Architecting Software Intensive Systems A Practitioners Guide

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The Executive MBA for Engineers and Scientists James J. Farley 2009-12-01 All too often, a simple lack of understanding of fundamental business concepts is enough to prevent capable scientists and engineers from receiving otherwise deserved promotions. These days, technical merit and hard work alone no longer guarantee upward mobility. For scientists and engineers with aspirations of moving up the corporate ladder a keen grasp of business basics is a must. Presenting concepts in a manner that is easily accessible, The Executive MBA for Engineers and Scientists covers the business principles and applications that today's technical managers need to know. The book touches upon all the essentials, including marketing, sales, finance, manufacturing, and accounting. It details technical considerations including quality control, technical services, and R & D and highlights how to effectively integrate business concepts with technical considerations. Examples based on the author's experience working in the pharmaceutical industry and with the Food and Drug Administration illustrate how similar situations can occur in other industries and explain how to solve the problems using the same techniques. This easy-reading reference not only facilitates the understanding required of today's technical professional but also provides a time-saving reference for business men and women on the move upward in sales, marketing, and manufacturing who need to expand their knowledge of technical functions. From break-even analysis to technical quality control, this practical guide arms you with the business savvy required to walk into your next meeting with confidence and walk out with an increased sense of accomplishment.

Digital Transformation of Enterprise Architecture Vivek Kale 2019-07-08 "In this book, Vivek Kale makes an important contribution to the theory and practice of enterprise architecture ... this book captures the breadth and depth of information that a modern enterprise architecture must address to effectively support an agile enterprise. This book should have a place in

every practicing architect's library." —John D. McDowall, Author of Complex Enterprise Architecture Digital Transformation of Enterprise Architecture is the first book to propose Enterprise Architecture (EA) as the most important element (after Business Models) for digital transformation of enterprises. This book makes digital transformation more tangible by showing the rationale and typical technologies associated with it, and these technologies in turn reveal the essence of digital transformation. This book would be useful for analysts, designers and developers of future-ready agile application systems. This book proposes that it is the perennial quest for interoperability & portability, scalability, availability, etc., that has directed and driven the evolution of the IT/IS industry in the past 50 years. It is this very quest that has led to the emergence of technologies like service-oriented, cloud, and big data computing. In addition to the conventional attributes of EA like interoperability, scalability and availability, this book identifies additional attributes of mobility, ubiquity, security, analyticity, and usability. This pragmatic book: Identifies three parts effort for any digital transformation: Business Models, Enterprise Architectures and Enterprise Processes. Describes eight attributes of EA: interoperability, scalability, availability, mobility, ubiquity, security, analyticity, and usability. Explains the corresponding technologies of service-oriented, cloud, big data, context-aware, Internet of Things (IoT), blockchain, soft, and interactive computing. Briefs on auxiliary technologies like integration, virtualization, replication, spatio-temporal databases, embedded systems, cryptography, data mining, and interactive interfaces that are essential for digital transformation of enterprise architecture. Introduces interactive interfaces like voice, gaze, gesture and 3D interfaces. Provides an overview of blockchain computing, soft computing, and customer interaction systems. Digital Transformation of Enterprise Architecture proposes that to withstand the disruptive digital storms of the future, enterprises must bring about digital transformation, i.e. a transformation that affects an exponential change (amplification or attenuation) in any aspect of the constituent attributes of EA. It proposes that each of these technologies (service-oriented, cloud, big data, context-aware, IoT, blockchain, soft, and interactive computing) bring about digital transformation of the corresponding EA attribute viz. interoperability, scalability, availability, mobility, ubiquity, security, analyticity, and usability.

Advanced Research on Biologically Inspired Cognitive Architectures Vallverdú, Jordi 2017-01-25 There are many different approaches to understanding human consciousness. By conducting research to better understand various biological mechanisms, these can be redefined and utilized for technological purposes. Advanced Research on Biologically Inspired Cognitive Architectures is an essential reference source for the latest scholarly research on the biological elements of human cognition and examines the applications of consciousness within computing environments. Featuring exhaustive coverage on a broad range of innovative topics and perspectives, such as artificial intelligence, bio-robotics, and human-computer interaction, this publication is ideally designed for academics, researchers, professionals, graduate students, and practitioners seeking current research on the exploration of the intricacies of consciousness and different approaches of perception.

