

Digital Design And Computer Architecture Arm Edition

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Digital Design and Computer Architecture - David Harris 2015-04-22

Digital Design and Computer Architecture: ARM Edition takes a unique and modern approach to digital design. Beginning with digital logic gates and progressing to the design of combinational and sequential circuits, Harris and Harris use these fundamental building blocks as the basis for what follows: the design of an actual ARM processor. With over 75% of the world's population using products with ARM processors, the design of the ARM processor offers an exciting and timely application of digital design while also teaching the fundamentals of computer architecture. SystemVerilog and VHDL are integrated throughout the text in examples illustrating the methods and techniques for CAD-based circuit design. By the end of this book, readers will be able to build their own microprocessor and will have a top-to-bottom understanding of how it works. Harris and Harris have combined an engaging and humorous writing style with an updated and hands-on approach to digital design. Covers the fundamentals of digital logic design and reinforces logic concepts through the design of an ARM microprocessor. Features side-by-side examples of the two most prominent Hardware Description Languages (HDLs)-SystemVerilog and VHDL-which illustrate and compare the ways each can be used in the design of digital systems. Includes examples throughout the text that enhance the reader's understanding and retention of key concepts and techniques. The Companion website includes a chapter on I/O systems with practical examples that show how to use the Raspberry Pi computer to communicate with peripheral devices such as LCDs, Bluetooth radios, and motors. The Companion website also includes appendices covering practical digital design issues and C programming as well as links to CAD tools, lecture slides, laboratory projects, and solutions to exercises.

Computer Organization and Design - David A. Patterson 2011-10-26

"Presents the fundamentals of hardware technologies, assembly language, computer arithmetic, pipelining, memory hierarchies and I/O"--

Modern Computer Architecture and Organization - Jim Ledin 2020-04-30

A no-nonsense, practical guide to current and future processor and computer architectures, enabling you to design computer systems and develop better software applications across a variety of domains
Key Features
Understand digital circuitry with the help of transistors, logic gates, and sequential logic
Examine the architecture and instruction sets of x86, x64, ARM, and RISC-V processors
Explore the architecture of modern devices such as the iPhone X and high-performance gaming PCs
Book Description
Are you a software developer, systems designer, or computer architecture student looking for a methodical introduction to digital device architectures but overwhelmed by their complexity? This book will help you to learn how modern computer systems work, from the lowest level of transistor switching to the macro view of collaborating multiprocessor servers. You'll gain unique insights into the internal behavior of processors that execute the code developed in high-level languages and enable you to design more efficient and scalable software systems. The book will teach you the fundamentals of computer systems including transistors, logic gates, sequential logic, and instruction operations. You will learn details of modern processor architectures and instruction sets including x86, x64, ARM, and RISC-V. You will see how to implement a RISC-V processor in a low-cost FPGA board and how to write a quantum computing program and run it on an actual quantum computer. By the end of this book, you will have a thorough understanding of modern processor and computer architectures and the future directions these architectures are likely to take. What you will learn
Get to grips with transistor technology and digital circuit principles
Discover the functional elements of computer processors
Understand pipelining and superscalar execution
Work with floating-point data formats
Understand the purpose and operation of the supervisor mode
Implement a complete RISC-V processor in a low-cost FPGA
Explore the techniques used in virtual machine

implementation
Write a quantum computing program and run it on a quantum computer
Who this book is for
This book is for software developers, computer engineering students, system designers, reverse engineers, and anyone looking to understand the architecture and design principles underlying modern computer systems from tiny embedded devices to warehouse-size cloud server farms. A general understanding of computer processors is helpful but not required.

Arm System-On-Chip Architecture, 2/E - Furber 2001-09

Fundamentals of System-on-Chip Design on Arm Cortex-M Microcontrollers - René Beuchat 2021-08-02

This textbook aims to provide learners with an understanding of embedded systems built around Arm Cortex-M processor cores, a popular CPU architecture often used in modern low-power SoCs that target IoT applications. Readers will be introduced to the basic principles of an embedded system from a high-level hardware and software perspective and will then be taken through the fundamentals of microcontroller architectures and SoC-based designs. Along the way, key topics such as chip design, the features and benefits of Arm's Cortex-M processor architectures (including TrustZone, CMSIS and AMBA), interconnects, peripherals and memory management are discussed. The material covered in this book can be considered as key background for any student intending to major in computer engineering and is suitable for use in an undergraduate course on digital design.

