

Digital Design And Computer Architecture Arm Edition

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Digital Signal Processing Using Arm Cortex-M Based Microcontrollers - Cem Ünsalan 2018-12-12

This textbook introduces readers to digital signal processing fundamentals using Arm Cortex-M based microcontrollers as demonstrator platforms. It covers foundational concepts, principles and techniques such as signals and systems, sampling, reconstruction and anti-aliasing, FIR and IIR filter design, transforms, and adaptive signal processing.

Computer Systems - Ata Elahi 2022-03-16

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.

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.

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.

The Elements of Computing Systems - Noam Nisan 2008

This title gives students an integrated and rigorous picture of applied computer science, as it comes to play in the construction of a simple yet powerful computer system.

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.

Definitive Guide to Arm Cortex-M23 and Cortex-M33 Processors - Joseph Yiu 2020-12-01

The Definitive Guide to Arm® Cortex®-M23 and Cortex-M33 Processors focuses on the Armv8-M architecture and the features that are available in the Cortex-M23 and Cortex-M33 processors. This book covers a range of topics, including the instruction set, the programmer's model, interrupt handling, OS support, and debug features. It demonstrates how to create software for the Cortex-M23 and Cortex-M33 processors by way of a range of examples, which will enable embedded software developers to understand the Armv8-M architecture. This book also covers the TrustZone® technology in detail, including how it benefits security in IoT applications, its operations, how the technology affects the processor's hardware (e.g., memory architecture, interrupt handling, etc.), and various other considerations in creating secure

software. Presents the first book on Armv8-M Architecture and its features as implemented in the Cortex-M23 and Cortex-M33 processors Covers TrustZone technology in detail Includes examples showing how to create software for Cortex-M23/M33 processors

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"--

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.

Hardware and Computer Organization - Arnold S. Berger 2005-06-08

Hardware and Computer Organization is a practical introduction to the architecture of modern microprocessors. This book from the bestselling author explains how PCs work and how to make them work for you. It is designed to take students "under the hood" of a PC and provide them with an understanding of the complex machine that has become such a pervasive part of everyday life. It clearly explains how hardware and software cooperatively interact to accomplish real-world tasks. Unlike other textbooks on this topic, Dr. Berger's book takes the software developer's point-of-view. Instead of simply demonstrating how to design a computer's hardware, it provides an understanding of the total machine, highlighting strengths and weaknesses, explaining how to deal with memory and how to write efficient assembly code that interacts directly with, and takes best advantage of the underlying hardware. The book is divided into three major sections: Part 1 covers hardware and computer fundamentals, including logical gates and simple digital design. Elements of hardware development such as instruction set architecture, memory and I/O organization and analog to digital conversion are examined in detail, within the context of modern operating systems. Part 2 discusses the software at the lowest level, assembly language, while Part 3 introduces the reader to modern computer architectures and reflects on future trends in reconfigurable hardware. This book is an ideal reference for ECE/software engineering students as well as embedded systems designers, professional engineers needing to understand the fundamentals of computer hardware, and hobbyists. The renowned author's many years in industry provide an excellent basis for the inclusion of extensive real-world references and insights Several modern processor architectures are covered, with examples taken from each, including Intel, Motorola, MIPS, and ARM

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.

Computer Architecture Tutorial Using an FPGA - Robert Dunne 2020-07-23

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.

Programming Rust - Jim Blandy 2017-11-21

Rust is a new systems programming language that combines the performance and low-level control of C and C++ with memory safety and thread safety. Rust's modern, flexible types ensure your program is free of null pointer dereferences, double frees, dangling pointers, and similar bugs, all at compile time, without runtime overhead. In multi-threaded code, Rust catches data races at compile time, making concurrency much easier to use. Written by two experienced systems programmers, this book explains how Rust manages to bridge the gap between performance and safety, and how you can take advantage of it. Topics include: How Rust represents values in memory (with diagrams) Complete explanations of ownership, moves, borrows, and lifetimes Cargo, rustdoc, unit tests, and how to publish your code on crates.io, Rust's public package repository High-level features like generic code, closures, collections, and iterators that make Rust productive and flexible Concurrency in Rust: threads, mutexes, channels, and atomics, all much safer to use than in C or C++ Unsafe code, and how to preserve the integrity of ordinary code that uses it Extended examples illustrating how pieces of the language fit together

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.

