dSPACE a MBD

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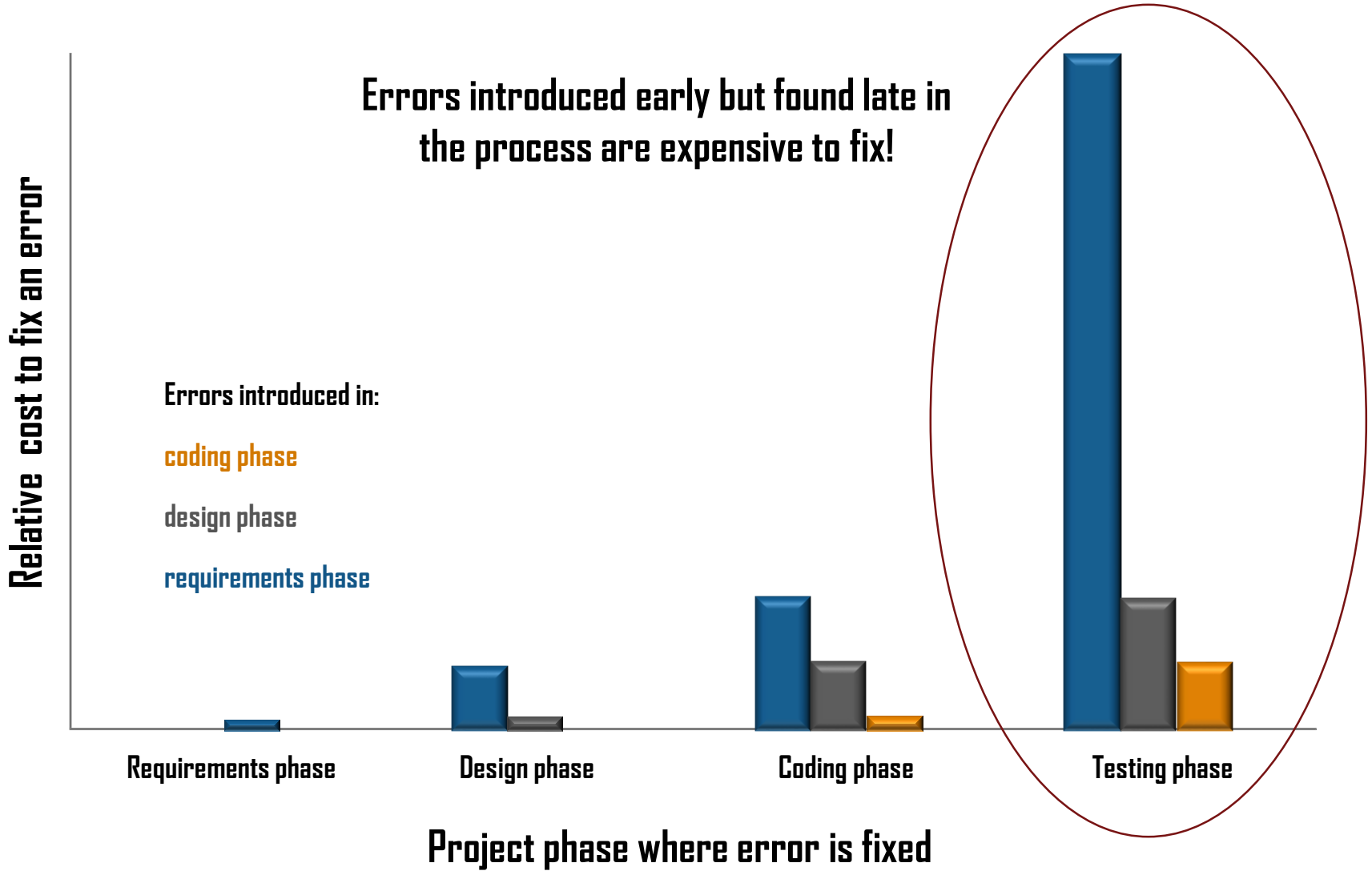
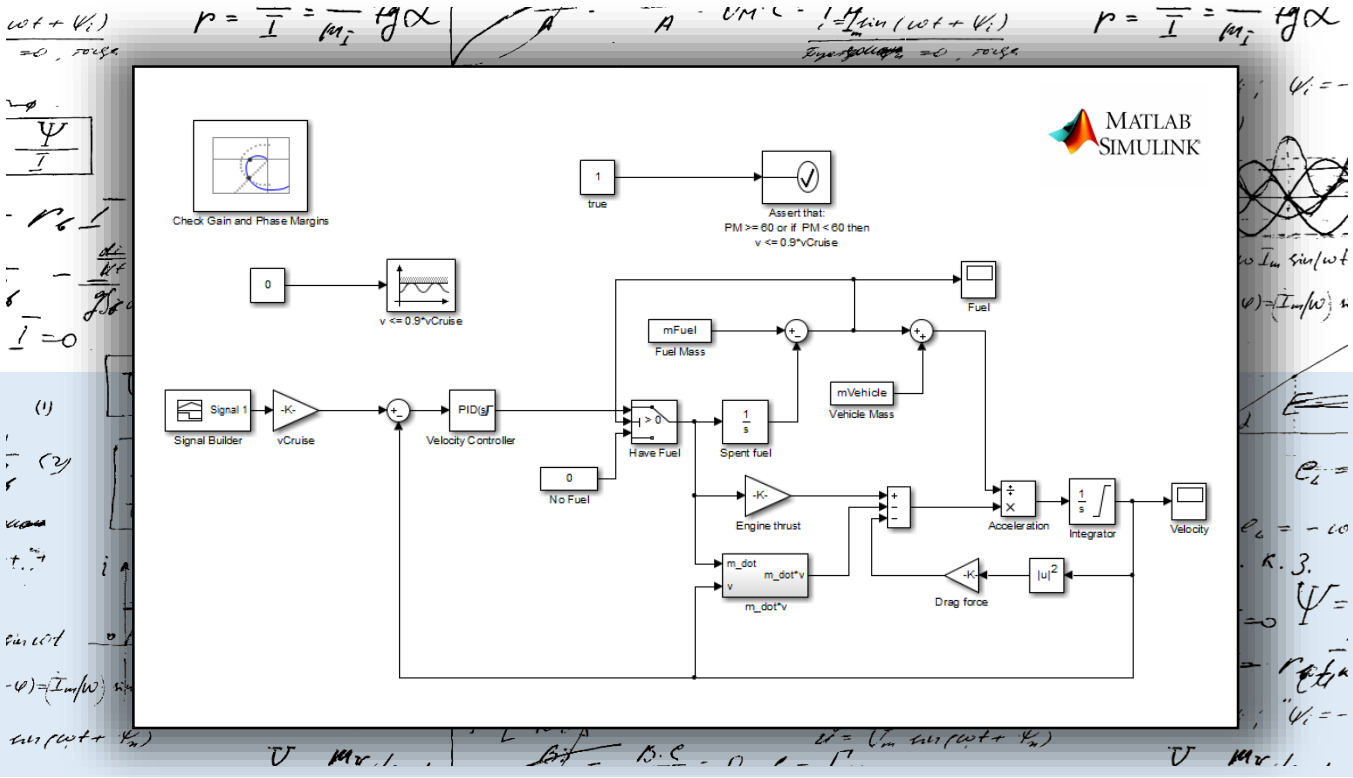
HUMUSOFT®