Logical Effort - Ivan Sutherland 1999

Designers of high-speed integrated circuits face a bewildering array of choices and too often spend frustrating days tweaking gates to meet speed targets. Logical Effort: Designing Fast CMOS Circuits makes high speed design easier and more methodical, providing a simple and broadly applicable method for estimating the delay resulting from factors such as topology, capacitance, and gate sizes. The brainchild of circuit and computer graphics pioneers Ivan Sutherland and Bob Sproull, "logical effort" will change the way you approach design challenges. This book begins by equipping you with a sound understanding of the method's essential procedures and concepts-so you can start using it immediately. Later chapters explore the theory and finer points of the method and detail its specialized applications. Features
Explains the method and how to apply it in two practically focused chapters. Improves circuit design intuition by teaching simple ways to discern the consequences of topology and gate size decisions. Offers easy ways to choose the fastest circuit from among an array of potential circuit designs. Reduces the time spent on tweaking and simulations-so you can rapidly settle on a good design. Offers in-depth coverage of specialized areas of application for logical effort: skewed or unbalanced gates, other circuit families (including pseudo-NMOS and domino), wide structures such as decoders, and irregularly forking circuits. Presents a complete derivation of the method-so you see how and why it works.

Computer Architecture - John L. Hennessy 2012

The computing world today is in the middle of a revolution: mobile clients and cloud computing have emerged as the dominant paradigms driving programming and hardware innovation today. The Fifth Edition of Computer Architecture focuses on this dramatic shift, exploring the ways in which software and technology in the cloud are accessed by cell phones, tablets, laptops, and other mobile computing devices. Each chapter includes two real-world examples, one mobile and one datacenter, to illustrate this revolutionary change. Updated to cover the mobile computing revolution Emphasizes the two most important topics in architecture today: memory hierarchy and parallelism in all its forms. Develops common themes throughout each chapter: power, performance, cost, dependability, protection, programming models, and emerging trends ("What's Next") Includes three review appendices in the printed text. Additional reference appendices are available online. Includes

updated Case Studies and completely new exercises.

Essentials of Computer Architecture, Second Edition - Douglas Comer
2017-01-06

This easy to read textbook provides an introduction to computer architecture, while focusing on the essential aspects of hardware that programmers need to know. The topics are explained from a programmer's point of view, and the text emphasizes consequences for programmers. Divided in five parts, the book covers the basics of digital logic, gates, and data paths, as well as the three primary aspects of architecture: processors, memories, and I/O systems. The book also covers advanced topics of parallelism, pipelining, power and energy, and performance. A hands-on lab is also included. The second edition contains three new chapters as well as changes and updates throughout.

17th International Conference on Information Technology-New Generations (ITNG 2020) - Shahram Latifi 2020-05-11

This volume presents the 17th International Conference on Information Technology—New Generations (ITNG), and chronicles an annual event on state of the art technologies for digital information and communications. The application of advanced information technology to such domains as astronomy, biology, education, geosciences, security, and healthcare are among the themes explored by the ITNG proceedings. Visionary ideas, theoretical and experimental results, as well as prototypes, designs, and tools that help information flow to end users are of special interest. Specific topics include Machine Learning, Robotics, High Performance Computing, and Innovative Methods of Computing. The conference features keynote speakers; a best student contribution award, poster award, and service award; a technical open panel, and workshops/exhibits from industry, government, and academia.

Digital Interface Design and Application - Jonathan A. Dell
2015-06-26

Many computer applications require microprocessors to reliably interconnect and communicate with other peripherals in order to perform their intended functions. Interface design, which includes the development of the methods and processes by which two or more components communicate, is a crucial step in the deployment of microprocessors in an embedded computing environment. ARM-based microprocessors are a leading technology in this field, offering a wide range of performance for different applications. This book provides a comprehensive treatment of interface design from basic logical and theoretical principles to practical implementation on an ARM-based microprocessor, addressing both hardware and software considerations. The microprocessor's high level of complexity is carefully analysed in the text to provide clear guidance for the reader in the design of new applications, resulting in an invaluable reference resource for graduates and engineers involved in the design of electronic products and systems. Key Features: Brings together aspects of digital hardware, interface design and software integration in a single text to make clear the link between low and high level languages for interface control Categorises interface techniques into easily distinguished chapters, progressively involving greater complexity, enabling the reader to quickly find relevant material for a particular application Provides many practical C-coded examples showing both the preparation and use of complex programmable subsystems implemented in a typical commercial product Presents in each chapter an introduction to the essential theoretical aspects and the development of simple interface designs using basic logical building blocks

The Essentials of Computer Organization and Architecture - Linda Null
2014-02-14

Updated and revised, *The Essentials of Computer Organization and Architecture, Third Edition* is a comprehensive resource that addresses all of the necessary organization and architecture topics, yet is appropriate for the one-term course.

