Principles of Cyber-Physical Systems

A foundational text that offers a rigorous introduction to the principles of design, specification, modeling, and analysis of cyber-physical systems. A cyber-physical system consists of a collection of computing devices communicating with one another and interacting with the physical world via sensors and actuators in a feedback loop. Increasingly, such systems are everywhere, from smart buildings to medical devices to automobiles. This textbook offers a rigorous and comprehensive introduction to the principles of design, specification, modeling, and analysis of cyber-physical systems. The book draws on a diverse set of subdisciplines, including model-based design, concurrency theory, distributed algorithms, formal methods of specification and verification, control theory, real-time systems, and hybrid systems, explaining the core ideas from each that are relevant to system design and analysis. The book explains how formal models provide mathematical abstractions to manage the complexity of a system design. It covers both synchronous and asynchronous models for concurrent computation, continuous-time models for dynamical systems, and hybrid systems for integrating discrete and continuous evolution. The role of correctness requirements in the design of reliable systems is illustrated with a range of specification formalisms and the associated techniques for formal verification. The topics include safety and liveness requirements, temporal logic, model checking, deductive verification, stability analysis of linear systems, and real-time scheduling algorithms. Principles of modeling, specification, and analysis are illustrated by constructing solutions to representative design problems from distributed algorithms, network protocols, control design, and robotics. This book provides the rapidly expanding field of cyber-physical systems with a long-needed foundational text by an established authority. It is suitable for classroom use or as a reference for professionals.

Early Software Reliability Prediction

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

**Computer System Architecture**

The first book to provide a comprehensive overview of the subject rather than a collection of papers. The author is a recognized authority in the field as well as an outstanding teacher lauded for his ability to convey these concepts clearly to many different audiences. A handy reference for practitioners in the field.

**Soft Real-Time Systems: Predictability vs. Efficiency**

**Real-Time Systems**

This is the digital version of the printed book (Copyright © 1987). Here is a casebook, a practical reference, and an indispensable guide for creating a systematic, formal methodology for large, real-time, software-based systems. The book introduces the widely implemented Hatley/Pirbhai methods, a major extension of the DeMarco analysis method describing how external events control the system's operating behavior. The techniques are used in major avionics and electronics companies worldwide, and are automated by most major CASE tools, including TurboCASE/Sys by StructSoft, Inc. Large software-based systems, especially those for real-time applications, require multi-mode operation, direct interaction with a rapidly changing physical environment, and fast response times. In the past, the development of such systems was prone to massive cost and schedule overruns, and to inadequate performance and reliability. Strategies for Real-Time System Specification addresses these problems by integrating a finite-state machine structure into classical analysis methods. The book contains nearly 200 diagrams, many of which illustrate the requirements specification of a flight management system for a major avionics developer.

**Real-Time Systems**

Learn how to rapidly build your own ecommerce site by applying Django’s battle-tested components. This book demonstrates Django’s features and conventions to help you develop modern web applications quickly. You'll adopt a "learn by doing" approach and gain a deeper understanding Django by working through a project in which the real-time component will be critical. The book starts with the basics and explains the difference between a Django project and a Django app, the most important settings, how to change them, and the fundamentals of packaging. You'll then be introduced to all the standard tools of Django, along with a sample project. The book then moves on to Channels, a recent addition to the Django ecosystem. It extends the framework with support for real-time operations such as Websockets and other asynchronous features. Practical Django 2 and Channels 2 provides the practical concepts needed to create complex, database-driven websites as easily as possible. What You'll Learn Build and deploy a simple company site with Django Develop more complex, data-heavy sites using the Django ORM Integrate Django with Channels Unit-test your solutions Who This Book Is For Python developers and web developers wanting to learn Django 2 and Channels 2