Solar Cell Technology and Applications A. R. Jha 2009-10-14 Energy experts predict that wholesale electricity prices could easily rise 35 to 65 percent by 2015. Add to this the growing need for energy independence and the need to reduce carbon emissions and it is very clear that the development of low-cost renewable energy, such as solar energy, is essential for our economy and our national security. With t

Future-Proof Software-Systems Frank J. Furrer 2019-09-25 This book focuses on software architecture and the value of architecture in the development of long-lived, mission-critical,

trustworthy software-systems. The author introduces and demonstrates the powerful strategy of “Managed Evolution,” along with the engineering best practice known as “Principle-based Architecting.” The book examines in detail architecture principles for e.g., Business Value, Changeability, Resilience, and Dependability. The author argues that the software development community has a strong responsibility to produce and operate useful, dependable, and trustworthy software. Software should at the same time provide business value and guarantee many quality-of-service properties, including security, safety, performance, and integrity. As Dr. Furrer states, “Producing dependable software is a balancing act between investing in the implementation of business functionality and investing in the quality-of-service properties of the software-systems.” The book presents extensive coverage of such concepts as: Principle-Based Architecting Managed Evolution Strategy The Future Principles for Business Value Legacy Software Modernization/Migration Architecture Principles for Changeability Architecture Principles for Resilience Architecture Principles for Dependability The text is supplemented with numerous figures, tables, examples and illustrative quotations. Future-Proof Software-Systems provides a set of good engineering practices, devised for integration into most software development processes dedicated to the creation of software-systems that incorporate Managed Evolution.

Software Technologies Enrique Cabello 2017-07-11 This book constitutes the thoroughly refereed proceedings of the 11th International Joint Conference on Software Technologies, ICSOFT 2016, held in Lisbon, Portugal, in July 2016. The 13 revised full papers together with 3 short papers presented were carefully reviewed and selected from 84 submissions. The papers selected to be included in this book contribute to the understanding of relevant trends of current research on software technologies, including: Modelling for mobile devices Software and system testing Model-driven software development Reengineering systems for multi-tenancy Embedded and real-time systems reconguration Domain-specic languages and modelling Software and systems quality Context-aware and dynamically adapting software systems

Software Project Management Ashfaque Ahmed 2016-04-19 To build reliable, industry-applicable software products, large-scale software project groups must continuously improve software engineering processes to increase product quality, facilitate cost reductions, and adhere to tight schedules. Emphasizing the critical components of successful large-scale software projects, Software Project Management: A

Mobile Evolution Sebastian Thalanany 2015-03-02 This book presents insights, interpretations, concepts, and interdependent views-in the landscape of mobile connectivity and service-that emphasize the significance of a harmonious interplay, cooperation, and coalescing of a variety of interdisciplinary domains of science and art.Mobile Evolution: Insights on Connectivity and Service explores the f

Introduction to Communications Technologies Stephan Jones 2015-07-28 Thanks to the advancement of faster processors within communication devices, there has been a rapid change in how information is modulated, multiplexed, managed, and moved. While formulas and functions are critical in creating the granular components and operations of individual technologies, understanding the applications and their purposes in the

Mobile Enterprise Transition and Management Bhuvan Unhelkar 2009-06-25 Coupled with the Internet, mobile technology is rapidly moving us from the information age into the age of boundless communication. However, the success of today’s cutting-edge mobile technologies will not be determined merely by their new features. Rather, the way in which you integrate these technologies into your day-to-day business operations that will determine their success or failure. While there is substantial literature on mobility and business transitions, this book not only

brings the two together but also provides a formal process for transitioning your organization from a fix-wired electronic organization to an enhanced mobile enterprise with minimal disruptions to daily operations. Addressing the rapid evolution of global communications, Mobile Enterprise Transition and Management provides step-by-step guidance on how to configure, enact, and manage the process of integrating mobile technology within your organization. The mobile enterprise transition (MET) process presented considers input from the four significant dimensions of an organization economic, technical, process, and social making it a well-rounded and complete process. The Material Presented in This Book Forms the Basis of the Popular Workshop Designed and Led by a Leading Expert in the Field Based on extensive research, literature review, and practical experimentation in METs, this comprehensive text presents emerging best practices, exhaustive case studies, and examples of successful transitions. It also provides detailed references, and a glossary of key terms and commonly used acronyms. Whether you are an engineer, network manager, business manager, or other decision maker, this book will show you how to develop customized integration strategies that will set your enterprise on the path to achieving the competitive advantages today's mobile innovations make possible.