KOĽKO STOJÍ CHYBA?



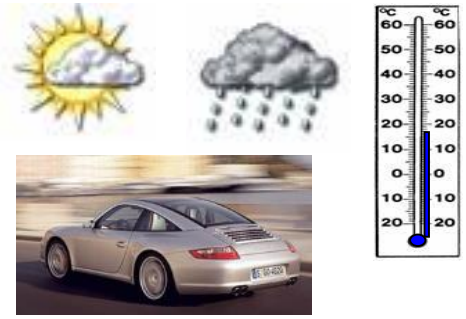
Source: Return on Investment for Independent Verification & Validation, NASA, 2004.

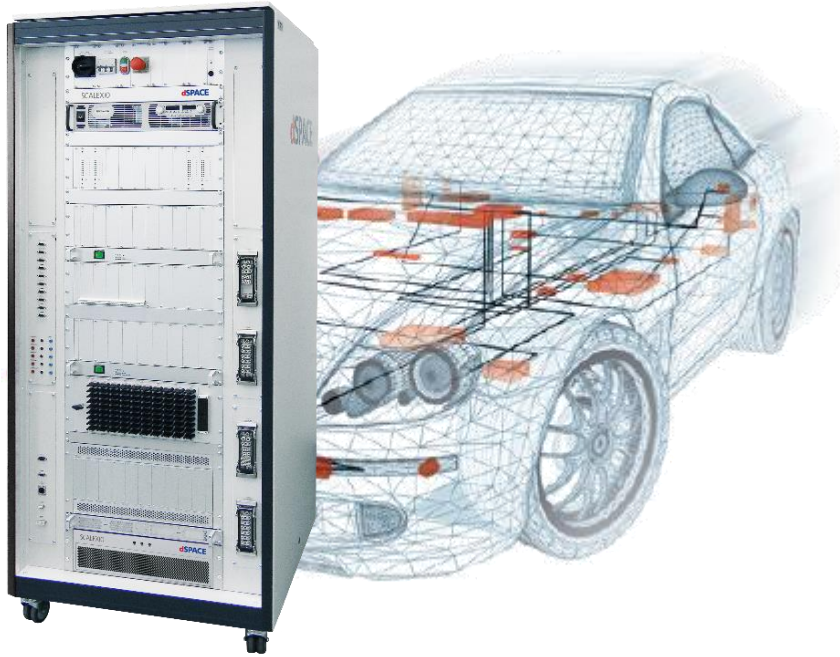


Model je spustiteľná špecifikácia. Matematický opis, ktorý dáva inžinierom rôzne pohľady na správanie systému. Vytvorenie modelu vyžaduje niekoľko krokov ako sú identifikácia systému, modelovanie rovnicami, vytvorenie diagramu a pod. Následne môže byť model využitý na generovanie kódy a testovacie scenáre MIL, SIL, PIL, HIL...