Designing Embedded Hardware - John Catsoulis 2002

Intelligent readers who want to build their own embedded computer systems-- installed in everything from cell phones to cars to handheld organizers to refrigerators-- will find this book to be the most in-depth, practical, and up-to-date guide on the market. *Designing Embedded Hardware* carefully steers between the practical and philosophical aspects, so developers can both create their own devices and gadgets and customize and extend off-the-shelf systems. There are hundreds of books to choose from if you need to learn programming, but only a few are available if you want to learn to create hardware. *Designing Embedded Hardware* provides software and hardware engineers with no prior experience in embedded systems with the necessary conceptual and design building blocks to understand the architectures of embedded

systems. Written to provide the depth of coverage and real-world examples developers need, *Designing Embedded Hardware* also provides a road-map to the pitfalls and traps to avoid in designing embedded systems. *Designing Embedded Hardware* covers such essential topics as: The principles of developing computer hardware Core hardware designs Assembly language concepts Parallel I/O Analog-digital conversion Timers (internal and external) UART Serial Peripheral Interface Inter-Integrated Circuit Bus Controller Area Network (CAN) Data Converter Interface (DCI) Low-power operation This invaluable and eminently useful book gives you the practical tools and skills to develop, build, and program your own application-specific computers.

Complete Digital Design: A Comprehensive Guide to Digital Electronics and Computer System Architecture - Mark Balch 2003-06-22

YOUR ONE-STOP RESOURCE FOR DIGITAL SYSTEM DESIGN! The explosion in communications and embedded computing technologies has brought with it a host of new skill requirements for electrical and electronics engineers, students, and hobbyists. With engineers expected to have such diverse expertise, they need comprehensive, easy-to-understand guidance on the fundamentals of digital design. Enter McGraw-Hill's *Complete Digital Design*. Written by an experienced electrical engineer and networking hardware designer, this book helps you understand and navigate the interlocking components, architectures, and practices necessary to design and implement digital systems. It includes: * Real world implementation of microprocessor-based digital systems * Broad presentation of supporting analog circuit principles * Building complete systems with basic design elements and the latest technologies *Complete Digital Design* will teach you how to develop a customized set of requirements for any design problem—and then research and evaluate available components and technologies to solve it. Perfect for the professional, the student, and the hobbyist alike, this is one volume you need handy at all times! What you'll find inside: * Digital logic and timing analysis * Integrated circuits * Microprocessor and computer architecture * Memory technologies * Networking and serial communications * Finite state machine design * Programmable logic: CPLD and FPGA * Analog circuit basics * Diodes, transistors, and operational amplifiers * Analog-to-digital conversion * Voltage regulation * Signal integrity and PCB design * And more!

ARM Assembly Language - William Hohl 2014-10-20

Delivering a solid introduction to assembly language and embedded systems, *ARM Assembly Language: Fundamentals and Techniques, Second Edition* continues to support the popular ARM7TDMI, but also addresses the latest architectures from ARM, including Cortex™-A, Cortex-R, and Cortex-M processors—all of which have slightly different instruction sets, programmer's models, and exception handling. Featuring three brand-new chapters, a new appendix, and expanded coverage of the ARM7™, this edition: Discusses IEEE 754 floating-point arithmetic and explains how to program with the IEEE standard notation Contains step-by-step directions for the use of Keil™ MDK-ARM and Texas Instruments (TI) Code Composer Studio™ Provides a resource to be used alongside a variety of hardware evaluation modules, such as TI's Tiva Launchpad, STMicroelectronics' iNemo and Discovery, and NXP Semiconductors' Xplorer boards Written by experienced ARM processor designers, *ARM Assembly Language: Fundamentals and Techniques, Second Edition* covers the topics essential to writing meaningful assembly programs, making it an ideal textbook and professional reference.

Mathematical Structures for Computer Science - Judith L. Gersting
2014-01-01

Judith Gersting's *Mathematical Structures for Computer Science* has long been acclaimed for its clear presentation of essential concepts and its exceptional range of applications relevant to computer science majors. Now with this new edition, it is the first discrete mathematics textbook revised to meet the proposed new ACM/IEEE standards for the course.