**Proceedings of 3rd International Conference on Advanced Computing, Networking and Informatics**

**Fundamentals of Software Engineering**

**FUNDAMENTALS OF MOBILE COMPUTING, Second Edition**

**Real-time Systems and Their Programming Languages**
Construct a robust end-to-end solution for analyzing and visualizing streaming data. Real-time analytics is the hottest topic in data analytics today. In Real-Time Analytics: Techniques to Analyze and Visualize Streaming Data, expert Byron Ellis teaches data analysts technologies to build an effective real-time analytics platform. This platform can then be used to make sense of the constantly changing data that is beginning to outpace traditional batch-based analysis platforms. The author is among a very few leading experts in the field. He has a prestigious background in research, development, analytics, real-time visualization, and Big Data streaming and is uniquely qualified to help you explore this revolutionary field. Moving from a description of the overall analytic architecture of real-time analytics to using specific tools to obtain targeted results, Real-Time Analytics leverages open source and modern commercial tools to construct robust, efficient systems that can provide real-time analysis in a cost-effective manner. The book includes:

- A deep discussion of streaming data systems and architectures
- Instructions for analyzing, storing, and delivering streaming data
- Tips on aggregating data and working with sets
- Information on data warehousing options and techniques

Real-Time Analytics includes in-depth case studies for website analytics, Big Data, visualizing streaming and mobile data, and mining and visualizing operational data flows. The book’s "recipe" layout lets readers quickly learn and implement different techniques. All of the code examples presented in the book, along with their related data sets, are available on the companion website.

**Real Time Systems**

Seeking to capture the essence of the current state of research in active media technology, this volume identifies the changes and opportunities - both current and future - in the field. The papers are taken from the Second International Conference on Active Media Technology, held in China in 2003. Researchers such as Professor Ning Zhong from the Maebashi Institute of Technology, Professor John Yen from the Pennsylvania State University, and Professor Sanker K. Pal from the Indian Statistical Institute present their research papers.

**Strategies for Real-Time System Specification**

Modern embedded systems require high performance, low cost and low power consumption. Such systems typically consist of a heterogeneous collection of processors, specialized memory subsystems, and partially programmable or fixed-function components. This heterogeneity, coupled with issues such as hardware/software partitioning, mapping, scheduling, etc., leads to a large number of design possibilities, making performance debugging and validation of such systems a difficult problem. Embedded systems are used to control safety critical applications such as flight control, automotive electronics and healthcare monitoring. Clearly, developing reliable software/systems for such applications is of utmost importance. This book describes a host of debugging and verification methods which can help to achieve this goal. Covers the major abstraction levels of embedded systems design, starting from software analysis and micro-architectural modeling, to modeling of resource sharing and communication at the system level. Integrates formal techniques of validation for hardware/software with debugging and validation of embedded system design flows. Includes practical case studies to answer the questions: does a design meet its requirements, if not, then which parts of the system are responsible for the violation, and once they are identified, then how should the design be suitably modified?

**Active Media Technology**

Location-based Services (LBSs) are mobile services for providing information that has been created, compiled, selected or filtered under consideration of the users’ current locations or those of other persons or mobile devices. Typical examples are restaurant finders, buddy trackers, navigation services or applications in the areas of mobile marketing and mobile gaming. The attractiveness of LBSs is due to the fact that users are not required to enter location information manually but are automatically pinpointed and tracked. This book explains the fundamentals and operation of LBSs and gives a thorough introduction to the key technologies and organizational procedures, offering comprehensive coverage of positioning methods, location protocols and service platforms, alongside an overview of interfaces, languages, APIs and middleware with examples demonstrating their usage. Explanation and comparison of all protocols and architectures for location services in-depth coverage of satellite, cellular and local positioning. All embracing introduction to 3GPP.
positioning methods, such as Cell-Id, E-OTD, U-TdoA, OTDoA-IPDL and Assisted GPS. Explains the operation of enhanced emergency services such as E-911. Identifies unsolved research issues and challenges in the area of LBSs. This comprehensive guide will be invaluable to undergraduate and postgraduate students and lecturers in the area of telecommunications. It will also be a useful resource to developers and researchers seeking to expand their knowledge in this field.

