Digital Systems Testing And Testable Design Solutions

Get more out of your legacy systems: more performance, functionality, reliability, and manageability Is your code easy to change? Can you get nearly instantaneous feedback when you do change it? Do you understand it? If the answer to any of these questions is no, you have legacy code, and it is draining time and money away from your development efforts. In this book, Michael Feathers offers start-to-finish strategies for working more effectively with large, untested legacy code bases. This book draws on material Michael created for his renowned Object Mentor seminars: techniques Michael has used in mentoring to help hundreds of developers, technical managers, and testers bring their legacy systems under control. The topics covered include Understanding the mechanics of software change: adding features, fixing bugs, improving design, optimizing performance Getting legacy code into a test harness Writing tests that protect you against introducing new problems Techniques that can be used with any language or platform—with examples in Java, C++, C, and C# Accurately identifying where code changes need to be made Coping with legacy systems that aren't object-oriented Handling applications that don't seem to have any structure This book also includes a catalog of twenty-four dependency-breaking techniques that help you work with program elements in isolation and make safer changes.

The Fit open source testing framework brings unprecedented agility to the entire development process. Fit for Developing Software shows you how to use Fit to clarify business rules, express them with concrete examples, and organize the examples into test tables that drive testing throughout the software lifecycle. Using a realistic case study, Rick Mugridge and Ward Cunningham--the creator of Fit--introduce each of Fit's underlying concepts and techniques, and explain how you can put Fit to work incrementally, with the lowest possible risk. Highlights include Integrating Fit into your development processes Using Fit to promote effective communication between businesspeople, testers, and developers Expressing business rules that define calculations, decisions, and business processes Connecting Fit tables to the system with "fixtures" that check whether tests are actually satisfied Constructing tests for code evolution, restructuring, and other changes to legacy systems Managing the quality and evolution of tests A companion Web site (http://fit.c2.com/) that offers additional resources and source code

This book is the second of two volumes addressing the design challenges associated with new generations of semiconductor technology. The various chapters are compiled from tutorials presented at workshops in recent years by prominent authors from all over the world. Technology, productivity and quality are the main aspects under consideration to establish the major requirements for the design and test of upcoming systems on a chip.

A textbook in digital system testing and testable design. Incorporating a significant amount of new material related to recently developed technologies, this book offers comprehensive and state-of-the-art treatment of both testing and testable design.

"This book explores different applications in V & V that spawn many areas of software development -including real time applications- where V & V techniques are required, providing in all cases examples of the applications"--Provided by publisher.

In the early days of digital design, we were concerned with the logical correctness of circuits. We knew that if we slowed down the clock signal sufficiently, the circuit would function correctly. With improvements in the semiconductor process technology, our expectations on speed have soared. A frequently asked question in the last decade has been how fast can the clock run. This puts significant demands on timing analysis and delay testing. Fueled by the above events, a tremendous growth has occurred in the research on delay testing. Recent work includes fault models, algorithms for test generation and fault simulation, and methods for design and synthesis for testability. The authors of this book, Angela Krstic and Tim Cheng,

have personally contributed to this research. Now they do an even greater service to the profession by collecting the work of a large number of researchers. In addition to expounding such a great deal of information, they have delivered it with utmost clarity. To further the reader's understanding many key concepts are illustrated by simple examples. The basic ideas of delay testing have reached a level of maturity that makes them suitable for practice. In that sense, this book is the best x DELAY FAULT TESTING FOR VLSI CIRCUITS available guide for an engineer designing or testing VLSI systems. Tech niques for path delay testing and for use of slower test equipment to test high-speed circuits are of particular interest.

Hardware -- Logic Design.

This book introduces several novel approaches to pave the way for the next generation of integrated circuits, which can be successfully and reliably integrated, even in safety-critical applications. The authors describe new measures to address the rising challenges in the field of design for testability, debug, and reliability, as strictly required for state-of-the-art circuit designs. In particular, this book combines formal techniques, such as the Satisfiability (SAT) problem and the Bounded Model Checking (BMC), to address the arising challenges concerning the increase in test data volume, as well as test application time and the required reliability. All methods are discussed in detail and evaluated extensively, while considering industry-relevant benchmark candidates. All measures have been integrated into a common framework, which implements standardized software/hardware interfaces. Provides readers with a combination of a comprehensive set of formal techniques covering and enhancing different aspects of the state-of-the-art design and test flow for ICs; Introduces newly developed heuristic, formal optimization-based and partition-based retargeting techniques and integrates them into a common framework; Describes fully compliant (with respect to industrial de-facto standard) measures to enhance the DFT, DFD and DFR capabilities while supporting standardized data exchange formats; Includes new measures to tackle shortcomings of existing state-of-the-art methods, including zero-defect enforcing safety-critical applications.

