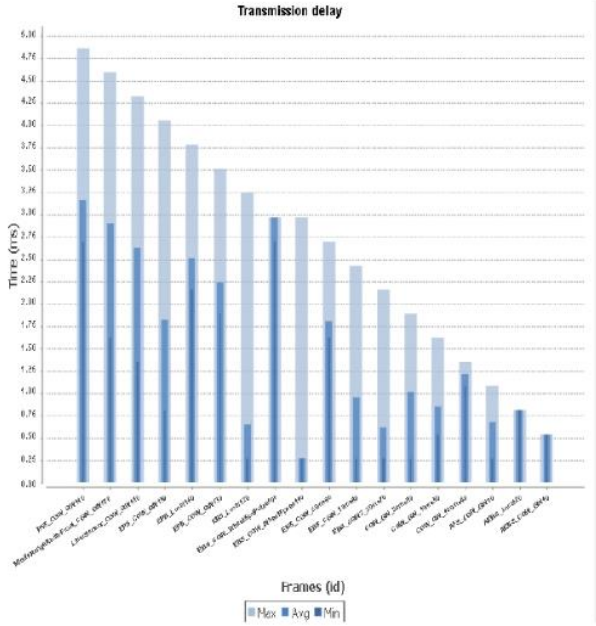
*EEA_Hardware_Topology *AEBS Functional Interactions Chain (Flat View) *SysMapping_AEBS_View