**Software Project Management**

The Unified Modeling Language has become the industry standard for the expression of software designs. The Java programming language continues to grow in popularity as the language of choice for the serious application developer. Using UML and Java together would appear to be a natural marriage, one that can produce considerable benefit. However, there are nuances that the seasoned developer needs to keep in mind when using UML and Java together. Software expert Robert Martin presents a concise guide, with numerous examples, that will help the programmer leverage the power of both development concepts. The author ignores features of UML that do not apply to java programmers, saving the reader time and effort. He provides direct guidance and points the reader to real-world usage scenarios. The overall practical approach of this book brings key information related to Java to the many presentations. The result is an highly practical guide to using the UML with Java.

**FUNDAMENTALS OF SOFTWARE ENGINEERING, FIFTH EDITION**

In 2000, total sales of software in the U.S. reached $180 billion. Reducing the cost of software development and improving software quality are important objectives of the U.S. software industry. However, the complexity of the underlying software needed to support the U.S.'s computerized economy is increasing at an alarming rate. Software nonperformance and failure are expensive, but it is difficult to define and measure software quality. The objective of this study is to investigate the economic impact of an inadequate infrastructure for software testing in the U.S. This study was undertaken as part of joint planning between NIST and industry to help identify and assess technical needs that would improve the industry's software testing capabilities. Illustrated.

**PANKAJ JALOTE'S SOFTWARE ENGINEERING: A PRECISE APPROACH**

Master the techniques needed to build great, efficient embedded devices on Linux. About This Book Discover how to build and configure reliable embedded Linux devices. This book has been updated to include Linux 4.9 and Yocto Project 2.2 (Morty). This comprehensive guide covers the remote update of devices in the field and power management. Who This Book Is For If you are an engineer who wishes to understand and use Linux in embedded devices, this book is for you. It is also for Linux developers and system programmers who are familiar with embedded systems and want to learn and program the best in class devices. It is appropriate for students studying embedded techniques, for developers implementing embedded Linux devices, and engineers supporting existing Linux devices. What You Will Learn Evaluate the Board Support Packages offered by most manufacturers of a system on chip or embedded module. Use Buildroot and the Yocto Project to create embedded Linux systems quickly and efficiently. Update IoT devices in the field without compromising security. Reduce the power budget of devices to make batteries last longer. Interact with the hardware without having to write kernel device drivers. Debug devices remotely using GDB, and see how to measure the performance of the systems using powerful tools such as perf, ftrace, and valgrind. Find out how to configure Linux as a real-time operating system. In Detail Embedded Linux runs many of the devices we use every day, from smart TVs to WiFi routers, test equipment to industrial controllers - all of them have Linux at their heart. Linux is a core technology in the implementation of the inter-connected world of the Internet of Things. The comprehensive guide shows you the technologies and techniques required to build Linux into embedded systems. You will begin by learning about the fundamental elements that underpin all embedded Linux projects: the toolchain, the bootloader, the kernel, and the root filesystem. You'll see how to create each of these elements from scratch, and how to automate the process using Buildroot and the Yocto Project. Moving on, you'll find out how to implement an effective storage strategy for flash memory chips, and how to install updates to the device remotely once it is deployed. You'll also get to know the key aspects of writing code for embedded Linux, such as how to access hardware from applications, the implications of writing multi-threaded code, and techniques to manage memory in an efficient
way. The final chapters show you how to debug your code, both in applications and in the Linux kernel, and how to profile the system so that you can look out for performance bottlenecks. By the end of the book, you will have a complete overview of the steps required to create a successful embedded Linux system. Style and approach This book is an easy-to-follow and pragmatic guide with in-depth analysis of the implementation of embedded devices. It follows the life cycle of a project from inception through to completion, at each stage giving both the theory that underlies the topic and practical step-by-step walkthroughs of an example implementation.

**Embedded Systems Architecture**

In this text performance measures, scheduling, real-time architectures, and algorithms are treated, along with fault-tolerance technology. With "Real-Time Systems", students will gain a deeper insight into the material through the use of numerous exercises and examples. For instance, simple examples found in Chapter 2 illustrate the differences between real-time and non-real-time systems.