HARDWARE-IN-THE LOOP

ECU si myslí, že naozaj jazdí





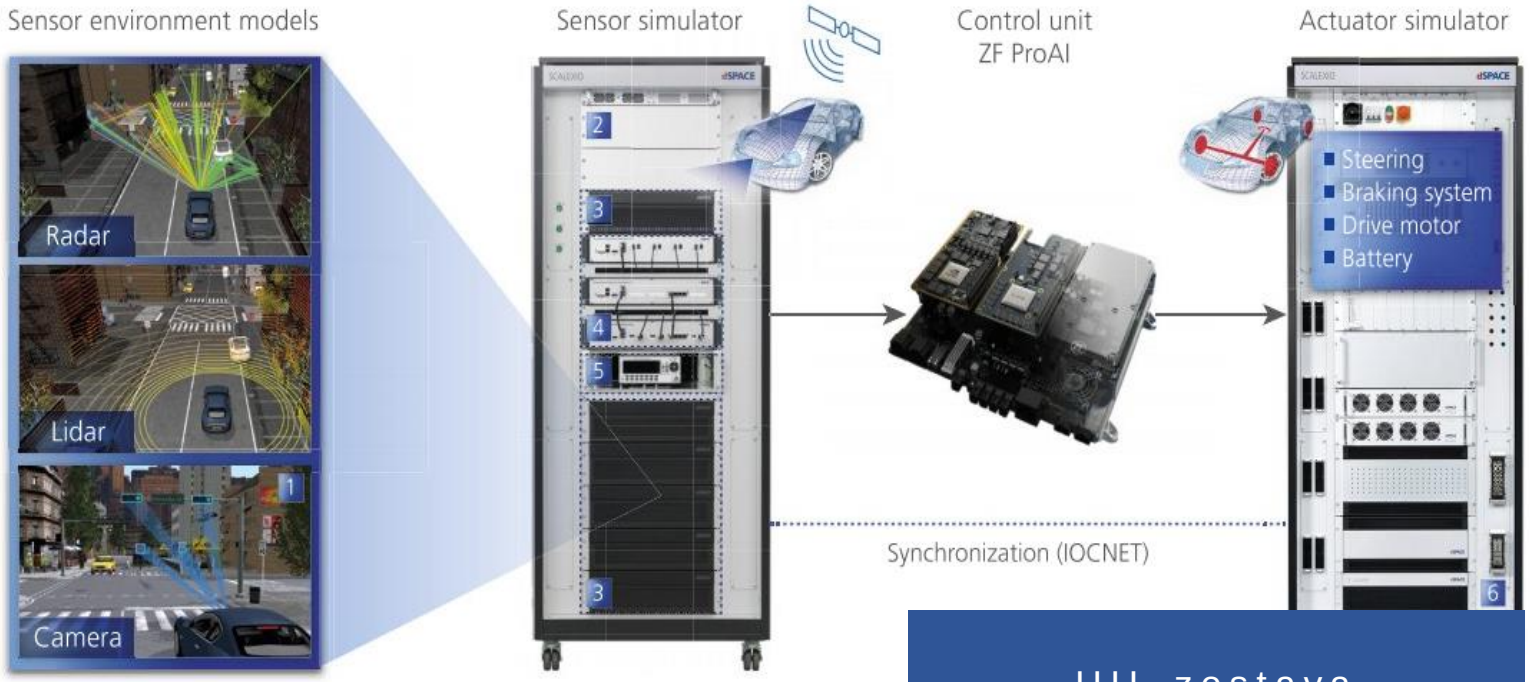
Embedded Success dSPACE

AI

IN-THE-LOOP

REALISTICKÁ SIMULÁCIA SENZOROV

"We rely on the powerful dSPACE tool chain to validate the AI-based control unit of our autonomous technology platform as early as possible and in combination with the sensors and actuators." Oliver Maschmann, ZF



HIL zostava

ROZŠÍRENÁ REALITA

VEHICLE-IN-THE-LOOP

" We take the vehicle-in-the-loop (VIL) approach when validating ADAS/AD functions because it gives us the combined advantages of real and virtual test drives. The robust real-time system from dSPACE enables us to implement this test method in the vehicle and achieve results that are extremely precise and realistic."

Teaseung Kim, Hyundai MOBIS

VIRTUÁLNA REALITA

Senzory zachytávajú informácie z virtuálneho sveta...

SKUTOČNÝ SVET

... a použijú ich na ovládanie reálneho vozidla.