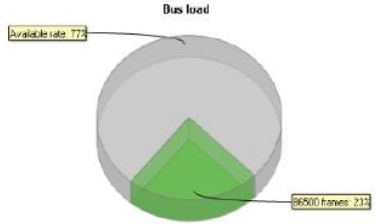
80%

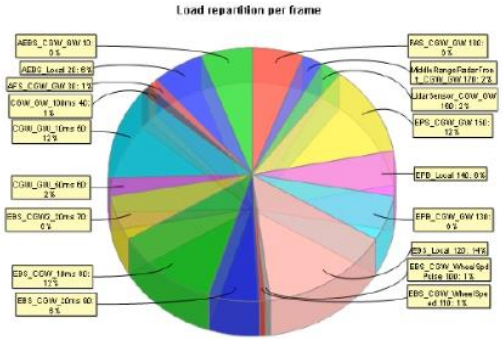


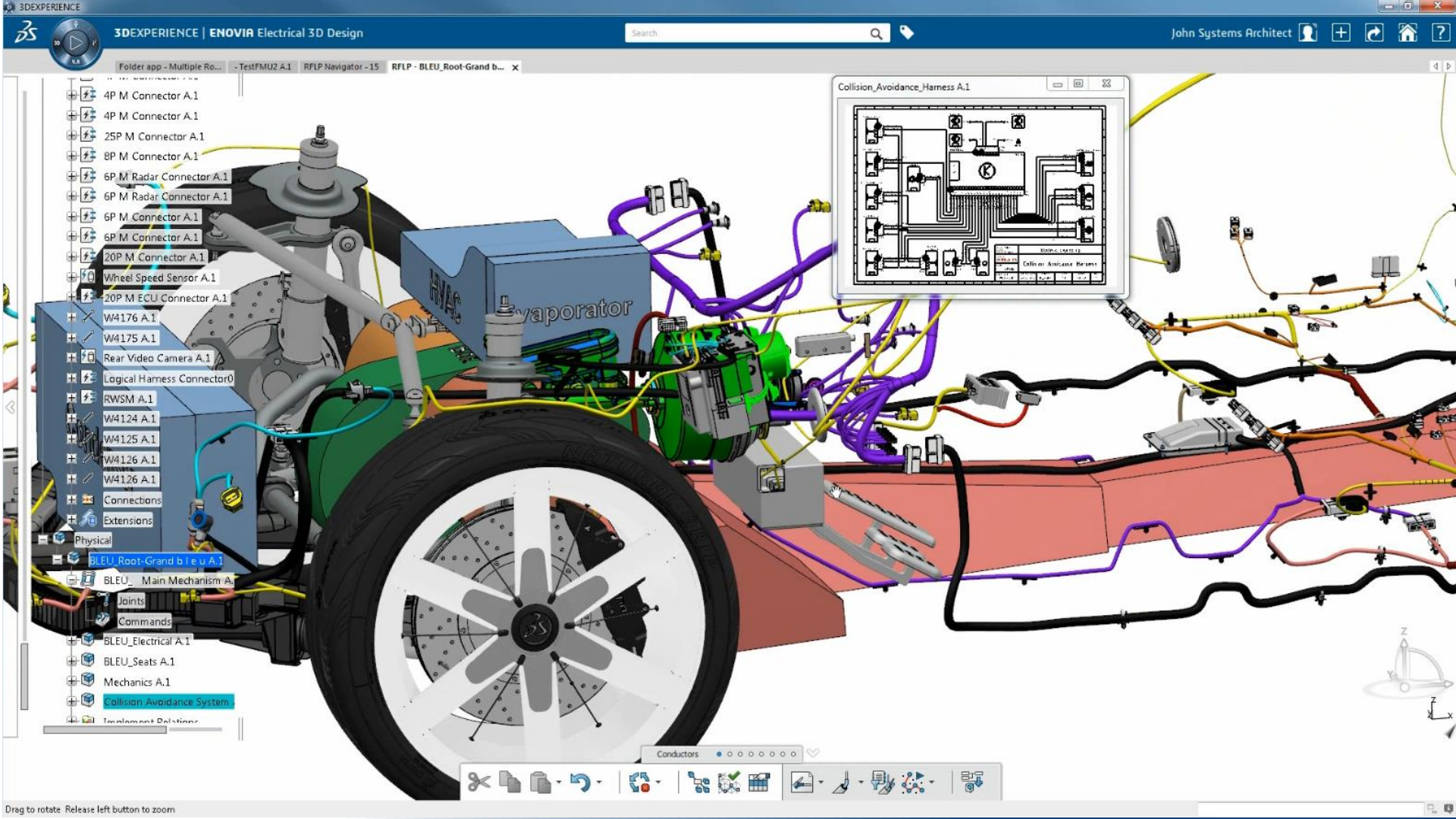
EEECUInstance AEBS A

Bus Load Performances Analysis - Chassis CAN

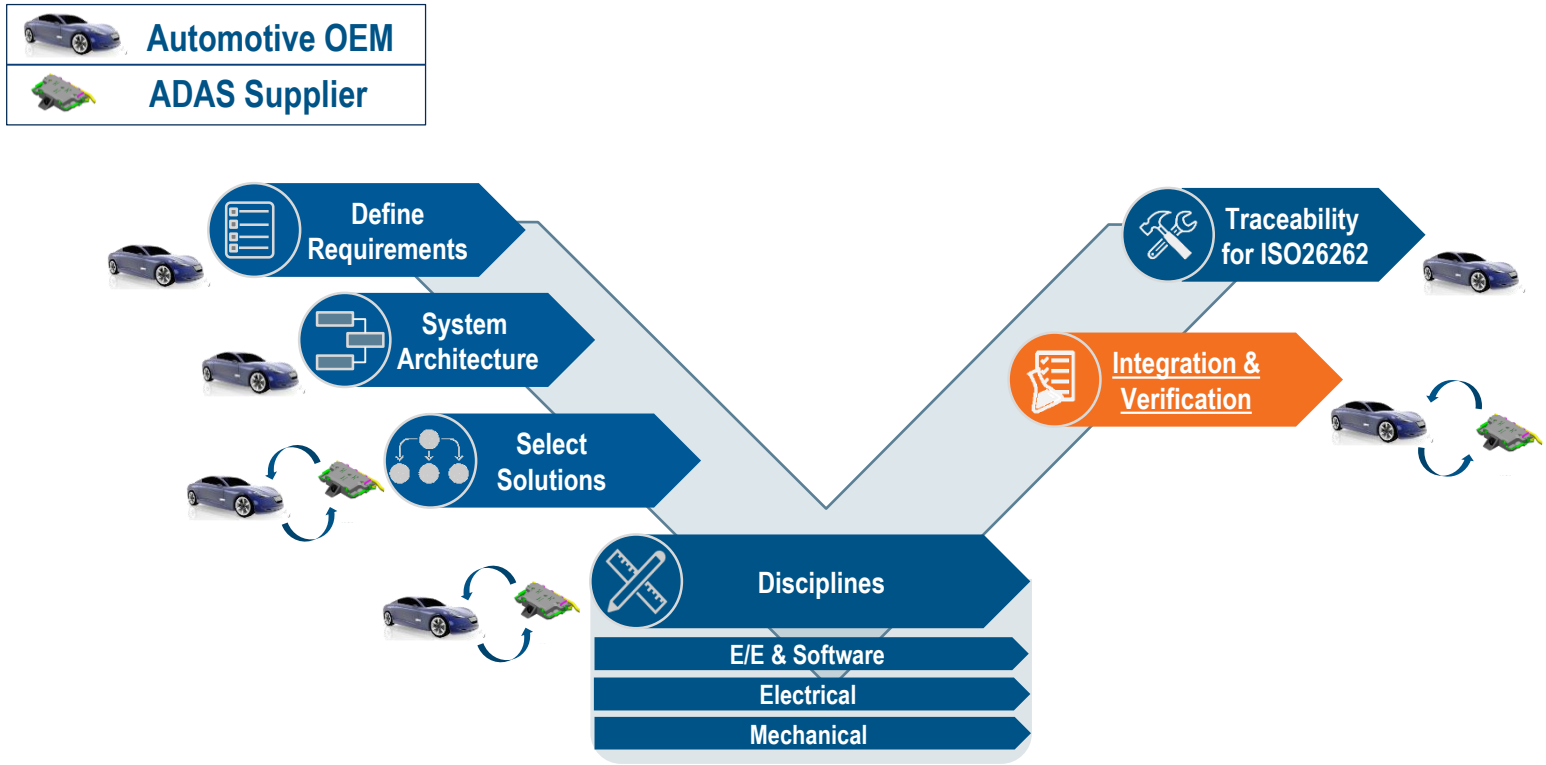







3DEXPERIENCE | ENOVIA Electrical 3D Design
Search
John Systems Architect
Folder app - Multiple Ro...
- TestFMU2 A.1
RFLP Navigator - 15
RFLP - BLEU_Root-Grand b...
4P M Connector A.1
4P M Connector A.1
25P M Connector A.1
8P M Connector A.1
6P M Radar Connector A.1
6P M Radar Connector A.1
6P M Connector A.1
6P M Connector A.1
20P M Connector A.1
Wheel Speed Sensor A.1
20P M ECU Connector A.1
W4176 A.1
W4175 A.1
Rear Video Camera A.1
Logical Harness Connector0
RWSM A.1
W4124 A.1
W4125 A.1
W4126 A.1
W4126 A.1
Connections
Extensions
Physical