Modern Computer Architecture and Organization - Jim Ledin 2022-05-04

A no-nonsense, practical guide to current and future processor and computer architectures that enables you to design computer systems and develop better software applications across a variety of domains Key

Features • Understand digital circuitry through the study of transistors, logic gates, and sequential logic • Learn the architecture of x86, x64, ARM, and RISC-V processors, iPhones, and high-performance gaming PCs • Study the design principles underlying the domains of cybersecurity, bitcoin, and self-driving cars
Book Description Are you a software developer, systems designer, or computer architecture student looking for a methodical introduction to digital device architectures, but are overwhelmed by the complexity of modern systems? This step-by-step guide will teach you how modern computer systems work with the help of practical examples and exercises. You'll gain insights into the internal behavior of processors down to the circuit level and will understand how the hardware executes code developed in high-level languages. This book will teach you the fundamentals of computer systems including transistors, logic gates, sequential logic, and instruction pipelines. 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 write a quantum computing program and run it on an actual quantum computer. This edition has been updated to cover the architecture and design principles underlying the important domains of cybersecurity, blockchain and bitcoin mining, and self-driving vehicles. By the end of this book, you will have a thorough understanding of modern processors and computer architecture and the future directions these technologies are likely to take. What you will learn • Understand the fundamentals of transistor technology and digital circuits • Explore the concepts underlying pipelining and superscalar processing • Implement a complete RISC-V processor in a low-cost FPGA • Understand the technology used to implement virtual machines • Learn about security-critical computing applications like financial transaction processing • Get up to speed with blockchain and the hardware architectures used in bitcoin mining • Explore the capabilities of self-navigating vehicle computing architectures • Write a quantum computing program and run it on a real 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: ranging from tiny, embedded devices to warehouse-size cloud server farms. A general understanding of computer processors is helpful but not required.

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.

Digital Design and Computer Architecture - Sarah Harris 2021-08-17

The newest addition to the Harris and Harris family of *Digital Design and Computer Architecture* books, this RISC-V Edition covers the fundamentals of digital logic design and reinforces logic concepts through the design of a RISC-V 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 a processor. By the end of this book, readers will be able to build their own RISC-V 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 a RISC-V 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 SparkFun's RED-V RedBoard 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 a RISC-V microprocessor Gives students a full understanding of the RISC-V instruction set architecture, enabling them to build a RISC-V processor and program the RISC-V processor in hardware simulation, software simulation, and in hardware Includes both SystemVerilog and VHDL designs of fundamental building blocks as well as of single-cycle, multicycle, and pipelined versions of the RISC-V architecture Features a companion website with a bonus chapter on I/O systems with practical

examples that show how to use SparkFun's RED-V RedBoard 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 See the companion EdX MOOCs ENGR85A and ENGR85B with video lectures and interactive problems

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.

System-on-Chip Design with Arm® Cortex®-M Processors - Joseph Yiu 2019-08-29

The Arm(R) Cortex(R)-M processors are already one of the most popular choices for IoT and embedded applications. With Arm Flexible Access and DesignStart(TM), accessing Arm Cortex-M processor IP is fast, affordable, and easy. This book introduces all the key topics that system-on-chip (SoC) and FPGA designers need to know when integrating a Cortex-M processor into their design, including bus protocols, bus interconnect, and peripheral designs. Joseph Yiu is a distinguished Arm engineer who began designing SoCs back in 2000 and has been a leader in this field for nearly twenty years. Joseph's book takes an expert look at what SoC designers need to know when incorporating Cortex-M processors into their systems. He discusses the on-chip bus protocol specifications (AMBA, AHB, and APB), used by Arm processors and a wide range of on-chip digital components such as memory interfaces, peripherals, and debug components. Software development and advanced design considerations are also covered. The journey concludes with 'Putting the system together', a designer's eye view of a simple microcontroller-like design based on the Cortex-M3 processor (DesignStart) that uses the components that you will have learned to create.