This handbook provides ready access to all of the major concepts, techniques, problems, and solutions in the emerging field of pseudorandom pattern testing. Until now, the literature in this area has been widely scattered, and published work, written by professionals in several disciplines, has treated notation and mathematics in ways that vary from source to source. This book opens with a clear description of the shortcomings of conventional testing as applied to complex digital circuits, revewing by comparison the principles of design for testability of more advanced digital technology. Offers in-depth discussions of test sequence generation and response data compression, including pseudorandom sequence generators; the mathematics of shift-register sequences and their potential for built-in testing. Also details random and memory testing and the problems of assessing the efficiency of such tests, and the limitations and practical concerns of built-in testing.

The modern electronic testing has a forty year history. Test professionals hold some fairly large conferences and numerous workshops, have a journal, and there are over one hundred books on testing. Still, a full course on testing is offered only at a few universities, mostly by professors who have a research interest in this area. Apparently, most professors would not have taken a course on electronic testing when they were students. Other than the computer engineering curriculum being too crowded, the major reason cited for the

absence of a course on electronic testing is the lack of a suitable textbook. For VLSI the foundation was provided by semiconductor device techn- ogy, circuit design, and electronic testing. In a computer engineering curriculum, therefore, it is necessary that foundations should be taught before applications. The field of VLSI has expanded to systems-on-a-chip, which include digital, memory, and mixed-signalsubsystems. To our knowledge this is the first textbook to cover all three types of electronic circuits. We have written this textbook for an undergraduate “foundations” course on electronic testing. Obviously, it is too voluminous for a one-semester course and a teacher will have to select from the topics. We did not restrict such freedom because the selection may depend upon the individual expertise and interests. Besides, there is merit in having a larger book that will retain its usefulness for the owner even after the completion of the course. With equal tenacity, we address the needs of three other groups of readers.

With Acceptance Test-Driven Development (ATDD), business customers, testers, and developers can collaborate to produce testable requirements that help them build higher quality software more rapidly. However, ATDD is still widely misunderstood by many practitioners. ATDD by Example is the first practical, entry-level, hands-on guide to implementing and successfully applying it. ATDD pioneer Markus Gärtner walks readers step by step through deriving the right systems from business users, and then implementing fully automated, functional tests that accurately reflect business requirements, are intelligible to stakeholders, and promote more effective development. Through two end-to-end case studies, Gärtner demonstrates how ATDD can be applied using diverse frameworks and languages. Each case study is accompanied by an extensive set of artifacts, including test automation classes, step definitions, and full sample implementations. These realistic examples illuminate ATDD's fundamental principles, show how ATDD fits into the broader development process, highlight tips from Gärtner's extensive experience, and identify crucial pitfalls to avoid. Readers will learn to Master the thought processes associated with successful ATDD implementation Use ATDD with Cucumber to describe software in ways businesspeople can understand Test web pages using ATDD tools Bring ATDD to Java with the FitNesse wiki-based acceptance test framework Use examples more effectively in Behavior-Driven Development (BDD) Specify software collaboratively through innovative workshops Implement more user-friendly and collaborative test automation Test more cleanly, listen to test results, and refactor tests for greater value If you're a tester, analyst, developer, or project manager, this book offers a concrete foundation for achieving real benefits with ATDD now–and it will help you reap even more value as you gain experience.

This Textbook Provides A Comprehensive And Detailed Treatment Of Digital Systems Testing And Testable Design. It Covers Thoroughly Both The Fundamental Concepts And The Latest Advances In This Rapidly Changing Field, And Presents Only Theoretical Material That Supports Practical

Applications. Successfully Used Worldwide, This Book Is An Invaluable Tool For Test Engineers, Asic And System Designers, And Cad Developers.