BLEU_Root-Grand b l e u A.1
BLEU_ Main Mechanism A.
Joints
Commands
BLEU_Electrical A.1
BLEU_Seats A.1
Mechanics A.1
Collision Avoidance System
Collision_Avoidance_Harness A.1
Conductors
Drag to rotate Release left button to zoom

Demonstration Scenario

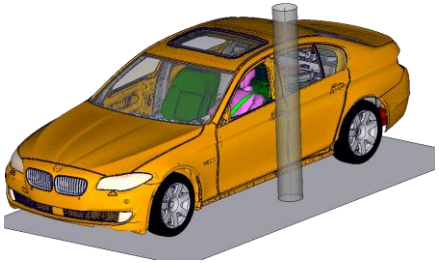


SIMULIA for Verification and Validation

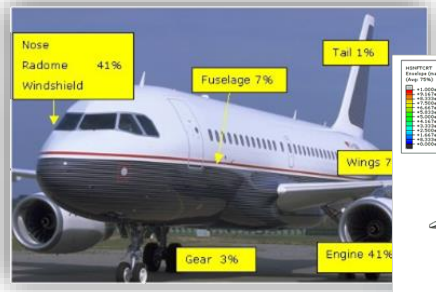
- *"Realistic Simulation" is a simulation that is physically realistic and "life like" in every way*

Courtesy Mechanical Design and Analysis Corporation, 2010 SCC

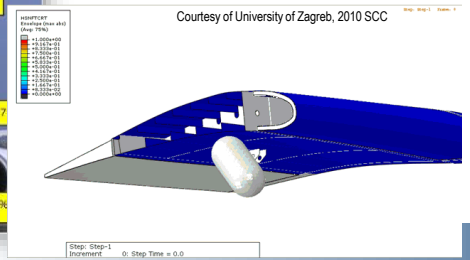
"Predictive Crashworthiness Simulation in a Virtual Design Process without Hardware Testing", Jurgen Lescheticky, Hariaokto Hooputra and Doris Ruckdeschel, BMW Group, SIMULIA Customer Conference, May 2010