**Fundamentals of Software Engineering**

Concurrency provides a thoroughly updated approach to the basic concepts and techniques behind concurrent programming. Concurrent programming is complex and demands a much more formal approach than sequential programming. In order to develop a thorough understanding of the topic Magee and Kramer present concepts, techniques and problems through a variety of forms: informal descriptions, illustrative examples, abstract models and concrete Java examples. These combine to provide problem patterns and associated solution techniques which enable students to recognise problems and arrive at solutions. New features include: New chapters covering program verification and logical properties. More student exercises. Supporting website contains an updated version of the LTSA tool for modelling concurrency, model animation, and model checking. Website also includes the full set of state models, java examples, and demonstration programs and a comprehensive set of overhead slides for course presentation.

**Real-Time Systems**

Embedded Systems: An Integrated Approach is exclusively designed for the undergraduate courses in electronics and communication engineering as well as computer science engineering. This book is well-structured and covers all the important processors and their applications in a sequential manner. It begins with a highlight on the building blocks of the embedded systems, moves on to discuss the software aspects and new processors and finally concludes with an insightful study of important applications. This book also contains an entire part dedicated to the ARM processor, its software requirements and the programming languages. Relevant case studies and examples supplement the main discussions in the text.

**Journal of the Indian Institute of Science**

Embedded Systems Architecture is a practical and technical guide to understanding the components that make up an embedded system’s architecture. This book is perfect for those starting out as technical professionals such as engineers, programmers and designers of embedded systems; and also for students of computer science, computer engineering and electrical engineering. It gives a much-needed ‘big picture’ for recently graduated engineers grappling with understanding the design of real-world systems for the first time, and provides professionals with a systems-level picture of the key elements that can go into an embedded design, providing a firm foundation on which to build their skills. Real-world approach to the fundamentals, as well as the design and architecture process, makes this book a popular reference for the daunted or the inexperienced: if in doubt, the answer is in here! Fully updated with new coverage of FPGAs, testing, middleware and the latest programming techniques in C, plus complete source code and sample code, reference designs and tools online make this the complete package Visit the companion web site at http://booksite.elsevier.com/9780123821966/ for source code, design examples, data sheets and more A true introductory book, provides a comprehensive get up and running reference for those new to the field, and updating skills: assumes no prior knowledge beyond undergrad level electrical engineering Addresses the needs of practicing engineers,
enabling it to get to the point more directly, and cover more ground. Covers hardware, software and middleware in a single volume. Includes a library of design examples and design tools, plus a complete set of source code and embedded systems design tutorial materials from companion website.

**Embedded Systems: An Integrated Approach**

Today’s advancements in technology have brought about a new era of speed and simplicity for consumers and businesses. Due to these new benefits, the possibilities of universal connectivity, storage and computation are made tangible, thus leading the way to new Internet-of Things solutions. Resource Management and Efficiency in Cloud Computing Environments is an authoritative reference source for the latest scholarly research on the emerging trends of cloud computing and reveals the benefits cloud paths provide to consumers. Featuring coverage across a range of relevant perspectives and topics, such as big data, cloud security, and utility computing, this publication is an essential source for researchers, students and professionals seeking current research on the organization and productivity of cloud computing environments.