Provides the only up-to-date source on the most recent advances inthis often complex and fascinating topic. The only book to be entirely devoted to clocking Clocking has become one of the most important topics in thefield of digital system design A "must have" book for advanced circuit engineers

Explains the importance of the test-driven environment in assuring quality while developing software, introducing patterns, principles, and techniques for testing any software system.

This book is about digital system testing and testable design. The concepts of testing and testability are treated together with digital design practices and methodologies. The book uses Verilog models and testbenches for implementing and explaining fault simulation and test generation algorithms. Extensive use of Verilog and Verilog PLI for test applications is what distinguishes this book from other test and testability books. Verilog eliminates ambiguities in test algorithms and BIST and DFT hardware architectures, and it clearly describes the architecture of the testability hardware and its test sessions. Describing many of the on-chip decompression algorithms in Verilog helps to evaluate these algorithms in terms of hardware overhead and timing, and thus feasibility of using them for System-on-Chip designs. Extensive use of testbenches and testbench development techniques is another unique feature of this book. Using PLI in developing testbenches and virtual testers provides a powerful programming tool, interfaced with hardware described in Verilog. This mixed hardware/software environment facilitates description of complex test programs and test strategies.

One skill that’s essential for any professional JavaScript developer is the ability to write testable code. This book shows you what writing and maintaining testable JavaScript for the client- or server-side actually entails, whether you’re creating a new application or rewriting legacy code. From methods to reduce code complexity to unit testing, code coverage, debugging, and automation, you’ll learn a holistic approach for writing JavaScript code that you and your colleagues can easily fix and maintain going forward. Testing JavaScript code is complicated. This book helps experienced JavaScript developers simply the process considerably. Get an overview of Agile, test-driven development, and behavior-driven development Use patterns from static languages and standards-based JavaScript to reduce code complexity Learn the advantages of event-based architectures, including modularity, loose coupling, and reusability Explore tools for writing and running unit tests at the functional and application level Generate code coverage to measure the scope and effectiveness of your tests Conduct integration, performance, and load testing, using Selenium or CasperJS Use tools for in-browser, Node.js, mobile, and production debugging Understand what, when, and how to automate your development processes

This textbook provides a comprehensive and detailed treatment of digital systems testing and testable design. It covers thoroughly both the fundamental concepts and the

latest advances in this rapidly changing field, and presents only theoretical material that supports practical applications. Successfully used worldwide, this book is an invaluable tool for test engineers, ASIC and system designers, and CAD developers.

This updated printing of the leading text and reference in digital systems testing and testable design provides comprehensive, state-of-the-art coverage of the field. Included are extensive discussions of test generation, fault modeling for classic and new technologies, simulation, fault simulation, design for testability, built-in self-test, and diagnosis. Complete with numerous problems, this book is a must-have for test engineers, ASIC and system designers, and CAD developers, and advanced engineering students will find this book an invaluable tool to keep current with recent changes in the field.

Effective Software Testing explores fifty critically important best practices, pitfalls, and solutions. Gleaned from the author's extensive practical experience, these concrete items will enable quality assurance professionals and test managers to immediately enhance their understanding and skills, avoid costly mistakes, and implement a state-of-the-art testing program. This book places special emphasis on the integration of testing into all phases of the software development life cycle--from requirements definition to design and final coding. The fifty lessons provided here focus on the key aspects of software testing: test planning, design, documentation, execution, managing the testing team, unit testing, automated testing, nonfunctional testing, and more. You will learn to: Base testing efforts on a prioritized feature schedule Estimate test preparation and execution Define the testing team roles and responsibilities Design test procedures as soon as requirements are available Derive effective test cases from requirements Avoid constraints and detailed data elements in test procedures Make unit-test execution part of the build process Use logging to increase system testability Test automated test tools on an application prototype Automate regression tests whenever possible Avoid sole reliance on capture/playback Conduct performance testing with production-sized databases Tailor usability tests to the intended audience Isolate the test environment from the development environment Implement a defect tracking life cycle Throughout the book, numerous real-world case studies and concrete examples illustrate the successful application of these important principles and techniques. Effective Software Testing provides ready access to the expertise and advice of one of the world's foremost software quality and testing authorities. 0201794292B12032002

Lala conveys concepts in a clear, informal manner, reaching abstract levels only when absolutely necessary. The objective is to not to avoid necessary theory, but to demonstrate theory through examples in order to establish the th eoretical basis for practical applications. This book presents the essentials of modern logic design, including many topics that are inadequately covered or completely ignored in other book.