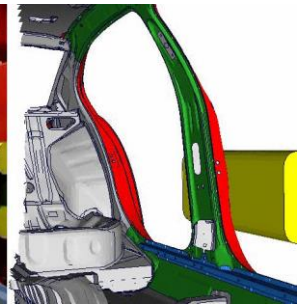


Statistical distribution of impact damage



Courtesy of University of Zagreb, 2010 SCC





Courtesy of BMW Group, 2010 SCC

Collision Avoidance
Service Specifications
Requirement Specifica...

Operational Architecture

State : Private | In Work | Frozen
Owner : FunctionLeader
Modified : 10/6/2016 4:21:10 PM

ADAS Design

- Collision Avoidance 1
- Properties
- Exchange Tracking
- Change Control
- Related objects
- Traceability

Req-Req | Req-Feature | Req-Test Case | Req-Function | Req-Logical | Req-Physical

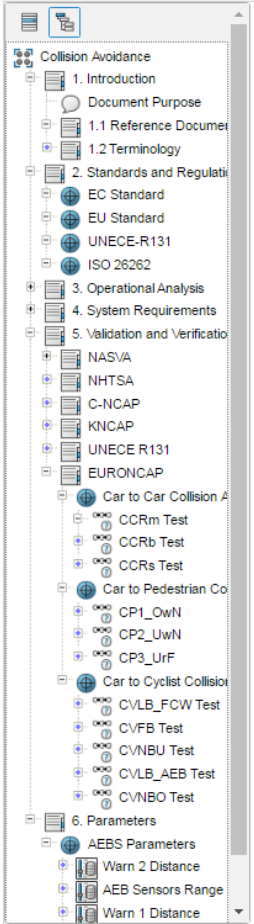
Traceability Report Options

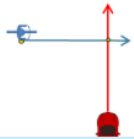
Traceability repo...

Baseline	Baseline				Validation Status		
Name	Title	Revision	Test Case Name	Revision	Owner	Link Status	Notes
Car to Car Collision Avoidance	Car to Car City Collision Avoidance	A	CCRs Test	1	Zoé Function Leader	Not Validated	
Car to Cyclist Collision Avoidanc	Car to Cyclist Collision Avoidance	A	CVLB_FCW Test	1	Zoé Function Leader	Not Validated	
R-0000018	Time to automatically apply the br...	A	TC-0000004	1	Zoé Function Leader	Not Validated	
R-0000019	CCRs Compliance Test	A	CCRs - City - AEB+FCW	1	Zoé Function Leader	Not Validated	
R-0000020	CCRm Compliance Test	A	CCRm - Inter-Urban - AEB Only	1	Zoé Function Leader	Not Validated	
R-0000019	CCRs Compliance Test	A	CCRs - Inter-Urban - AEB+FCW	1	Zoé Function Leader	Validation Failed	
R-0000020	CCRm Compliance Test	A	CCRm - Inter-Urban - AEB+FCW	1	Zoé Function Leader	Validation Failed	
R-0000021	CCRb Compliance Test	A	CCRb - Inter-Urban - AEB+FCW	1	Zoé Function Leader	Validation Failed	
Car to Car Collision Avoidance	Car to Car City Collision Avoidance	A	CCRm Test	1	Zoé Function Leader	Validation Passed	
Car to Car Collision Avoidance	Car to Car City Collision Avoidance	A	CCRb Test	1	Zoé Function Leader	Validation Passed	
Car to Cyclist Collision Avoidanc	Car to Cyclist Collision Avoidance	A	CVNBU Test	1	Zoé Function Leader	Validation Passed	
Car to Cyclist Collision Avoidanc	Car to Cyclist Collision Avoidance	A	CVFB Test	1	Zoé Function Leader	Validation Passed	
Car to Cyclist Collision Avoidanc	Car to Cyclist Collision Avoidance	A	CVLB_AEB Test	1	Zoé Function Leader	Validation Passed	
Car to Cyclist Collision Avoidanc	Car to Cyclist Collision Avoidance	A	CVNBO Test	1	Zoé Function Leader	Validation Passed	
Car to Pedestrian Collision Avoic	Car to Pedestrian Collision Avoida...	A	CP2_UwN	1	Zoé Function Leader	Validation Passed	
Car to Pedestrian Collision Avoic	Car to Pedestrian Collision Avoida...	A	CP1_OwN	1	Zoé Function Leader	Validation Passed	
Car to Pedestrian Collision Avoic	Car to Pedestrian Collision Avoida...	A	CP3_UrF	1	Zoé Function Leader	Validation Passed	
R-0000015	Time to detect collision risk	A	TC-0000001	1	Zoé Function Leader	Validation Passed	
R-0000016	Time to warn the driver	A	TC-0000002	1	Zoé Function Leader	Validation Passed	