Digital Design and Computer Architecture - David Maney Harris 2007

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

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 CortexTM-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 ARM7TM, 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 KeilTM MDK-ARM and Texas Instruments (TI) Code Composer StudioTM 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.

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 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

Digital Design and Computer Architecture(ARM Edition) - Sarah L. Harris 2016-12

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 Organization & Architecture 7e - Stallings 2008-02

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 Design and Computer Architecture - David Money Harris 2015

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 Inside the Machine - Jon Stokes 2007

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

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++. Familiarity with the C language, digital circuits, and electronic soldering is necessary to get started.

STRUCTURED COMPUTER ORGANIZATION - 1996

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.

The Architecture of Computer Hardware, Systems Software, and Networking - Irv Englander 2021-04-06

The Architecture of Computer Hardware, Systems Software and Networking is designed help students majoring in information technology (IT) and information systems (IS) understand the structure and operation of computers and computer-based devices. Requiring only basic computer skills, this accessible textbook introduces the basic principles of system architecture and explores current technological practices and trends using clear, easy-to-understand language. Throughout the text, numerous relatable examples, subject-specific illustrations, and in-depth case studies reinforce key learning points and show students how important concepts are applied in the real world. This fully-updated sixth edition features a wealth of new and revised content that reflects today's technological landscape. Organized into five parts, the book first explains the role of the computer in information systems and provides an overview of its components. Subsequent sections discuss the representation of data in the computer, hardware architecture and operational concepts, the basics of computer networking, system software and operating systems, and various interconnected systems and components. Students are introduced to the material using ideas already familiar to them, allowing them to gradually build upon what they have learned without being overwhelmed and develop a deeper knowledge of computer architecture.

Computer Organization and Design - David A. Patterson 2004-08-07

This best selling text on computer organization has been thoroughly updated to reflect the newest technologies. Examples highlight the latest processor designs, benchmarking standards, languages and tools. As with previous editions, a MIPS processor is the core used to present the fundamentals of hardware technologies at work in a computer system. The book presents an entire MIPS instruction set—instruction by instruction—the fundamentals of assembly language, computer arithmetic, pipelining, memory

hierarchies and I/O. A new aspect of the third edition is the explicit connection between program performance and CPU performance. The authors show how hardware and software components—such as the specific algorithm, programming language, compiler, ISA and processor implementation—impact program performance. Throughout the book a new feature focusing on program performance describes how to search for bottlenecks and improve performance in various parts of the system. The book digs deeper into the hardware/software interface, presenting a complete view of the function of the programming language and compiler—crucial for understanding computer organization. A CD provides a toolkit of simulators and compilers along with tutorials for using them. For instructor resources click on the grey "companion site" button found on the right side of this page. This new edition represents a major revision. New to this edition: * Entire Text has been updated to reflect new technology * 70% new exercises. * Includes a CD loaded with software, projects and exercises to support courses using a number of tools * A new interior design presents defined terms in the margin for quick reference * A new feature, "Understanding Program Performance" focuses on performance from the programmer's perspective * Two sets of exercises and solutions, "For More Practice" and "In More Depth," are included on the CD * "Check Yourself" questions help students check their understanding of major concepts * "Computers In the Real World" feature illustrates the diversity of uses for information technology * More detail below...

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

Digital Design - M. Morris Mano 2013

For courses on digital design in an Electrical Engineering, Computer Engineering, or Computer Science department. Digital Design, fifth edition is a modern update of the classic authoritative text on digital design. This book teaches the basic concepts of digital design in a clear, accessible manner. The book presents the basic tools for the design of digital circuits and provides procedures suitable for a variety of digital applications.

