Test drive your ADAS algorithms:

From desktop to real-time

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MathWorks Automotive Conference
12th May 2016
Introduction

MATLAB & Simulink are extensively used in automotive safety system development

ADAS introduce new engineering challenges

- Vision algorithm design
- Radar signal processing
- Sensor fusion
- Analyzing huge data
- Ground truth labeling
- Rapid re-simulation
- Environmental modeling
- Photo realistic display
...
MathWorks has Invested Heavily To Support ADAS Development

- Sensor Data Streaming
- Vision Algorithm Design
- Camera Calibration
- RADAR Signal Processing
- RADAR System Modeling
- Large Scale Modeling
- Point Cloud Processing
- Model Predictive Control
- Simulation Integration
- ROS Interface
- Machine Learning
- Deep Learning
- Rapid Prototyping
- C and HDL Code Generation
- Gaming Engine Interface
MATLAB and Simulink Help Engineers Put ADAS and Autonomous Driving on the Road
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Sensor fusion

50 km/h - sudden brake
Test drive your ADAS algorithms

- Architect AEB algorithm in Simulink.
- Test drive the virtual car on the virtual track.
- Automate the testing and generate distributable test report.
Develop FCW algorithm and test against logged vehicle data
Develop AEB algorithm and test with event driven stimulus

Algorithm Models

Forward Collision Warning

Autonomous Emergency Braking

Vehicle and Environment Models
Develop AEB algorithm and test with event driven stimulus

Stopping Distance Calculations

State Logic
What next after open loop testing?

Algorithm Models

- Forward Collision Warning
- Autonomous Emergency Braking

Vehicle and Environment Models
Ego Vehicle Dynamics

Coordinate Transforms

Target Vehicle Dynamics

Sensor Models
Integrate algorithms and test with closed-loop simulation

Algorithm Models

Forward Collision Warning

Autonomous Emergency Braking

Vehicle and Environment Models
Real-Time Testing with Simulink Real-Time

Algorithm Models

- Forward Collision Warning
- Autonomous Emergency Braking

Vehicle and Environment Models

CAN Cable
Calibration and Rapid Prototyping with Speedgoat
Test Automation with Simulink Test
Run the realtime test cases in the test manager

% In the SL Test Manager window:
% 1) Click Open Test File
% 2) Select the Test file: AEB_testng_scenarios_SLRT.mldata
% 3) Click Run to run all the test cases
% Clear all the files in the
slice.testmanager.clear
pause(0.5);

% Open the AEB_testng_scenarios_SLRT.mldata file
slice.testmanager.load('AEB_testng_scenarios_SLRT.mldata');
slice.testmanager.verbosity;
pause(0.5);

% Run the test file
slice.testmanager.run;

% Once the test gets done, analyse the test data and automatically generate the test report.
pause(5);
disp('Test Complete. Generating Test Report');
run('task_AnalysisAndReport.m');
Test drive your ADAS algorithms

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- Test drive the virtual car on the virtual track.

- Automate the testing and generate distributable test report.
Thank you