Collision Avoidance
Service Specifications
Requirement Specifica...
Operational Architecture

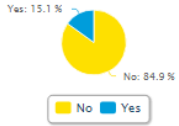
State : Private | In Work | Frozen
Owner : FunctionLeader
Modified : 10/6/2016 4:21:10 PM



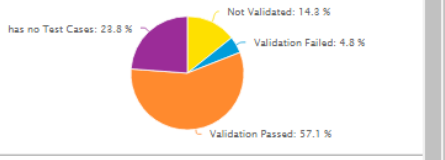
Name	Revision	Title	Content
Car to Pedestrian Co	A	Car to Pedestrian Collision Avoid...	 Avoid a collision with a **pedestrian** in city.
CP1_OwN	1		
CP2_UwN	1		
CP3_UrF	1		
Car to Cyclist Collisi	A	Car to Cyclist Collision Avoidance	 Avoid a collision with a **cyclist** in city or inter-urban area.
CVLB_FCW Test	1	Car-to-Cyclist Longitudinal with F...	 **Car-to-VRU Longitudinal Bicyclist** (CVLB) - with **Forward Collision Warning** (FCW) a collision in which a vehicle travels forwards towards a bicyclist cycling in the same direction in front of the vehicle.
CVFB Test	1	Car-to-Cyclist Farside	 **Car-to-VRU Farside Bicyclist** (CVFB) A collision in which a vehicle travels forwards towards a bicyclist crossing its path cycling from the far-side and the frontal structure of the vehicle strikes the bicyclist at 50% of the vehicle's width when no braking action is applied.
CVNBU Test	1	Car-to-Cyclist Unobstructed	 **Car-to-VRU Nearside Bicyclist Unobstructed** (CVNBU) A collision in which a vehicle travels forwards towards a bicyclist crossing its path cycling from the nearside and

Requirement Specification QuickCharts

- Priority
- Difficulty
- Classification
- Sub Requirements
- Covered Requirements
- Refining Requirements
- State
- Related Changes



- Test Cases
- Parameters
- Requirement Validation



CNBO_HiL-11475770504270
CNBO_HiL
Simulation Process

Hardware in the Loop
Simulation
Car-to-Bicyclist Obstructed

State : Private | In Process | Complete
Owner : gxe
Modified : 10/6/2016 7:15:17 PM

ADAS Design

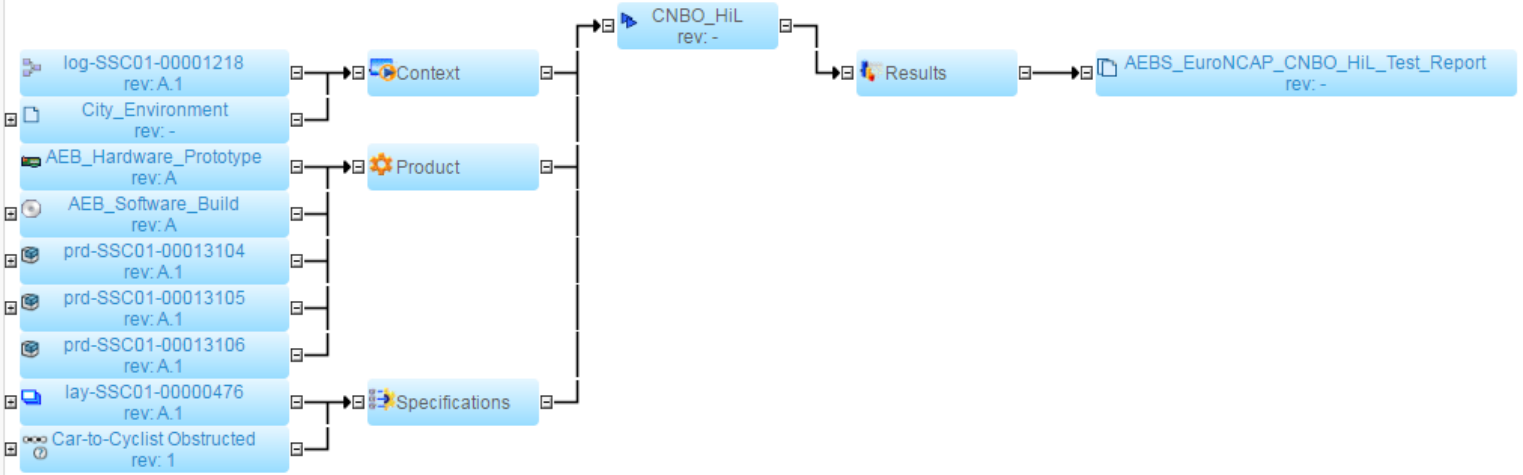
- CNBO_HiL-11475770504270
- Attribute Groups
- Content
- Activities
- Parameters
- History
- Images
- Impact Graph
- Lifecycle
- Revisions
- Routes
- Job Details
- Execution Options
- Summary View
- Multiple Ownership Access
- Process Diagram