Implementing Program Management Ginger Levin 2009-10-05 In early 2007, the Project Management Institute (PMI) piloted the now highly sought after Program Management Professional (PgMP) credential, reflecting the growing trend for organizations to coordinate the work done on numerous stand-alone projects into a cohesive program-type structure. Written by two successful PgMPs, Implementing Program Managem

Agile Enterprise Engineering: Smart Application of Human Factors Sergey V. Zykov 2020-02-27 This concise book provides a survival toolkit for efficient, large-scale software development. Discussing a multi-contextual research framework that aims to harness human-related factors in order to improve flexibility, it includes a carefully selected blend of models, methods, practices, and case studies. To investigate mission-critical communication aspects in system engineering, it also examines diverse, i.e. cross-cultural and multinational, environments. This book helps students better organize their knowledge bases, and presents conceptual frameworks, handy practices and case-based examples of agile development in diverse environments. Together with the authors' previous books, "Crisis Management for Software Development and Knowledge Transfer" (2016) and "Managing Software Crisis: A Smart Way to Enterprise Agility" (2018), it constitutes a comprehensive reference resource adds value to this book.

Architecting Software Intensive Systems Anthony J. Lattanze 2008-11-18 Architectural design is a crucial first step in developing complex software intensive systems. Early design decisions establish the structures necessary for achieving broad systemic properties. However, today's organizations lack synergy between software their development processes and technological methodologies. Providing a thorough treatment of the latest theory and best practices, Architecting Software Intensive Systems: A Practitioner's Guide explains: How and when to design architectures How to weave architecture design processes into existing development processes What to do with architecture design artifacts once created The first section establishes key concepts in architectural design for software intensive systems, including architectural drivers, structures, and fundamental guidance for architectural design. The book goes on to describe the industry tested Architecture Centric Design Method. Each stage of the method is explained and the book provides all of the supporting templates and checklists. The last section discusses practical matters, including how to adopt disciplined architectural design practices into existing organizational development processes. With the principled understanding of

design provided by this book, architects can temper their visceral instinct to react and be better prepared to address a broader range of design problems regardless of business context or their domain experience.

Wireless Network Performance Enhancement via Directional Antennas: Models, Protocols, and Systems John D. Matyjas 2015-11-18 Directional antenna technologies have made significant advancements in the last decade. These advances have opened the door to many exciting new design opportunities for wireless networks to enhance quality of service (QoS), performance, and network capacity. In this book, experts from around the world present the latest research and development in wireless networks with directional antennas. Their contributed chapters provide detailed coverage of the models, algorithms, protocols, and applications of wireless networks with various types of directional antennas operating at different frequency bands. Wireless Network Performance Enhancement via Directional Antennas: Models, Protocols, and Systems identifies several interesting research problems in this important field, providing an opportunity to learn about solid solutions to these issues. It also looks at a number of practical hardware designs for the deployment of next-generation antennas, as well as efficient network protocols for exploitation of directional communications. The book is organized into six sections: Directional Antennas – covers the hardware design of different types of antennas Directional MAC – focuses on the principles of designing medium access control (MAC) protocols for directional networks Millimeter Wave – explores different design aspects of millimeter wave (mm-Wave) systems, which operate in higher-frequency bands (such as 60 GHz) MIMO – explains how to establish a multiple-input, multiple-output (MIMO) antenna system and describes how it operates in a cognitive radio network Advanced Topics – looks at additional topics such as beamforming in cognitive radio networks, multicast algorithm development, network topology management for connectivity, and sensor network lifetime issues Applications – illustrates some important applications, such as military networks and airborne networking, that benefit from directional networking designs With this book, researchers and engineers will be well-equipped to advance the research and development in this important field. If you're new to this field, you will find this book to be a valuable reference on basic directional networking principles, engineering design, and challenges.

Advanced Methodologies and Technologies in Government and Society Khosrow-Pour, D.B.A., Mehdi 2018-11-02 Governments must continuously update policies, laws, and legislation as the world continues to rapidly evolve due to technologies and changing cultural perspectives. To streamline policy creation and implementation, governments seek new and efficient methods to ensure their citizens' and communities' safety while also encouraging citizen participation. Advanced Methodologies and Technologies in Government and Society provides research on emerging methodologies in effective governing including sections on public sector management and socioeconomic development. While highlighting the challenges facing government officials and law enforcement such as crisis response and natural disaster management, this book shows how technology use can make those areas of government more efficient and improve preventative measures. This book is an ideal resource for law enforcement, government officials and agencies, policymakers, public servants, citizen activists, researchers, and political leaders seeking cutting-edge information to strengthen their government's relationship with society and their constituents while also strengthening their policy measures through new technology and methods.