**Location-Based Services**

This book is intended to provide a senior undergraduate or graduate student in electrical engineering or computer science with a balance of fundamental theory, review of industry practice, and hands-on experience to prepare for a career in the real-time embedded system industries. It is also intended to provide the practicing engineer with the necessary background to apply real-time theory to the design of embedded components and systems. Typical industries include aerospace, medical diagnostic and therapeutic systems, telecommunications, automotive, robotics, industrial process control, media systems, computer gaming, and electronic entertainment, as well as multimedia applications for general-purpose computing. This updated edition adds three new chapters focused on key technology advancements in embedded systems and with wider coverage of real-time architectures. The overall focus remains the RTOS (Real-Time Operating System), but use of Linux for soft real-time, hybrid FPGA (Field Programmable Gate Array) architectures and advancements in multi-core system-on-chip (SoC), as well as software strategies for asymmetric and symmetric multiprocessing (AMP and SMP) relevant to real-time embedded systems, have been added. Companion files are provided with numerous project videos, resources, applications, and figures from the book. Instructors’ resources are available upon adoption. FEATURES: • Provides a comprehensive, up to date, and accessible presentation of embedded systems without sacrificing theoretical foundations • Features the RTOS (Real-Time Operating System), but use of Linux for soft real-time, hybrid FPGA architectures and advancements in multi-core system-on-chip is included • Discusses an overview of RTOS advancements, including AMP and SMP configurations, with a discussion of future directions for RTOS use in multi-core architectures, such as SoC • Detailed applications coverage including robotics, computer vision, and continuous media • Includes a companion disc (4GB) with numerous videos, resources, projects, examples, and figures from the book • Provides several instructors’ resources, including lecture notes, Microsoft PP slides, etc.

**Electronics - Circuits and Systems**

**Practical Django 2 and Channels 2**

A survey of real-time systems and the programming languages used in their development. Shows how modern real-time programming techniques are used in a wide variety of applications, including robotics, factory automation, and control. A critical requirement for such systems is that the software must

**Computer Science and Informatics**

Contributed papers presented at a national conference organized by the School of Computer and Systems Sciences, Jawaharlal Nehru University, New Delhi.

**Embedded System Design**
Computer Network Simulation Using NS2

Hard real-time systems are very predictable, but not sufficiently flexible to adapt to dynamic situations. They are built under pessimistic assumptions to cope with worst-case scenarios, so they often waste resources. Soft real-time systems are built to reduce resource consumption, tolerate overloads and adapt to system changes. They are also more suited to novel applications of real-time technology, such as multimedia systems, monitoring apparatuses, telecommunication networks, mobile robotics, virtual reality, and interactive computer games. This unique monograph provides concrete methods for building flexible, predictable soft real-time systems, in order to optimize resources and reduce costs. It is an invaluable reference for developers, as well as researchers and students in Computer Science.

Embedded Systems and Software Validation

This new edition of the book, is restructured to trace the advancements made and landmarks achieved in software engineering. The text not only incorporates latest and enhanced software engineering techniques and practices, but also shows how these techniques are applied into the practical software assignments. The chapters are incorporated with illustrative examples to add an analytical insight on the subject. The book is logically organised to cover expanded and revised treatment of all software process activities. KEY FEATURES • Large number of worked-out examples and practice problems • Chapter-end exercises and solutions to selected problems to check students’ comprehension on the subject • Solutions manual available for instructors who are confirmed adopters of the text • PowerPoint slides available online at www.phindia.com/rajibmall to provide integrated learning to the students NEW TO THE FIFTH EDITION • Several rewritten sections in almost every chapter to increase readability • New topics on latest developments, such as agile development using SCRUM, MC/DC testing, quality models, etc. • A large number of additional multiple choice questions and review questions in all the chapters help students to understand the important concepts TARGET AUDIENCE • BE/B.Tech (CS and IT) • BCA/MCA • M.Sc. (CS) • MBA

Software Testing and Quality Assurance

First Published in 2010. Routledge is an imprint of Taylor & Francis, an informa company.

The Economic Impacts of Inadequate Infrastructure for Software Testing

The development of software system with acceptable level of reliability and quality within available time frame and budget becomes a challenging objective. This objective could be achieved to some extent through early prediction of number of faults present in the software, which reduces the cost of development as it provides an opportunity to make early corrections during development process. The book presents an early software reliability prediction model that will help to grow the reliability of the software systems by monitoring it in each development phase, i.e. from requirement phase to testing phase. Different approaches are discussed in this book to tackle this challenging issue. An important approach presented in this book is a model to classify the modules into two categories (a) fault-prone and (b) not fault-prone. The methods presented in this book for assessing expected number of faults present in the software, assessing expected number of faults present at the end of each phase and classification of software modules in fault-prone or no fault-prone category are easy to understand, develop and use for any practitioner. The practitioners are expected to gain more information about their development process and product reliability, which can help to optimize the resources used.