Simulation "CNBO_HiL" rev -: Impact Graph

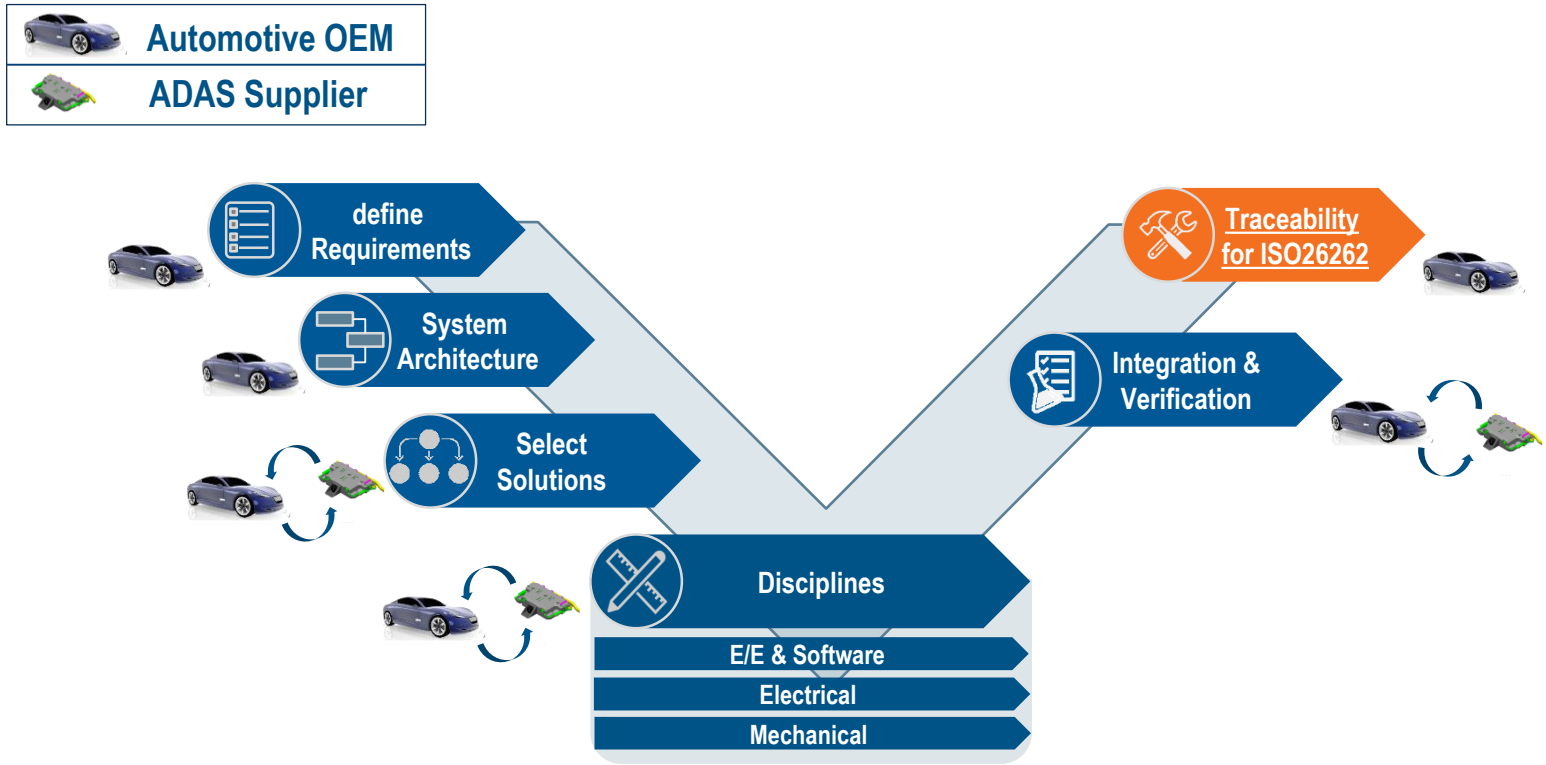
Check Input Rel...

