UVM-SystemC based hardware in the loop simulations for accelerated Co-Verification

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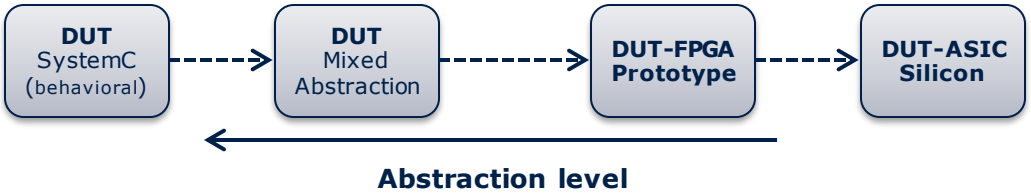
Agenda

1. Introduction
   - Overview
   - Aims
2. Methodology
3. Case Study Airbag SOC
4. Summary

Introduction: Overview

- DUT evolvement

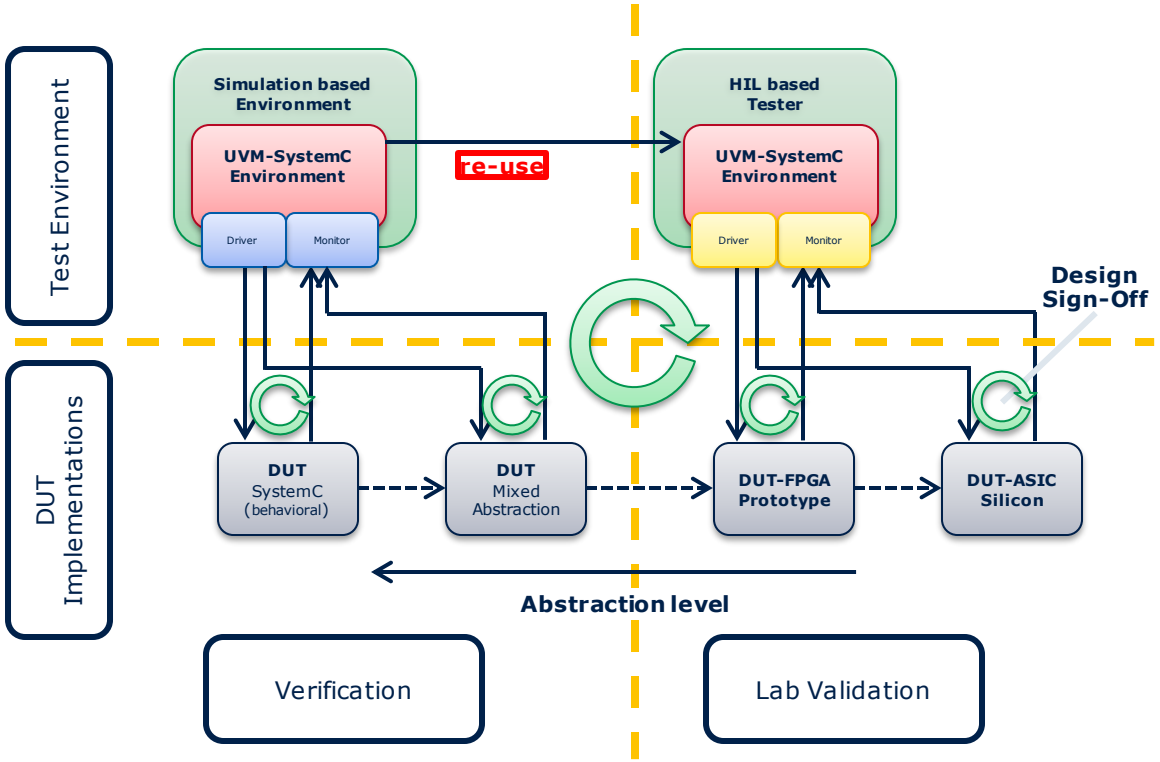


- Lab Verification and Lab Validation

- Test Environments

Introduction: Aims

- Increase interchangeability of test description
- Integration of a HIL into Verification