Cognitive Radio Networks Tao Jiang 2015-04-08 Resource allocation is an important issue in wireless communication networks. In recent decades, cognitive radio-based networks have

garnered increased attention and have been well studied to overcome the problem of spectrum scarcity in future wireless communications systems. Many new challenges in resource allocation appear in cognitive radio-based networks. This book focuses on effective resource allocation solutions in several important cognitive radio-based networks, including opportunistic spectrum access networks, cooperative sensing networks, cellular networks, high-speed vehicle networks, and smart grids. Cognitive radio networks are composed of cognitive, spectrum-agile devices capable of changing their configuration on the fly based on the spectral environment. This capability makes it possible to design flexible and dynamic spectrum access strategies with the purpose of opportunistically reusing portions of the spectrum temporarily vacated by licensed primary users. Different cognitive radio-based networks focus on different network resources, such as transmission slots, sensing nodes, transmission power, white space, and sensing channels. This book introduces several innovative resource allocation schemes for different cognitive radio-based networks according to their network characteristics: Opportunistic spectrum access networks – Introduces a probabilistic slot allocation scheme to effectively allocate the transmission slots to secondary users to maximize throughput Cooperative sensing networks – Introduces a new adaptive collaboration sensing scheme in which the resources of secondary users are effectively utilized to sense the channels for efficient acquisition of spectrum opportunities Cellular networks – Introduces a framework of cognitive radio-assisted cooperation for downlink transmissions to allocate transmission modes, relay stations, and transmission power/sub-channels to secondary users to maximize throughput High-speed vehicle networks – Introduces schemes to maximize the utilized TV white space through effective allocation of white space resources to secondary users Smart grids – Introduces effective sensing channel allocation strategies for acquiring enough available spectrum channels for communications between utility and electricity consumers

Software Engineering for Enterprise System Agility: Emerging Research and Opportunities Zykov, Sergey V. 2018-07-06 Sustaining a competitive edge in today□s business world requires innovative approaches to product, service, and management systems design and performance. Advances in computing technologies have presented managers with additional challenges as well as further opportunities to enhance their business models. Software Engineering for Enterprise System Agility: Emerging Research and Opportunities is a collection of innovative research that identifies the critical technological and management factors in ensuring the agility of business systems and investigates process improvement and optimization through software development. Featuring coverage on a broad range of topics such as business architecture, cloud computing, and agility patterns, this publication is ideally designed for business managers, business professionals, software developers, academicians, researchers, and upper-level students interested in current research on strategies for improving the flexibility and agility of businesses and their systems.

Research Anthology on Agile Software, Software Development, and Testing Management Association, Information Resources 2021-11-26 Software development continues to be an ever-evolving field as organizations require new and innovative programs that can be implemented to make processes more efficient, productive, and cost-effective. Agile practices particularly have shown great benefits for improving the effectiveness of software development and its maintenance due to their ability to adapt to change. It is integral to remain up to date with the most emerging tactics and techniques involved in the development of new and innovative software. The Research Anthology on Agile Software, Software Development, and Testing is a comprehensive resource on the emerging trends of software

development and testing. This text discusses the newest developments in agile software and its usage spanning multiple industries. Featuring a collection of insights from diverse authors, this research anthology offers international perspectives on agile software. Covering topics such as global software engineering, knowledge management, and product development, this comprehensive resource is valuable to software developers, software engineers, computer engineers, IT directors, students, managers, faculty, researchers, and academicians.

Advances in Mobile Cloud Computing Systems F. Richard Yu 2015-12-01 With recent advances in mobile communication technologies, more and more people are accessing cloud computing systems using mobile devices, such as smartphones and tablets. Unlike traditional mobile computing systems with limited capabilities, mobile cloud computing uses the powerful computing and storage resources available in the cloud to provide cutting-edge multimedia and information services. This book discusses the major research advances in mobile cloud computing systems. Contributed chapters from leading experts in this field cover different aspects of modeling, analysis, design, optimization, and architecture of mobile cloud computing systems. Advances in Mobile Cloud Computing Systems begins by discussing the background, features, and available service models of mobile cloud computing. It goes on to describe a mobile cloud computing system with several third party cloud mobile media (CMM) services that offers its services to a telecom operator. In this scenario, the telecom operator acts as broker that can mix and interchange the resources offered by the different CMM service providers. Subsequent contributed chapters discuss such key research areas as Energy-efficient task execution that reduces the energy consumption in both mobile devices and the cloud Design and architecture of a Proximity Cloud that delivers low-latency, bandwidth-efficient end-user services with a global footprint Virtual mobile networks in clouds that enable resource sharing between multiple mobile network operators Software piracy control framework in mobile cloud computing systems designed to prevent mobile application piracy Dynamic configuration of cloud radio access networks (C-RANs) to improve end-to-end TCP throughput performance in next generation wireless networks The book includes many supporting illustrations and tables along with a valuable set of references at the end of each chapter. With this book, researchers and practitioners will be well-equipped to advance the research and development in this emerging field.