Computer Organization & Architecture 7e - Stallings 2008-02

Computer Architecture and Security - Shuangbao Paul Wang
2013-01-10

The first book to introduce computer architecture for security and provide the tools to implement secure computer systems This book provides the fundamentals of computer architecture for security. It covers a wide range of computer hardware, system software and data concepts from a security perspective. It is essential for computer science and security professionals to understand both hardware and software security solutions to survive in the workplace. Examination of memory,

CPU architecture and system implementation Discussion of computer buses and a dual-port bus interface Examples cover a board spectrum of hardware and software systems Design and implementation of a patent-pending secure computer system Includes the latest patent-pending technologies in architecture security Placement of computers in a security fulfilled network environment Co-authored by the inventor of the modern Computed Tomography (CT) scanner Provides website for lecture notes, security tools and latest updates

Digital Design with RTL Design, VHDL, and Verilog - Frank Vahid 2010-03-09

An eagerly anticipated, up-to-date guide to essential digital design fundamentals Offering a modern, updated approach to digital design, this much-needed book reviews basic design fundamentals before diving into specific details of design optimization. You begin with an examination of the low-levels of design, noting a clear distinction between design and gate-level minimization. The author then progresses to the key uses of digital design today, and how it is used to build high-performance alternatives to software. Offers a fresh, up-to-date approach to digital design, whereas most literature available is sorely outdated Progresses through low levels of design, making a clear distinction between design and gate-level minimization Addresses the various uses of digital design today Enables you to gain a clearer understanding of applying digital design to your life With this book by your side, you'll gain a better understanding of how to apply the material in the book to real-world scenarios.

Digital Design and Computer Architecture - Sarah Harris 2015-04-09

Digital Design and Computer Architecture: ARM Edition covers the fundamentals of digital logic design and reinforces logic concepts through the design of an ARM microprocessor. Combining an engaging and humorous writing style with an updated and hands-on approach to digital design, this book takes the reader from the fundamentals of digital logic to the actual design of an ARM processor. By the end of this book, readers will be able to build their own microprocessor and will have a top-to-bottom understanding of how it works. Beginning with digital logic gates and progressing to the design of combinational and sequential circuits, this book uses these fundamental building blocks as the basis for designing an ARM processor. SystemVerilog and VHDL are integrated throughout the text in examples illustrating the methods and techniques for CAD-based circuit design. The companion website includes a chapter on I/O systems with practical examples that show how to use the Raspberry Pi computer to communicate with peripheral devices such as LCDs, Bluetooth radios, and motors. This book will be a valuable resource for students taking a course that combines digital logic and computer architecture or students taking a two-quarter sequence in digital logic and computer organization/architecture. Covers the fundamentals of digital logic design and reinforces logic concepts through the design of an ARM microprocessor. Features side-by-side examples of the two most prominent Hardware Description Languages (HDLs)—SystemVerilog and VHDL—which illustrate and compare the ways each can be used in the design of digital systems. Includes examples throughout the text that enhance the reader's understanding and retention of key concepts and techniques. The Companion website includes a chapter on I/O systems with practical examples that show how to use the Raspberry Pi computer to communicate with peripheral devices such as LCDs, Bluetooth radios, and motors. The Companion website also includes appendices covering practical digital design issues and C programming as well as links to CAD tools, lecture slides, laboratory projects, and solutions to exercises.

Basic Computer Architecture - Smruti R. Sarangi 2021-09

This book is a comprehensive text on basic, undergraduate-level computer architecture. It starts from theoretical preliminaries and simple Boolean algebra. After a quick discussion on logic gates, it describes three classes of assembly languages: a custom RISC ISA called SimpleRisc, ARM, and x86. In the next part, a processor is designed for the SimpleRisc ISA from scratch. This includes the combinational units, ALUs, processor, basic 5-stage pipeline, and a microcode-based design. The last part of the book discusses caches, virtual memory, parallel programming, multiprocessors, storage devices and modern I/O systems. The book's website has links to slides for each chapter and video lectures hosted on YouTube.