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   - Lab Validation with UVM-SystemC
   - Advantages
   - Tooling
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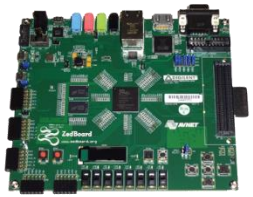
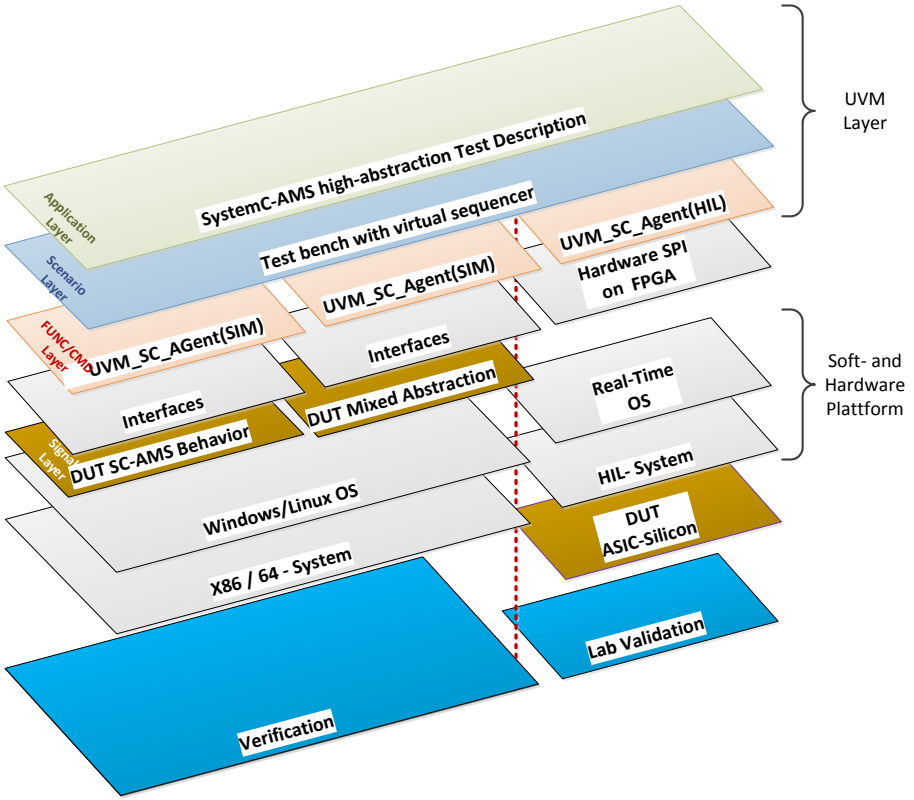
Lab Validation with UVM-SystemC

- Requirements for UVM-SystemC
  - Fully compatible C++ Compiler (SystemC … libraries)
  - Hardware interface (GPIOs, SPIs, ADCs , DACs …)
  - Performance processing system (speed, real-time)
  - Deterministic timing
- Example HIL tester
  - dSPACE – ds1006 processor with ds2211 IO Board
  - Zedboard – ARM based Zynq-SOC with real-time Linux



Advantages (1)

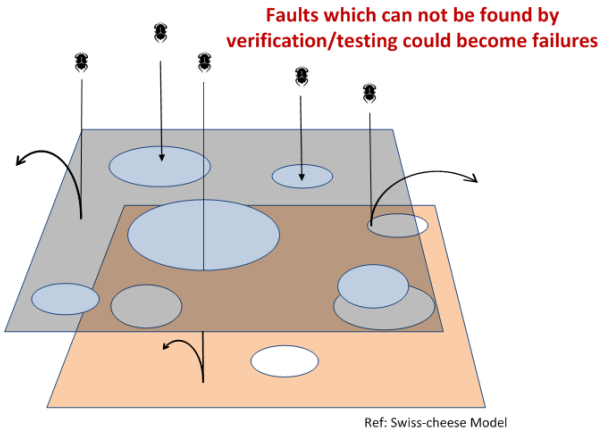
- Soft and Hardware layering
  - Re-use of Testbenches with their vectors
  - DUT Adoption via UVM Agent with Drivers and Monitors



Advantages (2)