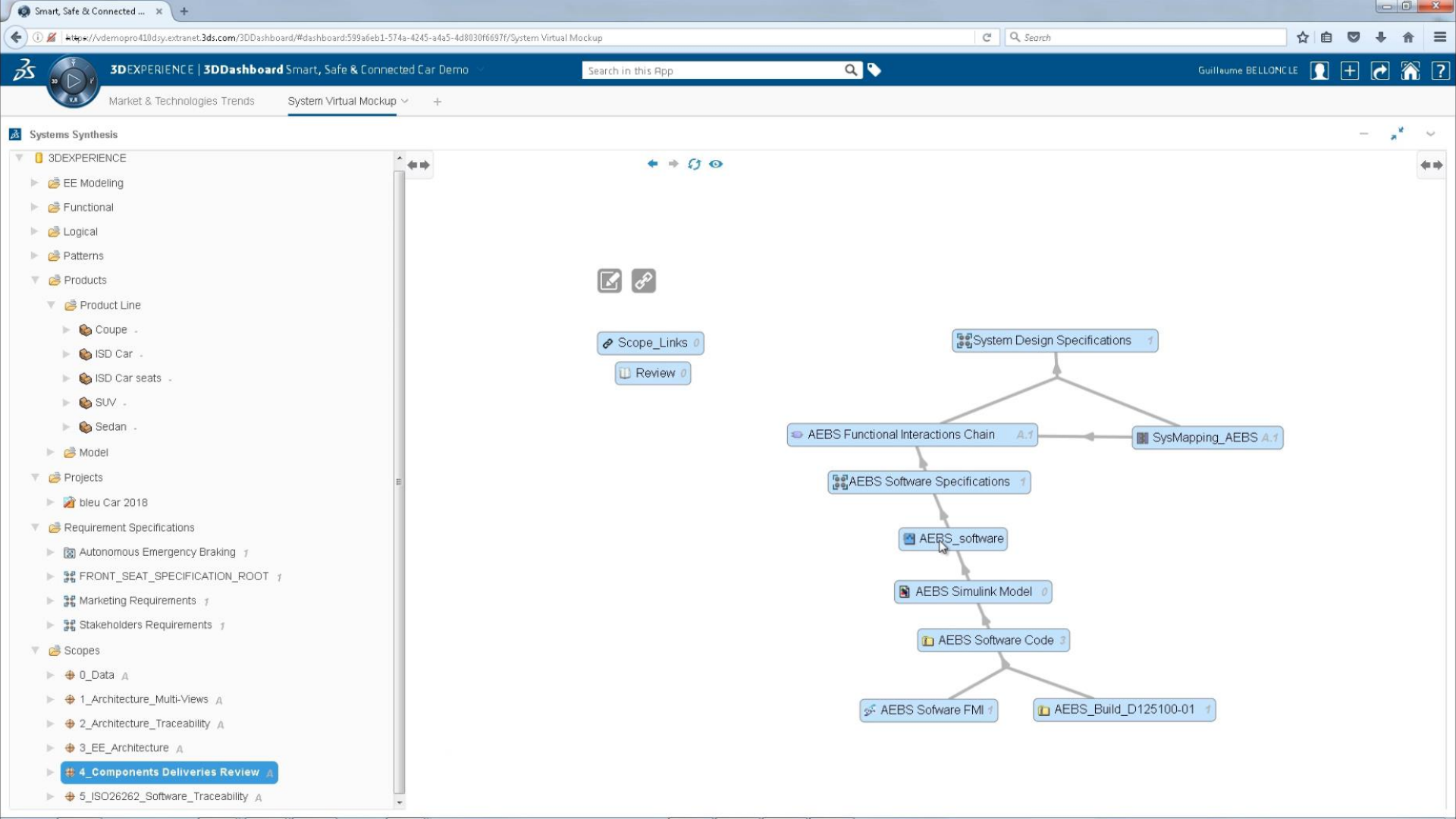
var DisplayErrorMsg = "";

