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Comprehensive Functional Verification (CFV)

Overview

Functional Verification is one of the most time-consuming processes in ASIC design cycle; yet a structured introductory course/training/education on this topic is often missing. Neither the educational institutes offer this nor there are vendors offering such training. While several language specific courses are offered by EDA vendors, a comprehensive training on fundamentals of functional verification is lacking. CFV course gives you an in-depth introduction to the different aspects of functional verification including different testbench architectures, their relative merits, demerits, areas of application of each architecture etc. CFV then delves into what is a good testbench, and elements of a modern day testbench. It covers all aspects of functional verification ranging from verification architecture to building testbenches, gate level simulation and various technologies used in verification such as simulation, formal, emulation

Objectives

- ❖ To explore what is verification and why it is needed and how it is achieved.
- ❖ To examine the different testbench architectures available
- ❖ To explain key features of a good testbench
- ❖ To suggest widely used guidelines and need for a methodology
- ❖ To elaborate on all the different terminologies, buzz words used in the industry
- ❖ To introduce different stages in functional verification such as RTL simulation, gate level simulation, emulation etc. and to address the challenges in each one of them



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- ASIC Design Flow
- Paradigm Shift
- Verification Challenge
- A quick Verification 101

Session 2: Different Verification Technologies

- Simulation based
- Formal methods
 - Equivalence checking
 - Model checking
 - Theorem Proving
- Hybrid
- Emulation
 - FPGA based
 - Processor based

Session 3: Verification Metrics

- Code Coverage
- Assertion coverage (Control Centric)
- Functional Coverage (Data centric)

Session 4: Testbench

- What is a testbench
- Basic testbenches
 - Rudimentary
 - TCL based
 - HDL based – basic ones



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Session 5: Sophisticated Testbenches

- Procedure based
- File IO based
- ASM based
- PLI based
- Layer based

Session 6: Testbench Process

- Strategy
 - GAME
- Environment
- Testcase

Session 7: Elements of a good testbench

- Generate (G)
 - Driver
 - Generator
- Apply (A)
 - Scoreboard
 - Checkers

Session 8: Elements of a good testbench

- Monitor (M)
 - Passive monitor
 - Active monitor
- Examine/Evaluate(E)
 - Code coverage
 - Functional coverage
 - Assertion Coverage



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Session 9: Tips and Guidelines

- Methodology
- Practical tips

Session 10: Peripheral Activities

- GLS, SDF
- Version Control
- Regression
- Role of scripts
- Verification Management

Session 11: Misc

- Unix basics
- Tool flow