Contents

Preface ................................................................. ix

Chapter 1: Introduction ............................................. 1
    Why Functional Verification Is Needed ...................... 2
    The Goal of Functional Verification .......................... 3
    Organization of This Book .................................... 8
    Approach of This Book ....................................... 9

Chapter 2: Definitions ............................................. 11
    Abstraction Levels .......................................... 11
    Verification of a Design .................................... 15
    Definition of a Test ......................................... 18

Chapter 3: Methods for Determining the Validity of a Model ...... 21
    Overview ....................................................... 21
    Stimulus Generation Methods ............................... 22
    Results Analysis Methods .................................. 35
    Summary ....................................................... 48

Chapter 4: Structure and Re-use in Functional Verification ....... 49
    Structured Elements ........................................ 50
    Highly Parallel Environments .............................. 57
    Database of Transactions .................................. 60
    Data Traffic Domains ...................................... 64
    Transactor Layering ........................................ 72
Principles of Functional Verification

Chapter 5: Random Testing

Achieving Randomization
Random Test Structures
Mixing Directed Random and Random Directed Testing
Why Is Randomization Effective?
Distribution Models
Structuring Effective Randomization Tests
The Importance of Being Idle
Randomization and Test Re-use
Limits of Randomized Testing
Running a Random Test
Summary

Chapter 6: Co-simulation

Goals of Co-simulation
Methods of Co-simulation
Choices Based on Project Requirements
Summary

Chapter 7: Measuring Verification Quality

Estimating Quality
Overview of Methods
Comparison of Methods
Real-World Considerations
Summary

Chapter 8: The Verification Plan

Goals of the Verification Plan
Phases of the Verification Plan
The Phases in Detail
Coverage and Completion Requirements
Resource Estimation

Chapter 9: Applying Functional Verification to a Project

Project Costs
Methodology
Tools
Structuring a Project
Project Management
Summary

Additional Reading

Index