Practical Problems in VLSI Physical Design Automation contains problems and solutions related to various well-known algorithms used in VLSI physical design automation. Dr. Lim believes that the best way to learn new algorithms is to walk through a small example by hand. This knowledge will greatly help understand, analyze, and improve some of the well-known algorithms. The author has designed and taught a graduate-level course on physical CAD for VLSI at Georgia Tech. Over the years he has written his homework with such a focus and has maintained typeset

version of the solutions.

Digital Systems Testing and Testable Design

How do successful agile teams deliver bug-free, maintainable software—iteration after iteration? The answer is: By seamlessly combining development and testing. On such teams, the developers write testable code that enables them to verify it using various types of automated tests. This approach keeps regressions at bay and prevents "testing crunches"—which otherwise may occur near the end of an iteration—from ever happening. Writing testable code, however, is often difficult, because it requires knowledge and skills that cut across multiple disciplines. In Developer Testing, leading test expert and mentor Alexander Tarlinder presents concise, focused guidance for making new and legacy code far more testable. Tarlinder helps you answer questions like: When have I tested this enough? How many tests do I need to write? What should my tests verify? You'll learn how to design for testability and utilize techniques like refactoring, dependency breaking, unit testing, data-driven testing, and test-driven development to achieve the highest possible confidence in your software. Through practical examples in Java, C#, Groovy, and Ruby, you'll discover what works—and what doesn't. You can quickly begin using Tarlinder's technology-agnostic insights with most languages and toolsets while not getting buried in specialist details. The author helps you adapt your current programming style for testability, make a testing mindset "second nature," improve your code, and enrich your day-to-day experience as a software professional. With this guide, you will Understand the discipline and vocabulary of testing from the developer's standpoint Base developer tests on well-established testing techniques and best practices Recognize code constructs that impact testability Effectively name, organize, and execute unit tests Master the essentials of classic and "mockist-style" TDD Leverage test doubles with or without mocking frameworks Capture the benefits of programming by contract, even without runtime support for contracts Take control of dependencies between classes, components, layers, and tiers Handle combinatorial explosions of test cases, or scenarios requiring many similar tests Manage code duplication when it can't be eliminated Actively maintain and improve your test suites Perform more advanced tests at the integration, system, and end-to-end levels Develop an understanding for how the organizational context influences quality assurance Establish well-balanced and effective testing strategies suitable for agile teams

This is the eBook of the printed book and may not include any media, website access codes, or print supplements that may come packaged with the bound book. For all courses in digital electronics, from introductory through advanced. Like previous editions, this text will be used widely in technology classes ranging from high schools and two-year programs to four-year engineering, engineering technology, and computer science programs. Take a journey in Digital Systems from novice to expert Written for all courses in digital electronics—from introductory to advanced, from high school to two- and four-year college programs—this Twelfth Edition of Digital Systems thoroughly prepares students for the study of digital systems and computer and microcontroller hardware. The text begins with the basics of digital systems, including the AHDL hardware description language, then gradually progresses to increasingly challenging topics, including the more complex VHDL. The text is comprehensive yet highly readable, clearly introducing the purpose and fundamentals of each topic before delving

into more technical descriptions. It is also definition-focused, with new terms listed in each chapter and defined in a glossary. This Twelfth Edition has been thoroughly revised and updated with new material on section-level learning outcomes, Quadrature Shaft Encoders used to obtain absolute shaft positions, troubleshooting prototype circuits using systematic fault isolation techniques, Time Division Multiplexing, expanded discussion of VHDL data objects and more!