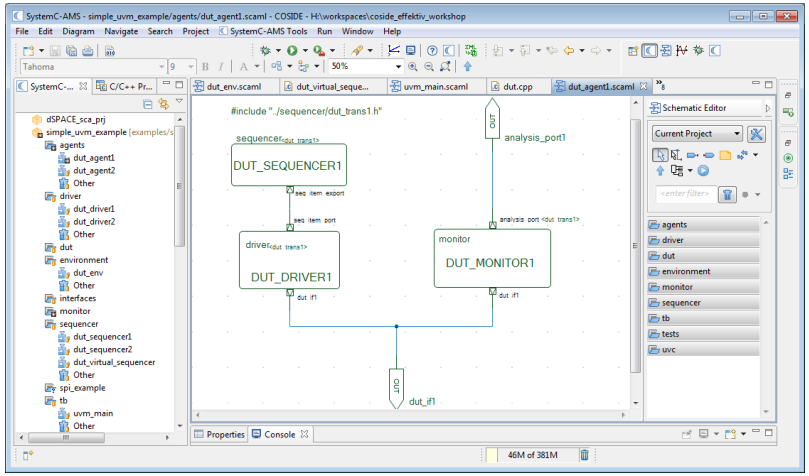
- Swiss cheese model depicts the advantages of combining methodologies to improve design quality
  - Upper Layer Computer based Simulation
  - Lower Layer lab based validation

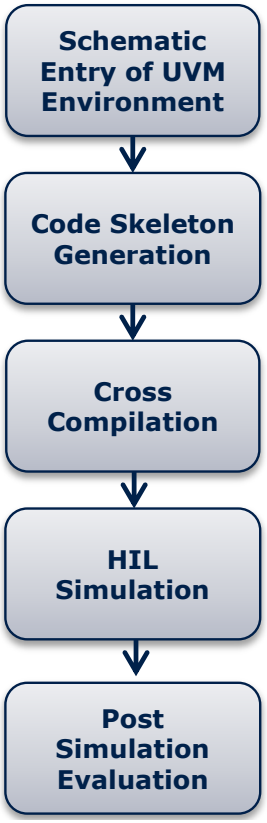
- Advantages
  - HIL performance allows randomization and therefore the coverage
  - Test vector re-use reduces effort and time of a root cause analysis



IDE Tooling

- Example integration into an existing SystemC IDE – COSIDE®
  - Schematic entry of the UVM environment
  - Generates Code skeletons
  - Integrates Cross Compilation and Test execution on HIL Tester