Digital Logic Design and Computer Organization with Computer Architecture for Security - Nikrouz Faroughi 2014-09-08

A COMPREHENSIVE GUIDE TO THE DESIGN & ORGANIZATION OF MODERN COMPUTING SYSTEMS Digital Logic Design and Computer Organization with Computer Architecture for Security provides

practicing engineers and students with a clear understanding of computer hardware technologies. The fundamentals of digital logic design as well as the use of the Verilog hardware description language are discussed. The book covers computer organization and architecture, modern design concepts, and computer security through hardware. Techniques for designing both small and large combinational and sequential circuits are thoroughly explained. This detailed reference addresses memory technologies, CPU design and techniques to increase performance, microcomputer architecture, including "plug and play" device interface, and memory hierarchy. A chapter on security engineering methodology as it applies to computer architecture concludes the book. Sample problems, design examples, and detailed diagrams are provided throughout this practical resource. COVERAGE INCLUDES: Combinational circuits: small designs Combinational circuits: large designs Sequential circuits: core modules Sequential circuits: small designs Sequential circuits: large designs Memory Instruction set architecture Computer architecture: interconnection Memory system Computer architecture: security

Computers as Components - Wayne Wolf 2008-07-08

Computers as Components, Second Edition, updates the first book to bring essential knowledge on embedded systems technology and techniques under a single cover. This edition has been updated to the state-of-the-art by reworking and expanding performance analysis with more examples and exercises, and coverage of electronic systems now focuses on the latest applications. It gives a more comprehensive view of multiprocessors including VLIW and superscalar architectures as well as more detail about power consumption. There is also more advanced treatment of all the components of the system as well as in-depth coverage of networks, reconfigurable systems, hardware-software co-design, security, and program analysis. It presents an updated discussion of current industry development software including Linux and Windows CE. The new edition's case studies cover SHARC DSP with the TI C5000 and C6000 series, and real-world applications such as DVD players and cell phones. Researchers, students, and savvy professionals schooled in hardware or software design, will value Wayne Wolf's integrated engineering design approach. * Uses real processors (ARM processor and TI C55x DSP) to demonstrate both technology and techniques...Shows readers how to apply principles to actual design practice. * Covers all necessary topics with emphasis on actual design practice...Realistic introduction to the state-of-the-art for both students and practitioners. * Stresses necessary fundamentals which can be applied to evolving technologies...helps readers gain facility to design large, complex embedded systems that actually work.

A Book on C - Al Kelley 1990

The authors provide clear examples and thorough explanations of every feature in the C language. They teach C vis-a-vis the UNIX operating system. A reference and tutorial to the C programming language.

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New Perspectives Microsoft Office 365 & Excel 2016: Intermediate - June Jamrich Parsons 2016-01-15

Now readers can develop the Microsoft Excel 2016 skills needed to be successful in college or the business world beyond with the emphasis on critical-thinking, problem-solving, and in-depth coverage found in NEW PERSPECTIVES MICROSOFT OFFICE 365 & EXCEL 2016:

INTERMEDIATE. Updated with all-new case scenarios, this complete book clearly applies the skills readers are learning to real-world situations, making the concepts even more relevant. All content and activities throughout NEW PERSPECTIVES MICROSOFT OFFICE 365 & EXCEL 2016: INTERMEDIATE help readers understand the importance of what they're learning. This edition focuses on strengthening learning outcomes and transferring skills to other applications and disciplines for further success. Important Notice: Media content referenced within the product description or the product text may not be available in the ebook version.

STRUCTURED COMPUTER ORGANIZATION - 1996

Architecting High-Performance Embedded Systems - Jim Ledin 2021-02-05

Explore the complete process of developing systems based on field-programmable gate arrays (FPGAs), including the design of electronic circuits and the construction and debugging of prototype embedded devices Key Features Learn the basics of embedded systems and real-time operating systems Understand how FPGAs implement processing algorithms in hardware Design, construct, and debug custom digital systems from scratch using KiCad Book Description Modern digital

devices used in homes, cars, and wearables contain highly sophisticated computing capabilities composed of embedded systems that generate, receive, and process digital data streams at rates up to multiple gigabits per second. This book will show you how to use Field Programmable Gate Arrays (FPGAs) and high-speed digital circuit design to create your own cutting-edge digital systems. *Architecting High-Performance Embedded Systems* takes you through the fundamental concepts of embedded systems, including real-time operation and the Internet of Things (IoT), and the architecture and capabilities of the latest generation of FPGAs. Using powerful free tools for FPGA design and electronic circuit design, you'll learn how to design, build, test, and debug high-performance FPGA-based IoT devices. The book will also help you get up to speed with embedded system design, circuit design, hardware construction, firmware development, and debugging to produce a high-performance embedded device - a network-based digital oscilloscope. You'll explore techniques such as designing four-layer printed circuit boards with high-speed differential signal pairs and assembling the board using surface-mount components. By the end of the book, you'll have a solid understanding of the concepts underlying embedded systems and FPGAs and will be able to design and construct your own sophisticated digital devices. What you will learn

Understand the fundamentals of real-time embedded systems and sensors
Discover the capabilities of FPGAs and how to use FPGA development tools
Learn the principles of digital circuit design and PCB layout with KiCad
Construct high-speed circuit board prototypes at low cost
Design and develop high-performance algorithms for FPGAs
Develop robust, reliable, and efficient firmware in C
Thoroughly test and debug embedded device hardware and firmware
Who this book is for
This book is for software developers, IoT engineers, and anyone who wants to understand the process of developing high-performance embedded systems. You'll also find this book useful if you want to learn about the fundamentals of FPGA development and all aspects of firmware development in C and C++.