A superior primer on software testing and quality assurance, from integration to execution and automation This important new work fills the pressing need for a user-friendly text that aims to provide software engineers, software quality professionals, software developers, and students with the fundamental developments in testing theory and common testing practices. Software Testing and Quality Assurance: Theory and Practice equips readers with a solid understanding of: Practices that support the production of quality software Software testing techniques Life-cycle models for requirements, defects, test cases, and test results Process models for units, integration, system, and acceptance testing How to build test teams, including recruiting and retaining test engineers Quality Models, Capability Maturity Model, Testing Maturity Model, and Test Process Improvement Model Expertly balancing theory with practice, and complemented with an abundance of pedagogical tools, including test questions, examples, teaching suggestions, and chapter summaries, this book is a valuable, self-contained tool for professionals and an ideal introductory text for courses in software testing, quality assurance, and software engineering.

Is software quality testing really effective or just a waste of time? The skeptics conclude that it is an exercise in futility to try to measure the reliability and safety of these complex systems under all critical circumstances. They contend that quality assurance comes only through a strict adherence to rigorous development process models. In this groundbreaking book, Michael Friedman and Jeffrey Voas dispel that myth. They demonstrate that extremely accurate, cost-effective software quality testing can now be a reality, thanks to powerful new analytical tools. Central to the approach outlined in Software Assessment is a sophisticated assessment optimization technique called testability analysis. Pioneered at the College of William and Mary and NASA by Jeffrey Voas, testability analysis predicts the likelihood that latent bugs will be detected during testing. Drawing upon their experiences working on various high-profile projects—including air traffic control systems, an automated high-speed train-control system, and a CASE-generated autopilot system—they describe how testability analysis is used to determine which tests work and which do not; how much testing should be done on a given program; which areas of a program (modules, lines of code, etc.) are the most testable and which are the least testable; and how to allocate precious resources. The authors also describe original techniques for designing and coding programs to maximize their testability and a new method of generating test cases to support testing and testability analysis. Software Assessment offers a balanced presentation of theory and practice and is designed to function as either (continued on back flap) (continued from front flap) graduate-level text or professional reference. Featuring exhaustive coverage of the theoretical foundations of reliability, safety, and testability, it uses real-world examples, illustrations, and clear descriptions to explore all of the latest techniques for assessing those qualities. Information technology and the software that makes it possible are vital aspects of our economic, political, and cultural lives. Software Assessment provides powerful new tools for assessing and enhancing the safety, reliability, and testability of these crucial resources. Software Assessment Breakthrough tools and techniques that make accurate, cost-effective software quality testing a reality Written by two of the most prominent figures in the field of software quality testing, Software Assessment arms software designers and developers with cutting-edge tools and techniques for measuring and enhancing the safety, reliability, and testability of the programs they produce. Drawing upon

their experiences working on major software projects at NASA and other agencies for which software quality is literally a matter of life and death, Michael Friedman and Jeffrey Voas show you how to: Use powerful testability tools and techniques to optimize the testing process Execute programs to perform automated quality testing Design and code programs for maximum testability Generate test cases to support testing and testability analysis And much more Cover Design/Illustration: Robin Lee Malik

The classic, landmark work on software testing The hardware and software of computing have changed markedly in the three decades since the first edition of The Art of Software Testing, but this book's powerful underlying analysis has stood the test of time. Whereas most books on software testing target particular development techniques, languages, or testing methods, The Art of Software Testing, Third Edition provides a brief but powerful and comprehensive presentation of time-proven software testing approaches. If your software development project is mission critical, this book is an investment that will pay for itself with the first bug you find. The new Third Edition explains how to apply the book's classic principles to today's hot topics including: Testing apps for iPhones, iPads, BlackBerrys, Androids, and other mobile devices Collaborative (user) programming and testing Testing for Internet applications, e-commerce, and agile programming environments Whether you're a student looking for a testing guide you'll use for the rest of your career, or an IT manager overseeing a software development team, The Art of Software Testing, Third Edition is an expensive book that will pay for itself many times over.