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   - Demo Implementation
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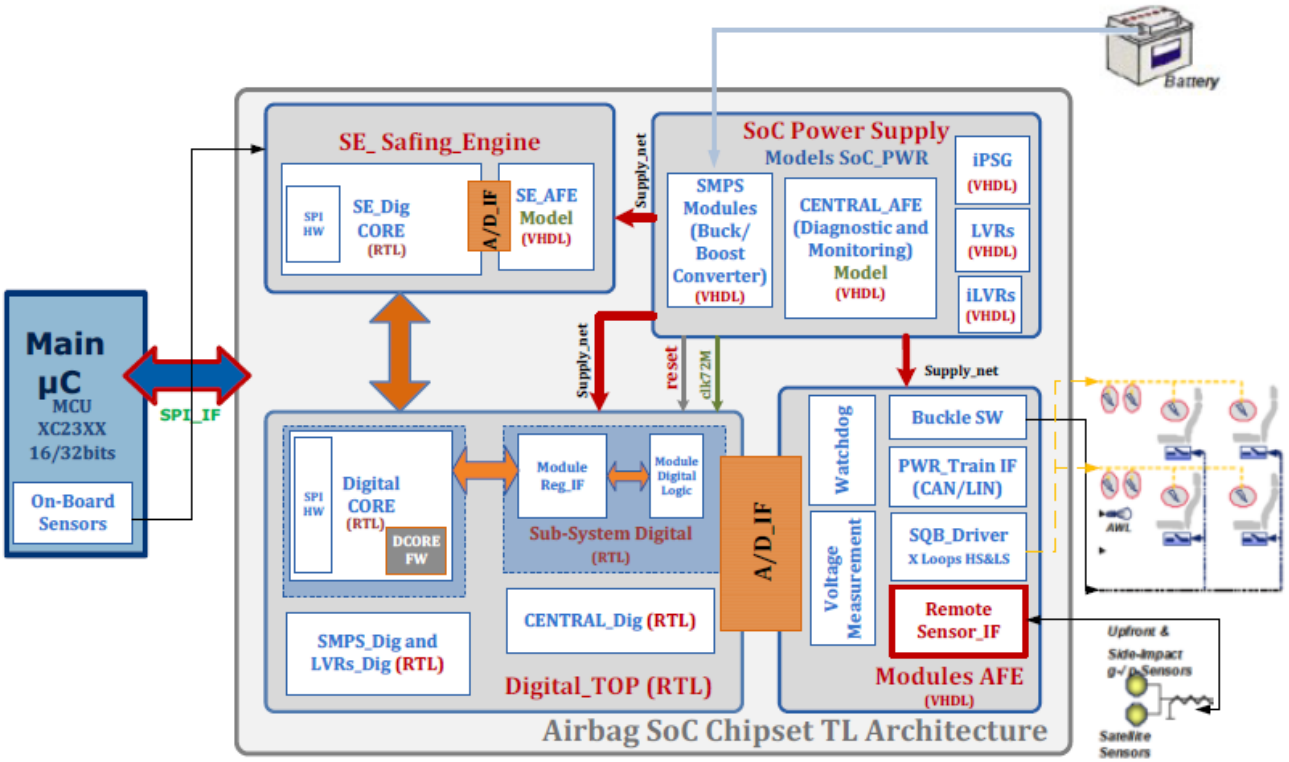
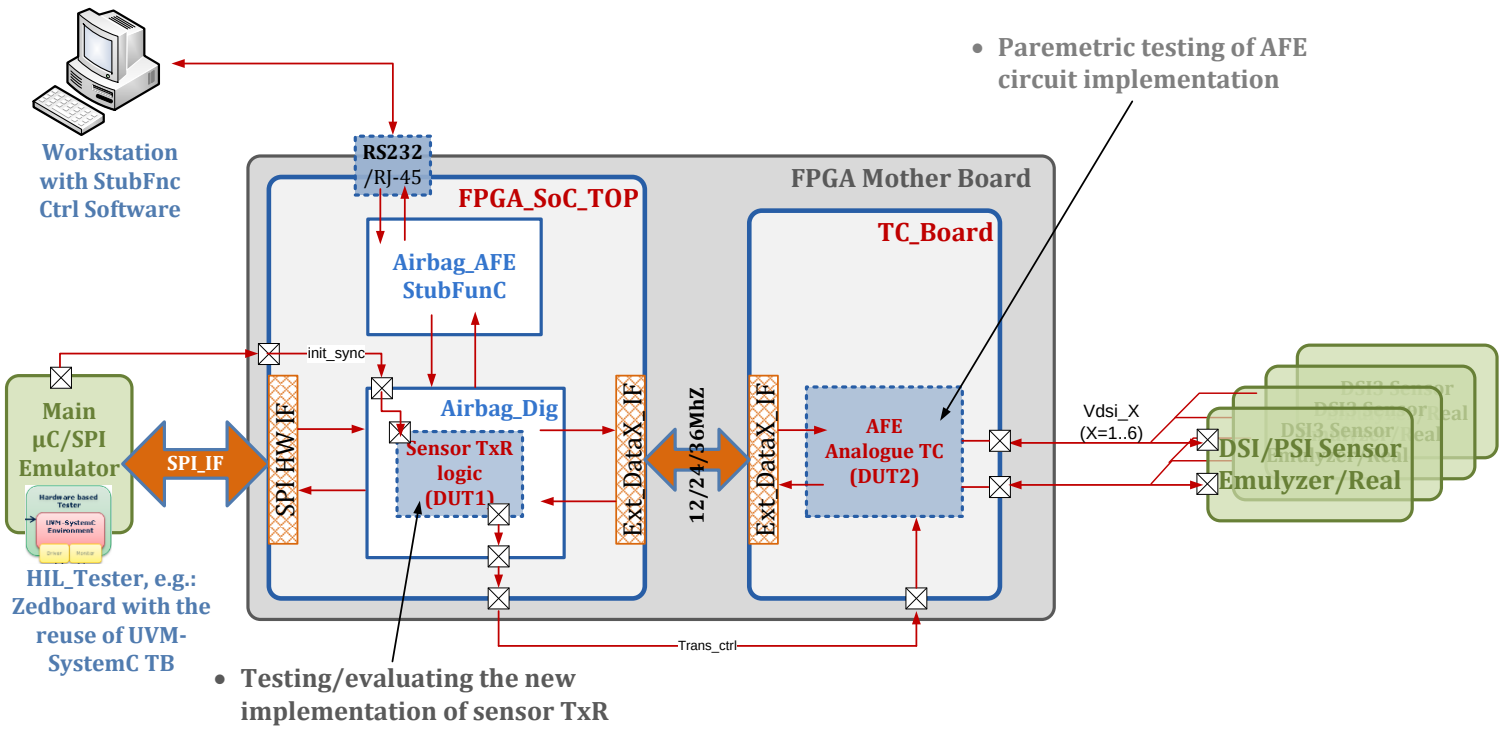
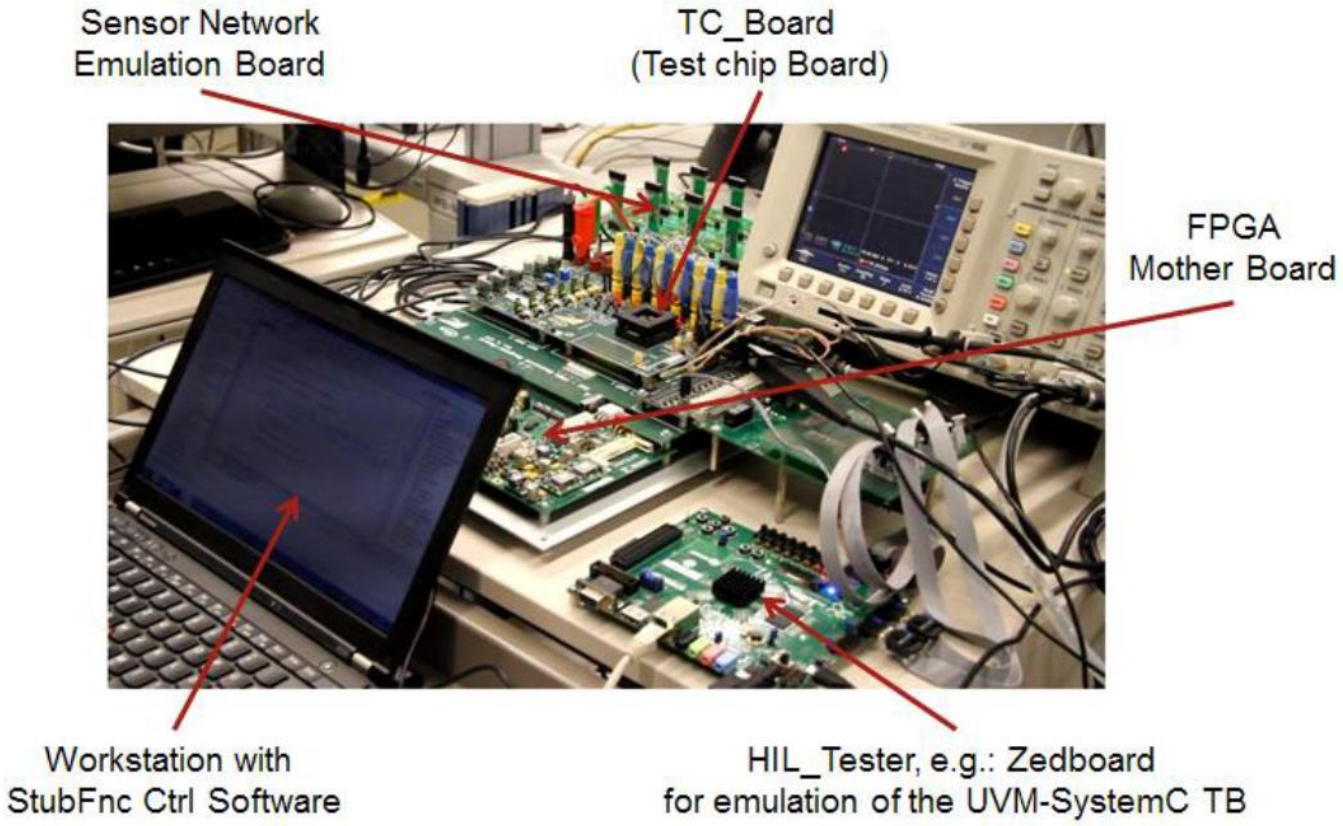
Case study – Airbag SOC



Demo implementation – Blockset



Demo implementation – Lab setup



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Summary

- Tester requirements have been investigated and defined
- Two example Tester have been introduced
- Example Tooling integration has been shown
- Advantages of the proposed methodology have been discussed
- Case Study of an Airbag SOC has proven applicability

Thank you for your attention.

Questions?

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