Architecting Software Intensive Systems Anthony J. Lattanze 2008-11-18 Architectural design is a crucial first step in developing complex software intensive systems. Early design decisions establish the structures necessary for achieving broad systemic properties. However, today's organizations lack synergy between software their development processes and technological methodologies. Providing a thorough treatment of

Computer Systems and Software Engineering: Concepts, Methodologies, Tools, and Applications Management Association, Information Resources 2017-12-01 Professionals in the interdisciplinary field of computer science focus on the design, operation, and maintenance of computational systems and software. Methodologies and tools of engineering are utilized alongside computer applications to develop efficient and precise information databases. Computer Systems and Software Engineering: Concepts, Methodologies, Tools, and Applications is a comprehensive reference source for the latest scholarly material on trends, techniques, and uses of various technology applications and examines the benefits and challenges of these computational developments. Highlighting a range of pertinent topics such as utility computing, computer security, and information systems applications, this multi-volume book is ideally designed for academicians, researchers, students, web designers, software developers, and practitioners interested in

computer systems and software engineering.

Strategic Data Warehousing Neera Bhansali 2009-07-29 Organization of data warehouses is a vital, but often neglected, aspect of growing an enterprise. Unlike most books on the subject that focus on either the technical aspects of building data warehouses or on business strategies, this valuable reference synthesizes technological know-how with managerial best practices to show how improved alignment between data warehouse plans and business strategies can lead to successful data warehouse adoption capable of supporting an enterprise's entire infrastructure. Strategic Data Warehousing: Achieving Alignment with Business provides data warehouse developers, business managers, and IT professionals and administrators with an integrated approach to achieving successful and sustainable alignment of data warehouses and business goals. More complete than any other text in the field, this comprehensive reference details the joint roles and responsibilities of the data warehouse and business managers in achieving strategic alignment, business user satisfaction, technical integration, and improved flexibility. Complete with case studies that depict real-world scenarios, the text: Examines the organizational, user, data, and technological factors proven to promote successful data warehousing Includes actionable solutions for achieving strategic alignment Provides a model that readers can apply in aligning their own data warehouse needs and business goals Achieving sustainable alignment between the data warehouse and business strategies is a continuous process. Armed with this valuable reference, readers will be able to gain the solid understanding of the organizational, technical, data, and user factors needed to promote a successful data warehouse adoption and become active partners in leveraging this powerful, but often overlooked, information resource.

Model and Data Engineering Alfredo Cuzzocrea 2013-09-10 This book constitutes the refereed proceedings of the Third International Conference on Model and Data Engineering, MEDI 2013, held in Amantea, Calabria, Italy, in September 2013. The 19 long papers and 3 short papers presented were carefully reviewed and selected from 61 submissions. The papers specifically focus on model engineering and data engineering with special emphasis on most recent and relevant topics in the areas of model-driven engineering, ontology engineering, formal modeling, security, and database modeling.

Advances in Communications-Based Train Control Systems F. Richard Yu 2015-11-05 With rapid population explosion, improving rail transit speed and capacity is strongly desirable around the world. Communication-based train control (CBTC) is an automated train control system using high capacity bidirectional train-ground communications to ensure the safe operation of rail vehicles. This book presents the latest advances in CBTC r

Agile Estimation Techniques and Innovative Approaches to Software Process Improvement Colomo-Palacios, Ricardo 2014-02-28 Applying methodologies of Software Process Improvement (SPI) is an effective way for businesses to remain competitive in the software industry. However, many organizations find implementing software process initiatives challenging. Agile Estimation Techniques and Innovative Approaches to Software Process Improvement reviews current SPI techniques and applications through discussions on current and future trends as well as the presentation of case studies on SPI implementation. Ideal for use by academics, students, and policy-makers, as well as industry professionals and managers, this publication provides a complete overview of current tools and methodologies regarding Software Process Improvement.

Analytical Evaluation of Nonlinear Distortion Effects on Multicarrier Signals Theresa Araújo 2015-04-22 Due to their ability to support reliable high quality of service as well as spectral and power efficiency, multicarrier modulation systems

have found increasing use in modern communications services. However, one of the main drawbacks of these systems is their vulnerability to nonlinear distortion effects. Analytical Evaluation of Nonlinear Distort

Understanding Spectrum Liberalisation Martin Sims 2015-08-26 Until the 1990s, almost all spectrum licenses were given away practically for free-even the first mobile licenses which laid the foundation for multi-billion dollar companies that dominate stock markets around the world. In the past fifteen years, there has been a concerted attempt to liberalise the sector and make it more open to market forces. Th