Summary Effective Unit Testing is written to show how to write good tests—tests that are concise and to the point, expressive, useful, and maintainable. Inspired by Roy Osherove's bestselling The Art of Unit Testing, this book focuses on tools and practices specific to the Java world. It introduces you to emerging techniques like behavior-driven development and specification by example, and shows you how to add robust practices into your toolkit. About Testing Test the components before you assemble them into a full application, and you'll get better software. For Java developers, there's now a decade of experience with well-crafted tests that anticipate problems, identify known and unknown dependencies in the code, and allow you to test components both in isolation and in the context of a full application. About this Book Effective Unit Testing teaches Java developers how to write unit tests that are concise, expressive, useful, and maintainable. Offering crisp explanations and easy-to-absorb examples, it introduces emerging techniques like behavior-driven development and specification by example. Programmers who are already unit testing will learn the current state of the art. Those who are new to the game will learn practices that will serve them well for the rest of their career. Purchase of the print book comes with an offer of a free PDF, ePub, and Kindle eBook from Manning. Also available is all code from the book. About the Author Lasse Koskela is a coach, trainer, consultant, and programmer. He hacks on open source projects, helps companies improve their productivity, and speaks frequently at conferences around the world. Lasse is the author of Test Driven, also published by Manning. What's Inside A thorough introduction to unit testing Choosing best-of-breed tools Writing tests using dynamic languages Efficient test automation Table of Contents PART 1 FOUNDATIONS The promise of good tests In search of good Test doubles PART 2 CATALOG Readability Maintainability Trustworthiness PART 3 DIVERSIONS Testable design Writing tests in other JVM languages Speeding up test execution

Using the book and the software provided with it, the reader can build his/her own tester arrangement to investigate key aspects of analog-, digital- and mixed system circuits Plan of attack based on traditional testing, circuit design and circuit manufacture allows the reader to appreciate a testing regime from the point of view of all the participating interests Worked examples based on theoretical bookwork, practical experimentation and simulation exercises teach the reader how to test circuits thoroughly and effectively

This book is a comprehensive guide to new DFT methods that will show the readers how to design a testable and quality product, drive down test cost, improve product quality and yield, and speed up time-to-market and time-to-volume. Most up-to-date coverage of design for testability. Coverage of industry practices commonly found in commercial DFT tools but not discussed in other books. Numerous, practical examples in each chapter illustrating basic VLSI test principles and DFT architectures.

Modern electronics testing has a legacy of more than 40 years. The introduction of new technologies, especially nanometer technologies with 90nm or smaller geometry, has allowed the semiconductor industry to keep pace with the increased performance-capacity demands from consumers. As a result, semiconductor test costs have been growing steadily and typically amount to 40% of today's overall product cost. This book is a comprehensive guide to new VLSI Testing and Design-for-Testability techniques that will allow students, researchers, DFT practitioners, and VLSI designers to master quickly System-on-Chip Test architectures, for test debug and diagnosis of digital, memory, and analog/mixed-signal designs. Emphasizes VLSI Test principles and Design for Testability architectures, with numerous illustrations/examples. Most up-to-date coverage available, including Fault Tolerance, Low-Power Testing, Defect and Error Tolerance, Network-on-Chip (NOC) Testing, Software-Based Self-Testing, FPGA Testing, MEMS Testing, and System-In-Package (SIP) Testing, which are not yet available in any testing book. Covers the entire spectrum of VLSI testing and DFT architectures, from digital and analog, to memory circuits, and fault diagnosis and self-repair from digital to memory circuits. Discusses future nanotechnology test trends and challenges facing the nanometer design era; promising nanotechnology test techniques, including Quantum-Dots, Cellular Automata, Carbon-Nanotubes, and Hybrid Semiconductor/Nanowire/Molecular Computing. Practical problems at the end of each chapter for students.

Your road map for meeting today's digital testing challenges Today, digital logic devices are common in products that impact public safety, including applications in transportation and human implants. Accurate testing has become more critical to reliability, safety, and the bottom line. Yet, as digital systems become more ubiquitous and complex, the challenge of testing them has become more difficult. As one development group designing a RISC stated, "the work required to . . . test a chip of this size approached the amount of effort required to design it." A valued reference for nearly two decades, Digital Logic Testing and Simulation has been significantly revised and updated for designers and test engineers who must meet this challenge. There is no single solution to the testing problem. Organized in an easy-to-follow, sequential format, this Second Edition familiarizes the reader with the many different strategies for testing and their applications, and assesses the strengths and weaknesses of the various approaches. The book reviews the building blocks of a successful testing strategy and guides the reader on choosing the best solution for a particular application. Digital Logic Testing and Simulation, Second Edition covers such key topics as: * Binary Decision Diagrams (BDDs) and cycle-based simulation * Tester architectures/Standard Test Interface Language (STIL) * Practical algorithms written in a Hardware Design Language (HDL) * Fault tolerance * Behavioral Automatic Test Pattern Generation (ATPG) * The development of the Test Design Expert (TDX), the many obstacles encountered and lessons learned in creating this novel testing approach Up-to-date and comprehensive, Digital Logic Testing and Simulation is an important resource for anyone charged with pinpointing faulty products and assuring quality, safety, and profitability.