Concurrency

This book introduces a modern approach to embedded system design, presenting software design and hardware design in a unified manner. It covers trends and challenges, introduces the design and use of single-purpose processors ("hardware") and general-purpose processors ("software"), describes memories and buses, illustrates hardware/software tradeoffs using a digital camera example, and discusses advanced computation models, controls systems, chip technologies, and modern design tools. For courses found in EE, CS and other engineering departments.
Proceedings of National Conference on Methods and Models in Computing

Computer Network Simulations Using NS2 provides a solid foundation of computer networking knowledge and skills, covering everything from simple operating system commands to the analysis of complex network performance metrics. The book begins with a discussion of the evolution of data communication techniques and the fundamental issues associated with performance evaluation. After presenting a preliminary overview of simulation and other performance evaluation techniques, the authors: Describe a number of computer network protocols and TCP/IP and OSI models, highlighting the networking devices used Explain a socket and its use in network programming, fostering the development of network applications using C and socket API Introduce the NS2 network simulator, exhibiting its internal architecture, constituent software packages, and installation in different operating systems Delve into simulation using NS2, elaborating on the use of Tcl and OTcl scripts as well as AWK scripting and plotting with Gnuplot Show how to simulate wired and wireless network protocols step by step, layer by layer Explore the idea of simulating very large networks, identifying the challenges associated with measuring and graphing the various network parameters Include nearly 90 example programs, scripts, and outputs, along with several exercises requiring application of the theory and programming Computer Network Simulations Using NS2 emphasizes the implementation and simulation of real-world computer network protocols, affording readers with valuable opportunities for hands-on practice while instilling a deeper understanding of how computer network protocols work.

Mastering Embedded Linux Programming

Provides coverage of fundamentals of software engineering by stressing principles and methods through formal and informal approaches. This book emphasizes, identifies, and applies fundamental principles that are applicable throughout the software lifecycle, in contrast to other texts which are based in the lifecycle model of software development.

EMBEDDED SYSTEM DESIGN

UML for Java Programmers

Operating System (A Practical App)

For the Students of B.E. / B.Tech., M.E. / M.Tech. & BCA / MCA It is indeed a matter of great encouragement to write the Third Edition of this book on ‘Operating Systems - A Practical Approach’ which covers the syllabi of B.Tech./B.E. (CSE/IT), M.Tech./M.E. (CSE/IT), BCA/MCA of many universities of India like Delhi University, GGSIPU Delhi, UPTU Lucknow, WBUT, RGPV, MDU, etc.

Real-time Systems

Embedded system, as a subject, is an amalgamation of different domains, such as digital design, architecture, operating systems, interfaces, and algorithmic optimization techniques. This book acquaints the students with the alternatives and intricacies of embedded system design. It is designed as a textbook for the undergraduate students of Electronics and Communication Engineering, Electronics and Instrumentation Engineering, Computer Science and Engineering, Information Communication Technology (ICT), as well as for the postgraduate students of Computer Applications (MCA). While in the hardware platform the book explains the role of microcontrollers and introduces one of the most widely used embedded processor, ARM, it also deliberates on other alternatives, such as digital signal processors, field programmable devices, and integrated circuits. It provides a very good overview of the interfacing standards covering RS232C, RS422, RS485, USB, IrDA, Bluetooth, and CAN. In the software domain, the book introduces the features of real-time operating systems for use in embedded applications. Various scheduling algorithms have been discussed with their merits and demerits. The existing real-time operating systems have been surveyed. Guided by cost and performance requirements, embedded applications are often implemented partly in hardware and partly in software. The book covers the different optimization techniques proposed in the literature to take a judicious decision about this partitioning of
application tasks. Power-aware design of embedded systems has also been dealt with. In its second edition, the text has been extensively revised and updated. Almost all the chapters have been modified and elaborated including detailed discussion on hardware platforms—ARM, DSP, and FPGA. The chapter on “interfacing standards” has been updated to incorporate the latest information. The new edition will be thereby immensely useful to the students, practitioners and advanced readers. Key Features • Presents a considerably wide coverage of the field of embedded systems • Discusses the ARM microcontroller in detail • Provides numerous exercises to assess the learning process • Offers a good discussion on hardware-software codesign