Crisis Management for Software Development and Knowledge Transfer Sergey V. Zykov 2016-07-30 This well structured book discusses lifecycle optimization of software projects for crisis management by means of software engineering methods and tools. Its outcomes are based on lessons learned from the software engineering crisis which started in the 1960s. The book presents a systematic approach to overcome the crisis in software engineering depends which not only depends on technology-related but also on human-related factors. It proposes an adaptive methodology for software product development, which optimizes the software product lifecycle in order to avoid “local” crises of software production. The general lifecycle pattern and its stages are discussed, and their impact on the time and budget of the software product development is analyzed. The book identifies key advantages and disadvantages for various models selected and concludes that there is no “silver bullet”, or universal model, which suits all software products equally well. It approaches software architecture in terms of process, data and system perspectives and proposes an incremental methodology for crisis-agile development of large-scale, distributed heterogeneous applications. The book introduces a number of specialized approaches which are widely used in industry but are often ignored in general writings because of their vendor-specificity. In doing so, the book builds a helpful bridge from academic conceptions of software engineering to the world of software engineering practice. With its systematic coverage of different software engineering methodologies and the presented rich systems engineering examples the book will be beneficial for a broader audience.

Effective Model-Based Systems Engineering John M. Borky 2018-09-08 This textbook presents a proven, mature Model-Based Systems Engineering (MBSE) methodology that has delivered success in a wide range of system and enterprise programs. The authors introduce MBSE as the state of the practice in the vital Systems Engineering discipline that manages complexity and integrates technologies and design approaches to achieve effective, affordable, and balanced system solutions to the needs of a customer organization and its personnel. The book begins with a summary of the background and nature of MBSE. It summarizes the theory behind Object-Oriented Design applied to complex system architectures. It then walks through the phases of the MBSE methodology, using system examples to illustrate key points. Subsequent chapters broaden the application of MBSE in Service-Oriented Architectures (SOA), real-time systems, cybersecurity, networked enterprises, system simulations, and prototyping. The vital subject of system and architecture governance completes the discussion. The book features exercises at the end of each chapter intended to help readers/students focus on key points, as well as extensive appendices that furnish additional detail in particular areas. The self-contained text is ideal for students in a range of courses in systems architecture and MBSE as well as for practitioners seeking a highly practical presentation of MBSE principles and techniques.

Search-Based Software Engineering Claire Le Goues 2014-07-21 This book constitutes the refereed proceedings of the 6th International Symposium on Search-Based Software

Engineering, SSBSE 2014, held in Fortaleza, Brazil. The 14 revised full papers presented together with 2 keynote addresses, 1 invited talk, 1 short paper, 3 papers of the graduate track, and 4 challenge track papers were carefully reviewed and selected from 51 submissions. Search Based Software Engineering (SBSE) studies the application of meta-heuristic optimization techniques to various software engineering problems, ranging from requirements engineering to software testing and maintenance.

Latin American Women and Research Contributions to the IT Field Negrón, Adriana Peña Pérez 2020-12-18 Although the effort to involve women in engineering has risen in recent years with the creation of new initiatives and the promotion of inclusion in technical disciplines, the active participation of women in engineering professions is continuously lower than expected. While the need for engineers appears to be constantly increasing, women still do not fill most of this role and have a long way to go to even reach an equal split in the field. This gender gap has a significant impact how women in the STEM fields are perceived as well as their experiences in their education and careers. When it comes to Latin American women in IT, their contribution to science can go unnoticed, their participation levels in these fields are very low, and they often occupy lower-level positions than their male counterparts. These issues need to be discussed, and the experiences of women who work in the field must be shared. Latin American Women and Research Contributions to the IT Field highlights the important role of Latin American women in IT by collecting and disseminating their frontier-research contributions in order to provide more visibility and inspire greater participation of Latin American women within the major field of computer science. With chapters contributed by female authors from eight Latin American and Caribbean countries, the book provides a deep analysis of these women's trajectory paths to high quality theoretical and applied relevant research in computer science and IT. While highlighting areas such as inclusivity and STEM education, along with advancements and achievements in topics that include nonverbal interaction in virtual reality, fuzzy logic applications in education, and ant colony optimization, this book is ideal for professionals, academics, students, and researchers working in the fields of information technologies and computer science as well as those interested in gender and women's studies.

Designing Software-Intensive Systems: Methods and Principles Tiako, Pierre F. 2008-07-31 "This book addresses the complex issues associated with software engineering environment capabilities for designing real-time embedded software systems"--Provided by publisher.

Handbook of Research on Engineering Education in a Global Context Smirnova, Elena V. 2018-08-31 Engineering education methods and standards are important features of engineering programs that should be carefully designed both to provide students and stakeholders with valuable, active, integrated learning experiences, and to provide a vehicle for assessing program outcomes. With the driving force of the globalization of the engineering profession, standards should be developed for mutual recognition of engineering education across the world, but it is proving difficult to achieve. The Handbook of Research on Engineering Education in a Global Context provides innovative insights into the importance of quality training and preparation for engineering students. It explores the common and current problems encountered in areas such as quality and standards, management information systems, innovation and enhanced learning technologies in education, as well as the challenges of employability, entrepreneurship, and diversity. This publication is vital reference source for science and engineering educators, engineering professionals, and educational administrators interested in topics centered on the education of students in the field of engineering.