Computer Systems - Ata Elahi 2017-11-16

This textbook covers digital design, fundamentals of computer architecture, and assembly language. The book starts by introducing basic number systems, character coding, basic knowledge in digital design, and components of a computer. The book goes on to discuss information representation in computing; Boolean algebra and logic gates; sequential logic; input/output; and CPU performance. The author also covers ARM architecture, ARM instructions and ARM assembly language which is used in a variety of devices such as cell phones, digital TV, automobiles, routers, and switches. The book contains a set of laboratory experiments related to digital design using Logisim software; in addition, each chapter features objectives, summaries, key terms, review questions and problems. The book is targeted to students majoring Computer Science, Information System and IT and follows the ACM/IEEE 2013 guidelines. • Comprehensive textbook covering digital design, computer architecture, and ARM architecture and assembly • Covers basic number system and coding, basic knowledge in digital design, and components of a computer • Features laboratory exercises in addition to objectives, summaries, key terms, review questions, and problems in each chapter

ARM System Developer's Guide - Andrew Sloss 2004-05-10

Over the last ten years, the ARM architecture has become one of the most pervasive architectures in the world, with more than 2 billion ARM-based processors embedded in products ranging from cell phones to automotive braking systems. A world-wide community of ARM developers in semiconductor and product design companies includes software developers, system designers and hardware engineers. To date no book has directly addressed their need to develop the system and software for an ARM-based system. This text fills that gap. This book provides a comprehensive description of the operation of the ARM core from a developer's perspective with a clear emphasis on software. It demonstrates not only how to write efficient ARM software in C and assembly but also how to optimize code. Example code throughout the book can be integrated into commercial products or used as templates to enable quick creation of productive software. The book covers both the ARM and Thumb instruction sets, covers Intel's XScale Processors, outlines distinctions among the versions of the ARM architecture, demonstrates how to implement DSP algorithms, explains exception and interrupt handling, describes the cache technologies that surround the ARM cores as well as the most efficient memory management techniques. A final chapter looks forward to the future of the ARM

architecture considering ARMv6, the latest change to the instruction set, which has been designed to improve the DSP and media processing capabilities of the architecture. * No other book describes the ARM core from a system and software perspective. * Author team combines extensive ARM software engineering experience with an in-depth knowledge of ARM developer needs. * Practical, executable code is fully explained in the book and available on the publisher's Website. * Includes a simple embedded operating system.

Computer Systems - Ata Elahi 2017-11-08

This textbook covers digital design, fundamentals of computer architecture, and assembly language. The book starts by introducing basic number systems, character coding, basic knowledge in digital design, and components of a computer. The book goes on to discuss information representation in computing; Boolean algebra and logic gates; sequential logic; input/output; and CPU performance. The author also covers ARM architecture, ARM instructions and ARM assembly language which is used in a variety of devices such as cell phones, digital TV, automobiles, routers, and switches. The book contains a set of laboratory experiments related to digital design using Logisim software; in addition, each chapter features objectives, summaries, key terms, review questions and problems. The book is targeted to students majoring Computer Science, Information System and IT and follows the ACM/IEEE 2013 guidelines. • Comprehensive textbook covering digital design, computer architecture, and ARM architecture and assembly • Covers basic number system and coding, basic knowledge in digital design, and components of a computer • Features laboratory exercises in addition to objectives, summaries, key terms, review questions, and problems in each chapter

Verilog for Digital Design Set - Frank Vahid 2006-12

Computer Systems - Ata Elahi 2022

This updated textbook covers digital design, fundamentals of computer architecture, and ARM assembly language. The book starts by introducing computer abstraction, basic number systems, character coding, basic knowledge in digital design, and components of a computer. The book goes on to discuss information representation in computing, Boolean algebra and logic gates, and sequential logic. The book also presents introduction to computer architecture, Cache mapping methods, and virtual memory. The author also covers ARM architecture, ARM instructions, ARM assembly language using Keil development tools, and bitwise control structure using C and ARM assembly language. The book includes a set of laboratory experiments related to digital design using Logisim software and ARM assembly language programming using Keil development tools. In addition, each chapter features objectives, summaries, key terms, review questions, and problems.