**Real-Time Analytics**

Advanced Computing, Networking and Informatics are three distinct and mutually exclusive disciplines of knowledge with no apparent sharing/overlap among them. However, their convergence is observed in many real world applications, including cyber-security, internet banking, healthcare, sensor networks, cognitive radio, pervasive computing amidst many others. This two volume proceedings explore the combined use of Advanced Computing and Informatics in the next generation wireless networks and security, signal and image processing, ontology and human-computer interfaces (HCI). The two volumes together include 132 scholarly articles, which have been accepted for presentation from over 550 submissions in the Third International Conference on Advanced Computing, Networking and Informatics, 2015, held in Bhubaneswar, India during June 23–25, 2015.

**Real-Time Embedded Components and Systems with Linux and RTOS**

The goal of this book is to introduce to the students a limited number of concepts and practices which will achieve the following two objectives: Teach the student the skills needed to execute a smallish commercial project. Provide the students necessary conceptual background for undertaking advanced studies in software engineering, through organized courses or on their own. This book focuses on key tasks in two dimensions - engineering and project management - and discusses concepts and techniques that can be applied to effectively execute these tasks. The book is organized in a simple manner, with one chapter for each of the key tasks in a project. For engineering, these tasks are requirements analysis and specification, architecture design, module level design, coding and unit testing, and testing. For project management, the key tasks are project planning and project monitoring and control, but both are discussed together in one chapter on project planning as even monitoring has to be planned. In addition, one chapter clearly defines the problem domain of Software Engineering, and another Chapter discusses the central concept of software process which integrates the different tasks executed in a project. Each chapter opens with some introduction and clearly lists the chapter goals, or what the reader can expect to learn from the chapter. For the task covered in the chapter, the important concepts are first discussed, followed by a discussion of the output of the task, the desired quality properties of the output, and some practical methods and notations for performing the task. The explanations are supported by examples, and the key learnings are summarized in the end for the reader. The chapter ends with some self-assessment exercises. Finally, the book contains a question bank at the end which lists out questions with answers from major universities.

**Resource Management and Efficiency in Cloud Computing Environments**

This textbook, now in its Second Edition, addresses the rapid advancements to the area of mobile computing. Almost every chapter has been revised to make the book up to date with the latest developments. It covers the main topics associated with mobile computing and wireless networking at a level that enables the students to develop a fundamental understanding of the technical issues involved in this new and fast emerging discipline. This book first examines the basics of wireless technologies and computer communications that form the essential infrastructure required for building knowledge in the area of mobile computations involving the study of invocation mechanisms at the client end, the underlying wireless communication, and the corresponding server-side technologies. It includes coverage of development of mobile cellular systems, protocol design for mobile networks, special issues involved in the mobility management of cellular system users, realization and applications of mobile ad hoc networks (MANETs), design and operation of sensor networks, special constraints and requirements of mobile operating systems, and
development of mobile computing applications. Finally, an example application of the mobile computing infrastructure to M-commerce is described in the concluding chapter of the book. The book is suitable for a one-semester course in mobile computing for the undergraduate students of Computer Science and Engineering, Information Technology, Electronics and Communication Engineering, Master of Computer Applications (MCA), and the undergraduate and postgraduate science courses in computer science and Information Technology. Key Features • Provides unified coverage of mobile computing and communication aspects • Discusses the mobile application development, mobile operating systems and mobile databases as part of the material devoted to mobile computing • Incorporates a survey of mobile operating systems and the latest developments

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