Computing Handbook, Third Edition Teofilo Gonzalez

2014-05-07 Computing Handbook, Third Edition: Computer Science and Software Engineering mirrors the modern taxonomy of computer science and software engineering as described by the Association for Computing Machinery (ACM) and the IEEE Computer Society (IEEE-CS). Written by established leading experts and influential young researchers, the first volume of this popular handbook examines the elements involved in designing and implementing software, new areas in which computers are being used, and ways to solve computing problems. The book also explores our current understanding of software engineering and its effect on the practice of software development and the education of software professionals. Like the second volume, this first volume describes what occurs in research laboratories, educational institutions, and public and private organizations to advance the effective development and use of computers and computing in today's world. Research-level survey articles provide deep insights into the computing discipline, enabling readers to understand the principles and practices that drive computing education, research, and development in the twenty-first century.

Encyclopedia of Information Science and Technology, Fourth Edition Khosrow-Pour, D.B.A., Mehdi 2017-06-20 In recent years, our world has experienced a profound shift and progression in available computing and knowledge sharing innovations. These emerging advancements have developed at a rapid pace, disseminating into and affecting numerous aspects of contemporary society. This has created a pivotal need for an innovative compendium encompassing the latest trends, concepts, and issues surrounding this relevant discipline area. During the past 15 years, the Encyclopedia of Information Science and Technology has become recognized as one of the landmark sources of the latest knowledge and discoveries in this discipline. The Encyclopedia of Information Science and Technology, Fourth Edition is a 10-volume set which includes 705 original and previously unpublished research articles covering a full range of perspectives, applications, and techniques contributed by thousands of experts and researchers from around the globe. This authoritative encyclopedia is an all-encompassing, well-established reference source that is ideally designed to disseminate the most forward-thinking and diverse research findings. With critical perspectives on the impact of information science management and new technologies in modern settings, including but not limited to computer science, education, healthcare, government, engineering, business, and natural and physical sciences, it is a pivotal and relevant source of knowledge that will benefit every professional within the field of information science and technology and is an invaluable addition to every academic and corporate library.

Managing Trade-offs in Adaptable Software Architectures Ivan Mistrik 2016-08-12 Managing Trade-Offs in Adaptable Software Architectures explores the latest research on adapting large complex systems to changing requirements. To be able to adapt a system, engineers must evaluate different quality attributes, including trade-offs to balance functional and quality requirements to maintain a well-functioning system throughout the lifetime of the system. This comprehensive resource brings together research focusing on how to manage trade-offs and architect adaptive systems in different business contexts. It presents state-of-the-art techniques, methodologies, tools, best practices, and guidelines for developing adaptive systems, and offers guidance for future software engineering research and practice. Each contributed chapter considers the practical application of the topic through case studies, experiments, empirical validation, or systematic comparisons with other approaches already in practice. Topics of interest include, but are not limited to, how to architect a system for adaptability, software architecture for self-adaptive systems, understanding and balancing the trade-offs involved, architectural patterns for self-

adaptive systems, how quality attributes are exhibited by the architecture of the system, how to connect the quality of a software architecture to system architecture or other system considerations, and more. Explains software architectural processes and metrics supporting highly adaptive and complex engineering Covers validation, verification, security, and quality assurance in system design Discusses domain-specific software engineering issues for cloud-based, mobile, context-sensitive, cyber-physical, ultra-large-scale/internet-scale systems, mash-up, and autonomic systems Includes practical case studies of complex, adaptive, and context-critical systems

Cable and Wireless Networks Mário Marques da Silva 2018-09-03 Cable and Wireless Networks: Theory and Practice presents a comprehensive approach to networking, cable and wireless communications, and networking security. It describes the most important state-of-the-art fundamentals and system details in the field, as well as many key aspects concerning the development and understanding of current and emergent services. In this book, the author gathers in a single volume current and emergent cable and wireless network services and technologies. Unlike other books, which cover each one of these topics independently without establishing their natural relationships, this book allows students to quickly learn and improve their mastering of the covered topics with a deeper understanding of their interconnection. It also collects in a single source the latest developments in the area, typically only within reach of an active researcher. Each chapter illustrates the theory of cable and wireless communications with relevant examples, hands-on exercises, and review questions suitable for readers with a BSc degree or an MSc degree in computer science or electrical engineering. This approach makes the book well suited for higher education students in courses such as networking, telecommunications, mobile communications, and network security. This is an excellent reference book for academic, institutional, and industrial professionals with technical responsibilities in planning, design and development of networks, telecommunications and security systems, and mobile communications, as well as for Cisco CCNA and CCNP exam preparation.