Exclude Category/Folders



Demonstration Scenario

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Requirement Specifications
Autonomous Emergency Braking
FRONT_SEAT_SPECIFICATION_ROOT
Marketing Requirements
Stakeholders Requirements
Scopes
0_Data
1_Architecture_Multi-Views
2_Architecture_Traceability
3_EE_Architecture
4_Components Deliveries Review
5_ISO26262_Software_Traceability
Scope_Links 0
Review 0
System Design Specifications 1
AEBS Functional Interactions Chain A.1
SysMapping_AEBS A.1
AEBS Software Specifications 1
AEBS_software
AEBS Simulink Model 0
AEBS Software Code 3
AEBS Sofware FMI 1
AEBS_Build_D125100-01 1

Customer Testimony

PEUGEOT CITROËN DS AUTOMOBILES

FOR A COMPETITIVE R&D,
ON THE BEST LEVEL OF THE CAR MANUFACTURERS

Engineering Efficiency
1,5 Md€ savings
(2014-2018)

PUSH to PASS

UNDER DEVELOPMENT WITH 3DEXPERIENCE PLATFORM

3 cyl. PureTech Engine - Gen II

New 6-speeds Manual Gearbox

Common Modular Platform

Global-B Program

The PSA Group is Speeding up Its Digital Transition in R&D by Leveraging the 3DEXPERIENCE Platform Developed by Dassault Systèmes

- **The PSA Group is enhancing its ability to manage the complexity of product development and product lifecycles**
- **The R&D efficiency gains are boosting the Group's competitiveness**

September 29, 2016 08:20 AM Eastern Daylight Time

PARIS--(BUSINESS WIRE)--Regulatory News:

"the right data, at the right time, in a high security environment."

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A key efficiency driver that will support the PSA Group's (Paris:UG) Push to Pass strategic plan, the 3DEXPERIENCE platform developed by Dassault Systèmes serves to gather, manage and share all of the information relating to each product throughout its life cycle, from the design and engineering phases right through to after-sales service. The focus remains on customer needs during each of these phases.

The 3DEXPERIENCE platform ensures that development processes run efficiently and that products are modular, reliable, traceable and of high quality. It achieves this by gathering user-shared data and making it accessible at all times around the world.

PSA GROUPE

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from electronic... *to **digitally connected.***

Static

Live

Eliminate silos
with a digital platform

Establish
digital connectivity

Unite all functions
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Dassault Systèmes and No Magic Establish Partnership to Boost Systems Engineering Solutions based on the 3DEXPERIENCE Platform

- **Providing an Integrated Solution for Model Based Systems Engineering (MBSE), ranging from systems of systems, embedded systems modeling and execution to code generation**
- **Adopting and Expanding Industry Standards for "Internet of Experiences"**
- **Aerospace & Defense, Transportation & Mobility, High-Tech, Life Sciences Industries Can Benefit**

Allen, Texas, United States – Paris, France — July 31, 2017 — Dassault Systèmes (Euronext Paris: #13065, DSY.PA) and No Magic, Incorporated have entered into a partnership to join their expertise in the Model-based systems engineering field. The two companies will integrate their industry solutions based on Dassault Systèmes' 3DEXPERIENCE platform addressing, among others, the need for competitiveness in the development of connected and autonomous experiences in the aerospace and defense, transportation and mobility, high-tech and life sciences industries.

Dassault Systèmes and No Magic will jointly collaborate with existing and new leading customers, bringing teams together to transform their business from product innovation to experience innovation, through a smooth introduction of Model Based Systems Engineering, starting from upstream thinking, design and simulation, to production and operations.

Today's Internet of Things (IoT) has evolved into the "Internet of Experiences" where autonomous products

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