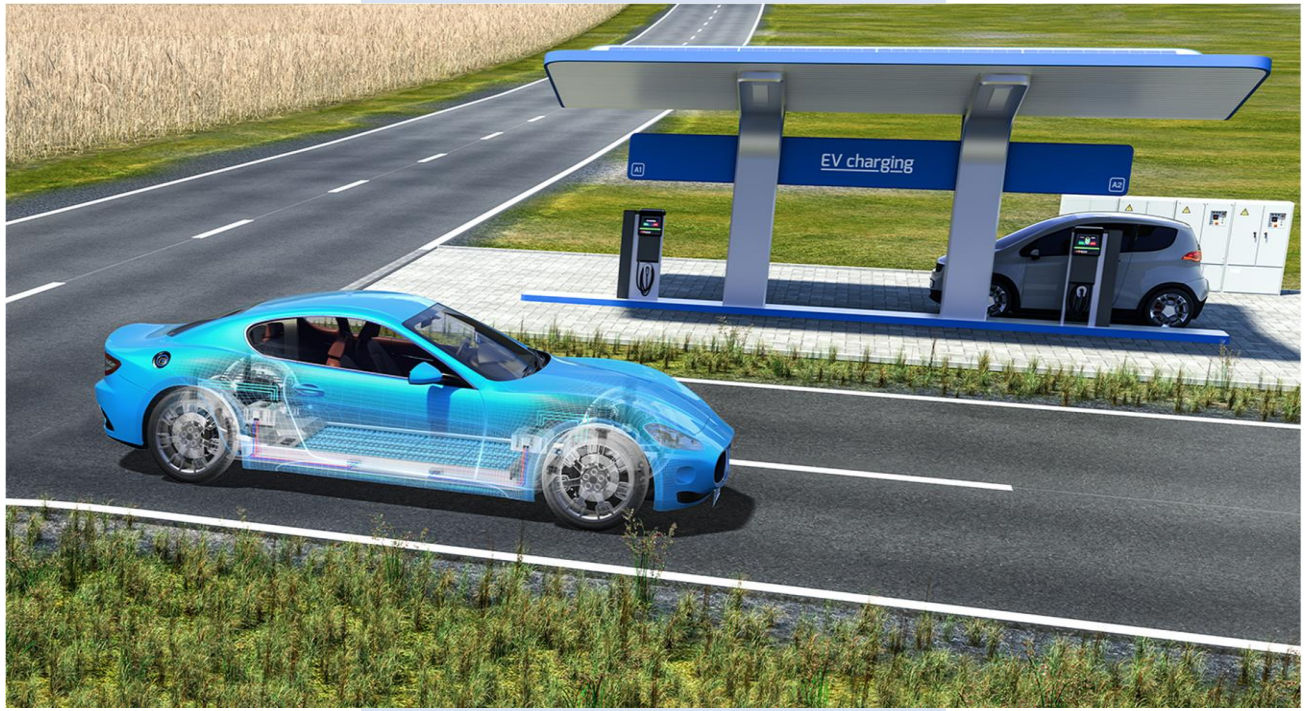
MODULÁRNY RT SYSTÉM DO VOZIDIEL

SCALEXIO

AutoBox

ELEKTROMOBILITA

KOMPLETNÝ VÝVOJ A TESTOVANIE



- VÝVOJ
- SIMULÁCIA
- AUTO CODING
- TESTOVANIE

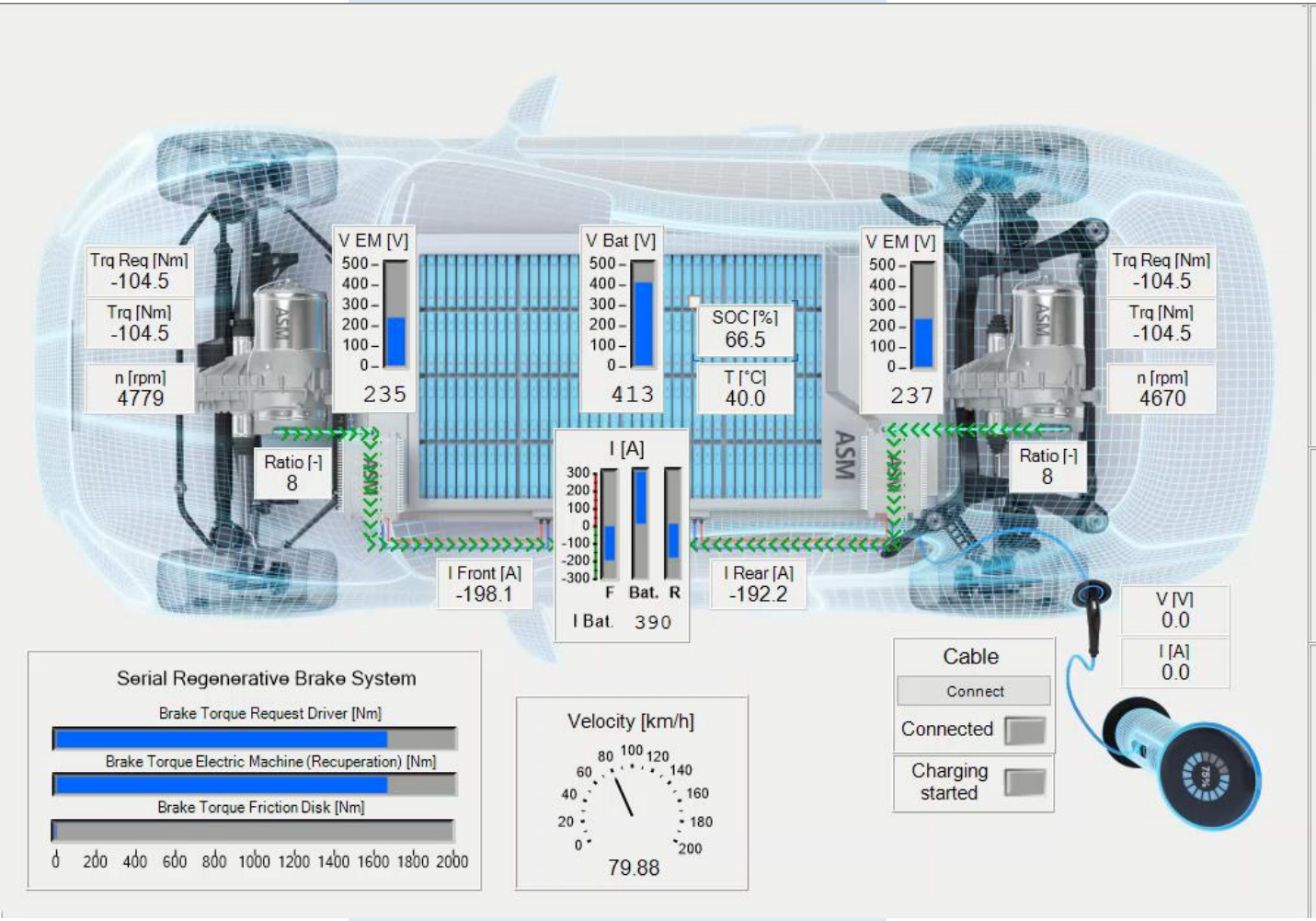
CONCEPT_ONE

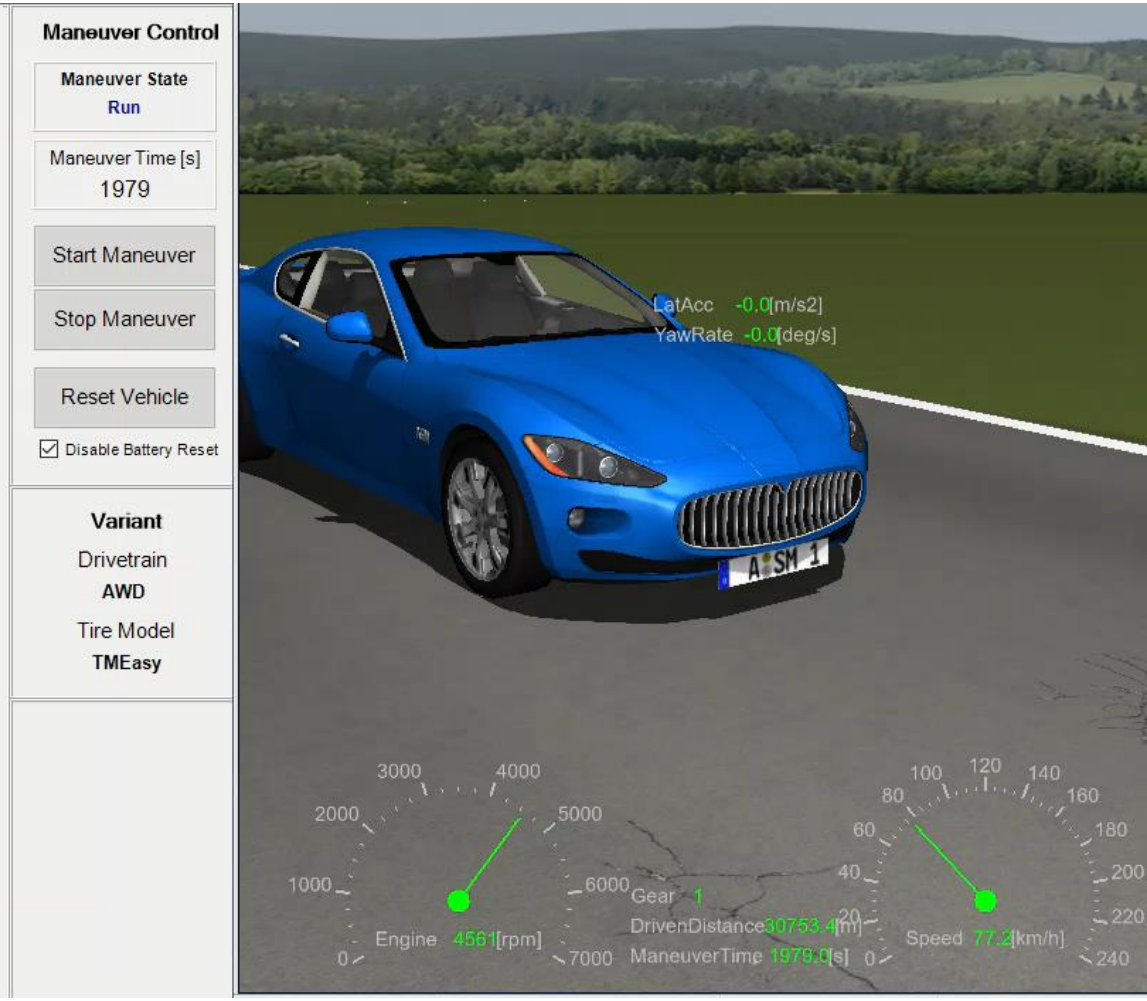
1088hp 325km/h 0-100 za 2.8s

"" Working with the MicroAutoBox is simple and straightforward, allowing control engineers to focus on controller development without worrying about the underlying code."