Just Enough Software Architecture George Fairbanks 2010-08-30 This is a practical guide for software developers, and different than other software architecture books. Here's why: It teaches risk-driven architecting. There is no need for meticulous designs when risks are small, nor any excuse for sloppy designs when risks threaten your success. This book describes a way to do just enough architecture. It avoids the one-size-fits-all process tar pit with advice on how to tune your design effort based on the risks you face. It democratizes architecture. This book seeks to make architecture relevant to all software developers. Developers need to understand how to use constraints as guiderails that ensure desired outcomes, and how seemingly small changes can affect a system's properties. It cultivates declarative knowledge. There is a difference between being able to hit a ball and knowing why you are able to hit it, what psychologists refer to as procedural knowledge versus declarative knowledge. This book will make you more aware of what you have been doing and provide names for the concepts. It emphasizes the engineering. This book focuses on the technical parts of software development and what developers do to ensure the system works not job titles or processes. It shows you how to build models and analyze architectures so that you can make principled design tradeoffs. It describes the techniques software designers use to reason about medium to large sized problems and points out where you can learn specialized techniques in more detail. It provides practical advice. Software design decisions influence the architecture and vice versa. The approach in this book embraces drill-down/pop-up behavior by describing models that have various levels of abstraction, from architecture to data structure design.

Multi-Carrier Communication Systems with Examples in MATLAB® Emad Hassan 2016-01-05 Detailing the advantages and limitations of multi-carrier communication, this book proposes possible solutions for these limitations. Multi-Carrier Communication Systems with Examples in MATLAB®: A New Perspective addresses the two primary drawbacks of orthogonal frequency division multiplexing (OFDM) communication systems: the high sensitivity to carrier frequency offsets and phase noise, and the high peak-to-average power ratio (PAPR) of the transmitted signals. Presenting a new interleaving scheme for multicarrier communication, the book starts with a detailed overview of multi-carrier systems such as OFDM, multi-carrier code division multiple access (MC-CDMA), and single-carrier frequency division multiple access (SC-FDMA) systems. From there, it proposes a new way to deal with the frequency-selective fading channel: the single-carrier with frequency domain equalization (SC-FDE) scheme. The second part of the book examines the performance of the continuous phase modulation (CPM)-based OFDM (CPM-OFDM) system. It proposes a CPM-based single-carrier frequency domain equalization (CPM-SC-FDE) structure for broadband wireless communication systems. In the third part of the book, the author proposes a chaotic interleaving scheme for both CPM-OFDM and the CPM-SC-FDE systems. A comparison between the proposed chaotic interleaving and the conventional block interleaving is also performed in this part. The final part of the book presents efficient image transmission techniques over multi-carrier systems such as OFDM, MC-CDMA, and SC-FDMA. It details a new approach for efficient image transmission over OFDM and MC-CDMA systems using chaotic interleaving that transmits images over wireless channels efficiently. The book studies the performance of discrete cosine transform-based single-carrier frequency division multiple access (DCT-SC-FDMA) with image transmission. It also proposes a CPM-based DCT-SC-FDMA structure for efficient image transmission. The book includes MATLAB® simulations along with MATLAB code so you can practice carrying out your own extensive simulations.

Designing Software Architectures Humberto Cervantes 2016-04-29 Designing Software Architectures will teach you how to design any software architecture in a systematic, predictable, repeatable, and cost-effective way. This book introduces a practical methodology for architecture design that any professional software engineer can use, provides structured methods supported by reusable chunks of design knowledge, and includes rich case studies that demonstrate how to use the methods. Using realistic examples, you'll master the powerful new version of the proven Attribute-Driven Design (ADD) 3.0 method and will learn how to use it to address key drivers, including quality attributes, such as modifiability, usability, and availability, along with functional requirements and architectural concerns. Drawing on their extensive experience, Humberto Cervantes and Rick Kazman guide you through crafting practical designs that support the full software life cycle, from requirements to maintenance and evolution. You'll learn how to successfully integrate design in your organizational context, and how to design systems that will be built with agile methods. Comprehensive coverage includes Understanding what architecture design involves, and where it fits in the full software development life cycle Mastering core design concepts, principles, and processes Understanding how to perform the steps of the ADD method Scaling design and analysis up or down, including design for pre-sale processes or lightweight architecture reviews Recognizing and optimizing critical relationships between analysis and design Utilizing proven, reusable design primitives and adapting them to specific problems and contexts Solving design problems in new domains, such as cloud, mobile, or big data