Inside the Machine - Jon Stokes 2007

Om hvordan mikroprocessorer fungerer, med undersøgelse af de nyeste mikroprocessorer fra Intel, IBM og Motorola.

Learning Computer Architecture with Raspberry Pi - Eben Upton 2016-09-13

Use your Raspberry Pi to get smart about computing fundamentals In the 1980s, the tech revolution was kickstarted by a flood of relatively inexpensive, highly programmable computers like the Commodore. Now, a second revolution in computing is beginning with the Raspberry Pi. *Learning Computer Architecture with the Raspberry Pi* is the premier guide to understanding the components of the most exciting tech product available. Thanks to this book, every Raspberry Pi owner can understand how the computer works and how to access all of its hardware and software capabilities. Now, students, hackers, and casual users alike can discover how computers work with *Learning Computer Architecture with the Raspberry Pi*. This book explains what each and every hardware component does, how they relate to one another, and how they correspond to the components of other computing systems. You'll also learn how programming works and how the operating system relates to the Raspberry Pi's physical components. Co-authored by Eben Upton, one of the creators of the Raspberry Pi, this is a companion volume to the *Raspberry Pi User Guide* An affordable solution for learning about computer system design considerations and experimenting with low-level programming Understandable descriptions of the functions of memory storage, Ethernet, cameras, processors, and more Gain knowledge of computer design and operation in general by exploring the basic structure of the Raspberry Pi The Raspberry Pi was created to bring forth a new generation of computer scientists, developers, and architects who understand the inner workings of the computers that have become

essential to our daily lives. Learning Computer Architecture with the Raspberry Pi is your gateway to the world of computer system design.

HDL with Digital Design - Nazeih M. Botros 2015

This book introduces the latest version of hardware description languages and explains how the languages can be implemented in the design of the digital logic components. In addition to digital design, other examples in the areas of bioengineering and basic computer design are covered. Unlike the competition, HDL with Digital Design introduces mixed language programming. By covering both Verilog and VHDL side by side, students, as well as professionals, can learn both the theoretical and practical concepts of digital design. The two languages are equally important in the field of computer engineering and computer science as well as other engineering fields such as simulation and modeling.

Computer Architecture - John L. Hennessy 2017-11-23

Computer Architecture: A Quantitative Approach, Sixth Edition has been considered essential reading by instructors, students and practitioners of computer design for over 20 years. The sixth edition of this classic textbook from Hennessy and Patterson, winners of the 2017 ACM A.M. Turing Award recognizing contributions of lasting and major technical importance to the computing field, is fully revised with the latest developments in processor and system architecture. The text now features examples from the RISC-V (RISC Five) instruction set architecture, a modern RISC instruction set developed and designed to be a free and openly adoptable standard. It also includes a new chapter on domain-specific architectures and an updated chapter on warehouse-scale computing that features the first public information on Google's newest WSC. True to its original mission of demystifying computer architecture, this edition continues the longstanding tradition of focusing on areas where the most exciting computing innovation is happening, while always keeping an emphasis on good engineering design. Winner of a 2019 Textbook Excellence Award (Texty) from the Textbook and Academic Authors Association Includes a new chapter on domain-specific architectures, explaining how they are the only path forward for improved performance and energy efficiency given the end of Moore's Law and Dennard scaling Features the first publication of several DSAs from industry Features extensive updates to the chapter on warehouse-scale computing, with the first public information on the newest Google WSC Offers updates to other chapters including new material dealing with the use of stacked DRAM; data on the performance of new NVIDIA Pascal GPU vs. new AVX-512 Intel Skylake CPU; and extensive additions to content covering multicore architecture and organization Includes "Putting It All Together" sections near the end of every chapter, providing real-world technology examples that demonstrate the principles covered in each chapter Includes review appendices in the printed text and additional reference appendices available online Includes updated and improved case studies and exercises ACM named John L. Hennessy and David A. Patterson, recipients of the 2017 ACM A.M. Turing Award for pioneering a systematic, quantitative approach to the design and evaluation of computer architectures with enduring impact on the microprocessor industry

Computer Organization and Design - John L. Hennessy 1998

The performance of software systems is dramatically affected by how well software designers understand the basic hardware technologies at work in a system. Similarly, hardware designers must understand the far-reaching effects their design decisions have on software applications. For readers in either category, this classic introduction to the field provides a look deep into the computer. It demonstrates the relationships between the software and hardware and focuses on the foundational concepts that are the basis for current computer design.