Tomislav Šimunić, head of the vehicle dynamics team, Rimac Automobili

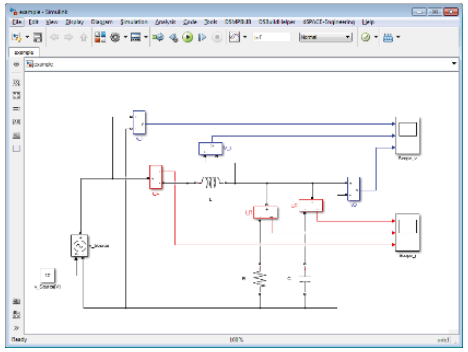
SIMULÁCIA


Trq Req [Nm]
-104.5
Trq [Nm]
-104.5
n [rpm]
4779
V EM [V]
235
Ratio [-]
8
V Bat [V]
413
SOC [%]
66.5
T [°C]
40.0
I [A]
F Bat. R
I Bat. 390
I Front [A]
-198.1
I Rear [A]
-192.2
V EM [V]
237
Ratio [-]
8
Trq Req [Nm]
-104.5
Trq [Nm]
-104.5
n [rpm]
4670
ASM
Serial Regenerative Brake System
Brake Torque Request Driver [Nm]
Brake Torque Electric Machine (Recuperation) [Nm]
