



A comprehensive guide for students and practitioners to parallel computing models, processes, metrics, and implementation in MPI and OpenMP.

Taking an integrated approach, this book addresses the great diversity of areas that a computer professional must know. Exposes the inner workings of the modern digital computer at a level that demystifies what goes on inside the machine. Focuses on the instruction set architecture (ISA), the coverage of network-related topics, and the programming methodology. Each topic is discussed in the context of the entire machine and how the implementation affects behavior. Describes network architectures, focusing on both local area networks and ...

Information Technology: An Introduction for Today's Digital World introduces undergraduate students to a wide variety of concepts they will encounter throughout their IT studies and careers. The book covers computer organization and hardware, Windows and Linux operating systems, system administration duties, scripting, computer networks, regular expressions, binary numbers, the Bash shell in Linux, DOS, managing processes and services, and computer security. It also gives students insight on IT-related careers, such as network and web administration, computer forensics, web development, and software engineering. Suitable for any introductory IT course, this classroom-tested text presents many of the topics recommended by the ACM Special Interest Group on IT Education (SIGITE). It offers a far more detailed examination of the computer than current computer literacy texts, focusing on concepts essential to all IT professionals—from operating systems and hardware to information security and computer ethics. The book highlights Windows/DOS and Linux with numerous examples of issuing commands and controlling the operating systems. It also provides details on hardware, programming, and computer networks. Ancillary Resources The book includes laboratory exercises and some of the figures from the text online. PowerPoint lecture slides, answers to exercises, and a test bank are also available for instructors.

This textbook introduces a concise approach to the design of molecular algorithms for students or researchers who are interested in dealing with complex problems. Through numerous examples and exercises, you will understand the main difference of molecular circuits and traditional digital circuits to manipulate the same problem and you will also learn how to design a molecular algorithm of solving any a problem from start to finish. The book starts with an introduction to computational aspects of digital computers and molecular computing, data representation of molecular computing, molecular operations of molecular computing and number representation of molecular computing and provides many molecular algorithm to construct the parity generator and the parity checker of error-detection codes on digital communication, to encode integers of different formats, single precision and double precision of floating-point numbers, to implement addition and subtraction of unsigned integers, to construct logic operations including NOT, OR, AND, NOR, NAND, Exclusive-OR (XOR) and Exclusive-NOR (XNOR), to implement comparators, shifters, increase, decrease, and to complete two specific operations that are to find the maximum number of "1" and to find the minimum number of "1". The book is also a useful reference source to people new for the field of molecular computing.

A True Textbook for an Introductory Course, System Administration Course, or a Combination Course Linux with Operating System Concepts merges conceptual operating system (OS) and Unix/Linux topics into one cohesive textbook for undergraduate students. The book can be used for a one- or two-semester course on Linux or Unix. It is complete with review sections, problems, definitions, concepts, and relevant introductory material, such as binary and Boolean logic, OS kernels, and the role of the CPU and memory hierarchy. Details for Introductory and Advanced Users The book covers Linux from both the user and system administrator positions. From a user perspective, it emphasizes command line interaction. From a system administrator perspective, the text reinforces shell scripting with examples of administration scripts that support the automation of administrator tasks. Thorough Coverage of Concepts and Linux Commands The author incorporates OS concepts not found in most Linux/Unix textbooks, including kernels, file systems, storage devices, virtual memory, and process management. He also introduces computer science topics, such as computer networks and TCP/IP, binary numbers and Boolean logic, encryption, and the GNUs C compiler. In addition, the text discusses disaster recovery planning, booting, and Internet servers.

Embedded Systems: A Contemporary Design Tool, Second Edition Embedded systems are one of the foundational elements of today's evolving and growing computer technology. From operating our cars, managing our smart phones, cleaning our homes, or cooking our meals, the special computers we call embedded systems are quietly and unobtrusively making our lives easier, safer, and more connected. While working in increasingly challenging environments, embedded systems give us the ability to put increasing amounts of capability into ever-smaller and more powerful devices. Embedded Systems: A Contemporary Design Tool, Second Edition introduces you to the theoretical hardware and software foundations of these systems and expands into the areas of signal integrity, system security, low power, and hardware-software co-design. The text builds upon earlier material to show you how to apply reliable, robust solutions to a wide range of applications operating in today's often challenging environments. Taking the user's problem and needs as your starting point, you will explore each of the key theoretical and practical issues to consider when designing an application in today's world. Author James Peckol walks you through the formal hardware and software development process covering: Breaking the problem down into major functional blocks; Planning the digital and software architecture of the system; Utilizing the hardware and software co-design process; Designing the physical world interface to external analog and digital signals; Addressing security issues as an integral part of the design process; Managing signal integrity problems and reducing power demands in contemporary systems; Debugging and testing throughout the design and development cycle; Improving performance. Stressing the importance of security, safety, and reliability in the design and development of embedded systems and providing a balanced treatment of both the hardware and the software aspects, Embedded Systems: A Contemporary Design Tool, Second Edition gives you the tools for creating embedded designs that solve contemporary real-world challenges.

Future computing professionals must become familiar with historical computer architectures because many of the same or similar techniques are still being used and may persist well into the future. Computer Architecture: Fundamentals and Principles of Computer Design discusses the fundamental principles of computer design and performance enhancement that have proven effective and demonstrates how current trends in architecture and implementation rely on these principles while expanding upon them or applying them in new ways. Rather than focusing on a particular type of machine, this textbook explains concepts and techniques via examples drawn from various architectures and implementations. When necessary, the author creates simplified examples that clearly explain architectural and implementation features used across many computing platforms. Following an introduction that discusses the difference between architecture and implementation and how they relate, the next four chapters cover the architecture of traditional, single-processor systems that are still, after 60 years, the most widely used computing machines. The final two chapters explore approaches to adopt when single-processor systems do not reach desired levels of performance or are not suited for intended applications. Topics include parallel systems, major classifications of architectures, and characteristics of unconventional systems of the past, present, and future. This textbook provides students with a thorough grounding in what constitutes high performance and how to measure it, as well as a full familiarity in the fundamentals needed to make systems perform better. This knowledge enables them to understand and evaluate the many new systems they will encounter throughout their professional careers. This is the eBook of the printed book and may not include any media, website access codes, or print supplements that may come packaged with the bound book. Essentials of Computer Architecture is ideal for undergraduate courses in computer architecture and organization. Douglas Comer takes a clear, concise approach to computer architecture that readers love. By exploring the fundamental concepts from a programmer's perspective and explaining programming consequences, this unique text covers exactly the material students need to understand and construct efficient and correct programs for modern hardware.

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

