INTERACTIVE TESTING OF AUTOMOTIVE FUNCTIONS

UCAAT 2014
SOFTWARE IN THE CAR. INNOVATION.
SOFTWARE IN THE CAR.

CHALLENGES.

- In-vehicle software becoming more and more important.
- Rapid cycles in hardware technology.
- Increasing connectivity.
- Rising consumption of electricity.
- Ensure product quality.
SOFTWARE IN THE CAR.

BMW 7 SERIES.

7 series wiring harness

- No. of electric pins: 3490
- Total length of wiring: 2751 m
- No. of electric plugs: 570
- Wiring channels: 16
- Total weight: 43 kg

On-board network

- ECUs: 35 ... 70
- CPUs: ca. 180
- GPUs: > 5
- Buses: CAN, LIN, MOST, FlexRay, Ethernet

Miscellaneous

- Software: ca. 1 GB
- Operating systems: Standard Core AUTOSAR GENIVI
SOFTWARE BUILDING BLOCKS. AUTOSAR.

– Standard Basic Software.

– Software Components as hardware-independent building blocks.

– Standard description format for interfaces (sender/receiver, client/server) and lifecycle events.

– Well-defined SW-C communication via generated RTE.
BUILDING BLOCKS.
SOFTWARE LIBRARIES FOR PRODUCT FAMILIES.

- Cruise Control.
- Traffic Jam Assistant.
- Speed Limit Info.
- Lane Departure Warning.

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- Power Windows.
- Light: Xenon, LED, Laser.
- Wiper.
- Comfort Access.

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QUALITY.

- Continuous Integration.
- Continuous Quality Control.
- Static Code Analysis.
- Resource Tracking.
- Code Coverage.
- Requirement Coverage.
- Code Reviews.
SWC TESTS. TESTING AGAINST REQUIREMENTS ON THE PC.

TCF Tests (Regression)  TCF to C++ translation layer

Requirements System level: „button“, „display“, „actor“.

Requirements SWC level: „I/O signal“, „timing“, „bits“.
SWC TESTS.
DRIVING THE SWC ON THE PC.

Requirements System level: „button“, „display“, „actor“.
Requirements SWC level: „I/O signal“, „timing“, „bits“.
THE GUI. YOU GET THE IDEA.

– Provides user controls and in-car displays.
– Simulates missing partners: other SWCs and required Basic SW.
– Provides fine-grain lifecycle control, error injection.

– Early demonstration/validation.
– Experience functions before in-car tests are possible.
– Execute high-level test scenarios.
– No hardware required.
THANK YOU.
QUESTIONS...