Brake Torque Friction Disk [Nm]
0 200 400 600 800 1000 1200 1400 1600 1800 2000
Velocity [km/h]
79.88
Cable
Connect
Connected
Charging started
V [V]
0.0
I [A]
0.0

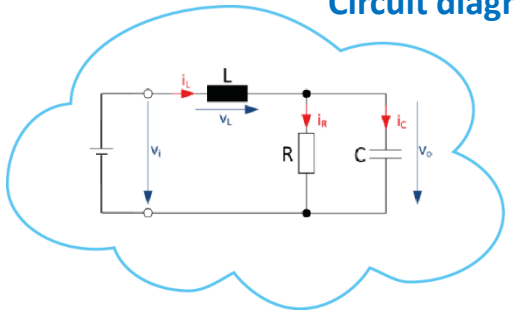

Maneuver Control
Maneuver State
Run
Maneuver Time [s]
1979
Start Maneuver
Stop Maneuver
Reset Vehicle
Disable Battery Reset
Variant
Drivetrain
AWD
Tire Model
TMEasy
LatAcc -0.0[m/s2]
YawRate -0.0[deg/s]
Engine 4561[rpm]
Gear 1
DrivenDistance30753.4[m]
ManeuverTime 1979.0[s]
Speed 77.2[km/h]