An Introduction to Logic Circuit Testing provides a detailed coverage of techniques for test generation and testable design of digital electronic circuits/systems. The material covered in the book should be sufficient for a course, or part of a course, in digital circuit testing for senior-level undergraduate and first-year graduate students in Electrical Engineering and Computer

Science. The book will also be a valuable resource for engineers working in the industry. This book has four chapters. Chapter 1 deals with various types of faults that may occur in very large scale integration (VLSI)-based digital circuits. Chapter 2 introduces the major concepts of all test generation techniques such as redundancy, fault coverage, sensitization, and backtracking. Chapter 3 introduces the key concepts of testability, followed by some ad hoc design-for-testability rules that can be used to enhance testability of combinational circuits. Chapter 4 deals with test generation and response evaluation techniques used in BIST (built-in self-test) schemes for VLSI chips. Table of Contents: Introduction / Fault Detection in Logic Circuits / Design for Testability / Built-in Self-Test / References

Extensively class-tested, this textbook takes an innovative approach to software testing: it defines testing as the process of applying a few well-defined, general-purpose test criteria to a structure or model of the software. It incorporates the latest innovations in testing, including techniques to test modern types of software such as OO, web applications, and embedded software. The book contains numerous examples throughout. An instructor's solution manual, PowerPoint slides, sample syllabi, additional examples and updates, testing tools for students, and example software programs in Java are available on an extensive website.

Device testing represents the single largest manufacturing expense in the semiconductor industry, costing over $40 billion a year. The most comprehensive and wide ranging book of its kind, Testing of Digital Systems covers everything you need to know about this vitally important subject. Starting right from the basics, the authors take the reader through automatic test pattern generation, design for testability and built-in self-test of digital circuits before moving on to more advanced topics such as IDDQ testing, functional testing, delay fault testing, memory testing, and fault diagnosis. The book includes detailed treatment of the latest techniques including test generation for various fault models, discussion of testing techniques at different levels of integrated circuit hierarchy and a chapter on system-on-a-chip test synthesis. Written for students and engineers, it is both an excellent senior/graduate level textbook and a valuable reference.

More than ever, mission-critical and business-critical applications depend on object-oriented (OO) software. Testing techniques tailored to the unique challenges of OO technology are necessary to achieve high reliability and quality. "Testing Object-Oriented Systems: Models, Patterns, and Tools" is an authoritative guide to designing and automating test suites for OO applications. This comprehensive book explains why testing must be model-based and provides in-depth coverage of techniques to develop testable models from state machines, combinational logic, and the Unified Modeling Language (UML). It introduces the test design pattern and presents 37 patterns that explain how to design responsibility-based test suites, how to tailor integration and regression testing for OO code, how to test reusable components and frameworks, and how to develop highly effective test suites from use cases. Effective testing must be automated and must leverage object technology. The author describes how to design and code specification-based assertions to offset testability losses due to inheritance and polymorphism. Fifteen micro-patterns present oracle strategies--practical solutions for one of the hardest problems in test design. Seventeen design patterns explain how to automate your test suites with a coherent OO test harness framework. The author provides thorough coverage of testing issues such as: The bug hazards of OO programming and differences from testing procedural code How to design responsibility-based tests for classes, clusters, and subsystems using class invariants, interface data flow models, hierarchic state machines, class associations, and scenario analysis How to support reuse by effective testing of abstract classes, generic classes, components, and frameworks How to choose an integration strategy that supports iterative and incremental development How to achieve comprehensive system testing with testable use cases How to choose a regression test approach How to develop expected test results and evaluate the post-test state of an object How to automate testing with

assertions, OO test drivers, stubs, and test frameworks Real-world experience, world-class best practices, and the latest research in object-oriented testing are included. Practical examples illustrate test design and test automation for Ada 95, C++, Eiffel, Java, Objective-C, and Smalltalk. The UML is used throughout, but the test design patterns apply to systems developed with any OO language or methodology. 0201809389B04062001