Computer Organization, Design, and Architecture, Fifth Edition - Sajjan G. Shiva 2013-12-20

Suitable for a one- or two-semester undergraduate or beginning graduate course in computer science and computer engineering, *Computer Organization, Design, and Architecture, Fifth Edition* presents the operating principles, capabilities, and limitations of digital computers to enable the development of complex yet efficient systems. With 11 new sections and four revised sections, this edition takes students through a solid, up-to-date exploration of single- and multiple-processor systems, embedded architectures, and performance evaluation. See What's New in the Fifth Edition Expanded coverage of embedded systems, mobile processors, and cloud computing Material for the "Architecture and Organization" part of the 2013 IEEE/ACM Draft Curricula for Computer

Science and Engineering Updated commercial machine architecture examples The backbone of the book is a description of the complete design of a simple but complete hypothetical computer. The author then details the architectural features of contemporary computer systems (selected from Intel, MIPS, ARM, Motorola, Cray and various microcontrollers, etc.) as enhancements to the structure of the simple computer. He also introduces performance enhancements and advanced architectures including networks, distributed systems, GRIDs, and cloud computing. Computer organization deals with providing just enough details on the operation of the computer system for sophisticated users and programmers. Often, books on digital systems' architecture fall into four categories: logic design, computer organization, hardware design, and system architecture. This book captures the important attributes of these four categories to present a comprehensive text that includes pertinent hardware, software, and system aspects.

Microprocessor Theory and Applications with 68000/68020 and Pentium - M. Rafiquzzaman 2008-09-22

MICROPROCESSOR THEORY AND APPLICATIONS WITH 68000/68020 AND PENTIUM A SELF-CONTAINED INTRODUCTION TO MICROPROCESSOR THEORY AND APPLICATIONS This book presents the fundamental concepts of assembly language programming and system design associated with typical microprocessors, such as the Motorola MC68000/68020 and Intel® Pentium®. It begins with an overview of microprocessors—including an explanation of terms, the evolution of the microprocessor, and typical applications—and goes on to systematically cover: Microcomputer architecture Microprocessor memory organization Microprocessor Input/Output (I/O) Microprocessor programming concepts Assembly language programming with the 68000 68000 hardware and interfacing Assembly language programming with the 68020 68020 hardware and interfacing Assembly language programming with Pentium Pentium hardware and interfacing The author assumes a background in basic digital logic, and all chapters conclude with a Questions and Problems section, with selected answers provided at the back of the book. Microprocessor Theory and Applications with 68000/68020 and Pentium is an ideal textbook for undergraduate- and graduate-level courses in electrical engineering, computer engineering, and computer science. (An instructor's manual is available upon request.) It is also appropriate for practitioners in microprocessor system design who are looking for simplified explanations and clear examples on the subject. Additionally, the accompanying Website, which contains step-by-step procedures for installing and using Ide 68k21 (68000/68020) and MASM32 / Olly Debugger (Pentium) software, provides valuable simulation results via screen shots.

Probability and Stochastic Processes - Roy D. Yates 2014-01-28

This text introduces engineering students to probability theory and stochastic processes. Along with thorough mathematical development of the subject, the book presents intuitive explanations of key points in order to give students the insights they need to apply math to practical engineering problems. The first seven chapters contain the core material that is essential to any introductory course. In one-semester undergraduate courses, instructors can select material from the remaining chapters to meet their individual goals. Graduate courses can cover all chapters in one semester.

Computer Organization and Design RISC-V Edition - David A. Patterson 2017-05-12

The new RISC-V Edition of *Computer Organization and Design* features the RISC-V open source instruction set architecture, the first open source architecture designed to be used in modern computing environments such as cloud computing, mobile devices, and other embedded systems. With the post-PC era now upon us, *Computer Organization and Design* moves forward to explore this generational change with examples, exercises, and material highlighting the emergence of mobile computing and the Cloud. Updated content featuring tablet computers, Cloud infrastructure, and the x86 (cloud computing) and ARM (mobile computing devices) architectures is included. An online companion Web site provides advanced content for further study, appendices, glossary, references, and recommended reading. Features RISC-V, the first such architecture designed to be used in modern computing environments, such as cloud computing, mobile devices, and other embedded systems Includes relevant examples, exercises, and material highlighting the emergence of mobile computing and the cloud