Electrical Power Systems Simulation (EPSS) Package

SimPowerSystems™ model

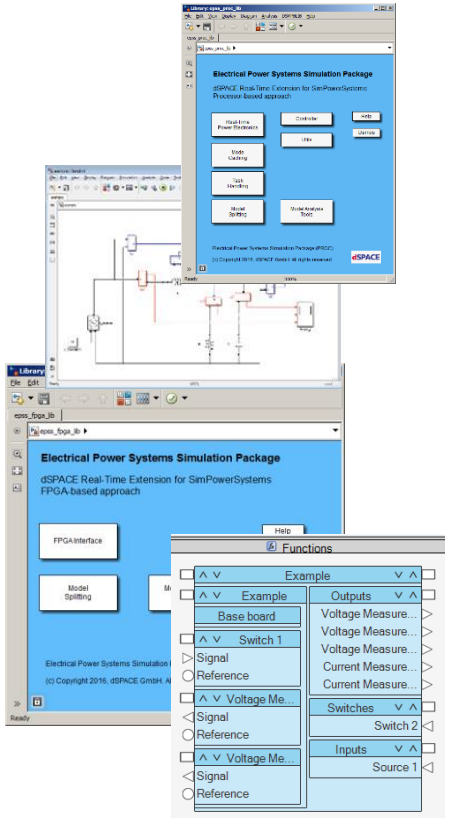


Circuit diagram

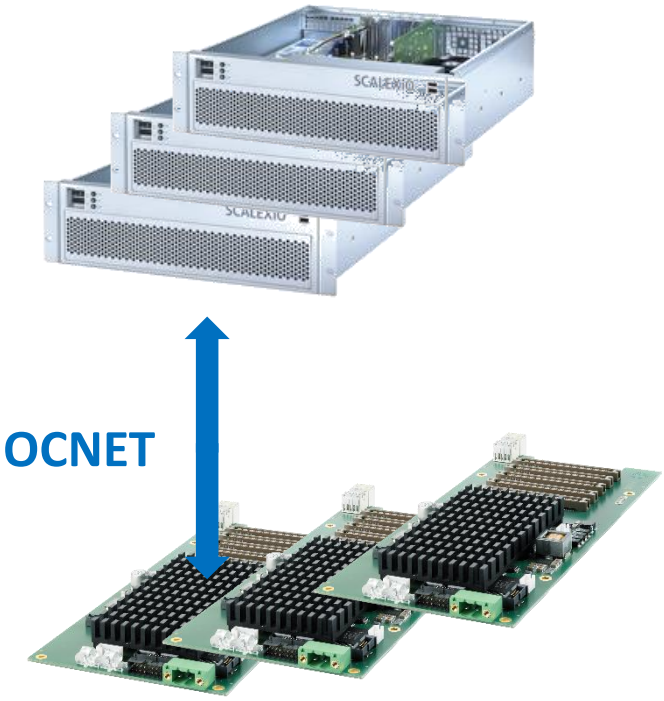


Processor
~25µs

FPGA
~2.5µs



IOCNET



FPGA BASE BOARDS

DS6601 / DS6602

Vysokovýkonné FPGA karty vybavené najnovšou FPGA technológiou pre splnenie najprísnejších požiadaviek v širokom rozsahu aplikácií ako sú elektrické pohony, hybridné vozidlá, výkonová elektronika.

Užívateľom programovateľné FPGA

Embedded Success

VÝVOJ A TESTOVANIE MECHATRONICKÝCH SYSTÉMOV

ĎAKUJEM

TCC 2019

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