DIGITAL SYSTEMS DESIGN USING VERILOG integrates coverage of logic design principles, Verilog as a hardware design language, and FPGA implementation to help electrical and computer engineering students master the process of designing and testing new hardware configurations. A Verilog equivalent of authors Roth and John's previous successful text using VHDL, this practical book presents Verilog constructs side-by-side with hardware, encouraging students to think in terms of desired hardware while writing synthesizable Verilog. Following a review of the basic concepts of logic design, the authors introduce the basics of Verilog using simple combinational circuit examples, followed by models for simple sequential circuits. Subsequent chapters ask readers to tackle more and more complex designs. Important Notice: Media content referenced within the product description or the product text may not be available in the ebook version.

Master high quality software development driven by unit tests About This Book Design and implement robust system components by means of the de facto unit testing standard in Java Reduce defect rate and maintenance effort, plus simultaneously increase code quality and development pace Follow a step-by-step tutorial imparting the essential techniques based on real-world scenarios and code walkthroughs Who This Book Is For No matter what your specific background as a Java developer, whether you're simply interested in building up a safety net to reduce regressions of your desktop application or in improving your server-side reliability based on robust and reusable components, unit testing is the way to go. This book provides you with a comprehensive but concise entrance advancing your knowledge step-wise to a professional level. What You Will Learn Organize your test infrastructure and resources reasonably Understand and write well structured tests Decompose your requirements into small and independently testable units Increase your testing efficiency with on-the-fly generated stand-in components and deal with the particularities of exceptional flow Employ runners to adjust to specific test demands Use rules to increase testing safety and reduce boilerplate Use third party supplements to improve the expressiveness of your verification statements In Detail JUnit has matured to become the most important tool when it comes to automated developer tests in Java. Supported by all IDEs and build systems, it empowers programmers to deliver software features reliably and efficiently. However, writing good unit tests is a skill that needs to be learned; otherwise it's all too easy to end up in gridlocked development due to messed up production and testing code. Acquiring the best practices for unit testing will help you to prevent such problems and lead your projects to success with respect to quality and costs. This book explains JUnit concepts and best practices applied to the test first approach, a foundation for high quality Java components delivered in time and budget. From the beginning you'll be guided continuously through a practically relevant example and pick up background knowledge and development techniques step by step. Starting with the basics of tests organization you'll soon comprehend the necessity of well structured tests and delve into the relationship of requirement decomposition and the many-faceted world of test double usage. In conjunction with third-party tools you'll be trained in writing your tests efficiently, adapt your test case environment to particular demands and increase the expressiveness of your verification statements. Finally, you'll experience continuous integration as the perfect complement to support short feedback cycles and quality related reports for your whole team. The tutorial gives a profound entry point in the essentials of unit testing with JUnit and prepares you for test-related daily work challenges. Style and approach This is an intelligible tutorial based on an ongoing and non-trivial development

example. Profound introductions of concepts and techniques are provided stepwise as the programming challenges evolve. This allows you to reproduce and practice the individual skills thoroughly.

This book provides broad and comprehensive coverage of the entire EDA flow. EDA/VLSI practitioners and researchers in need of fluency in an "adjacent" field will find this an invaluable reference to the basic EDA concepts, principles, data structures, algorithms, and architectures for the design, verification, and test of VLSI circuits. Anyone who needs to learn the concepts, principles, data structures, algorithms, and architectures of the EDA flow will benefit from this book. Covers complete spectrum of the EDA flow, from ESL design modeling to logic/test synthesis, verification, physical design, and test - helps EDA newcomers to get "up-and-running" quickly Includes comprehensive coverage of EDA concepts, principles, data structures, algorithms, and architectures - helps all readers improve their VLSI design competence Contains latest advancements not yet available in other books, including Test compression, ESL design modeling, large-scale floorplanning, placement, routing, synthesis of clock and power/ground networks - helps readers to design/develop testable chips or products Includes industry best-practices wherever appropriate in most chapters - helps readers avoid costly mistakes

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