

Requirements Engineering From System Goals To Uml Models To Software Specifications By Axel Van Lamsweerde 2009 02 09

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Engineering Secure Software and Systems - Úlfar Erlingsson 2011-01-24

This book constitutes the refereed proceedings of the Third International Symposium on Engineering Secure Software and Systems, ESSoS 2011, held in Madrid, Italy, in February 2011. The 18 revised full papers presented together with 3 idea papers were carefully reviewed and selected from 63 submissions. The papers are organized in topical sections on model-based security, tools and mechanisms, Web security, security requirements engineering, and authorization.

Trustworthy Cyber-Physical Systems Engineering - Alexander Romanovsky 2016-10-03

From the Foreword "Getting CPS dependability right is essential to forming a solid foundation for a world that increasingly depends on such systems. This book represents the cutting edge of what we know about rigorous ways to ensure that our CPS designs are trustworthy. I recommend it to anyone who wants to get a deep look at these concepts that will form a cornerstone for future CPS designs." --Phil Koopman, Carnegie Mellon University, Pittsburgh, Pennsylvania, USA Trustworthy Cyber-Physical Systems Engineering provides practitioners and researchers with a comprehensive introduction to the area of trustworthy Cyber Physical Systems (CPS) engineering. Topics in this book cover questions such as What does having a trustworthy CPS actually mean for something as pervasive as a global-scale CPS? How does CPS trustworthiness map onto existing knowledge, and where do we need to know more? How can we mathematically prove timeliness, correctness, and other essential properties for systems that may be adaptive and even self-healing? How can we better represent the physical reality underlying real-world numeric quantities in the computing system? How can we establish, reason about, and ensure trust between CPS components that are designed, installed, maintained, and operated by different organizations, and which may never have really been intended to work together? Featuring contributions from leading international experts, the book contains sixteen self-contained chapters that analyze the challenges in developing trustworthy CPS, and identify important issues in developing engineering methods for CPS. The book addresses various issues contributing to trustworthiness complemented by contributions on TCSP roadmapping, taxonomy, and standardization, as well as experience in deploying advanced system engineering methods in industry. Specific approaches to ensuring trustworthiness, namely, proof and refinement, are covered, as well as engineering methods for dealing with hybrid aspects.

Software System Reliability and Security - Charles Antony Richard Hoare 2007

"Information security covers the protection of information against unauthorized disclosure, transfer, modification, and destruction, whether accidentally or intentionally. Quality of life in general and of individual citizens, and the effectiveness of the economy critically depends on our ability to build software in a transparent and efficient way. Furthermore, we must be able to enhance the software development process systematically in order to ensure software's safety and security. This, in turn, requires very high software reliability, i.e., an extremely high confidence in the ability of the software to perform flawlessly. Foundations of software technology provide models that enable us to capture application domains and their requirements, but also to understand the structure and working of software systems and software architectures. Based on these foundations tools allow to prove and

ensure the correctness of software's functioning. New developments must pay due diligence to the importance of security-related aspects, and align current methods and techniques to information security, integrity, and system reliability. The articles in this book describe the state-of-the-art ideas on how to meet these challenges in software engineering."

Requirements Engineering for Safety-Critical Systems - Luiz Eduardo G. Martins 2022-09-01

Safety-Critical Systems (SCS) are increasingly present in people's daily activities. In the means of transport, in medical treatments, in industrial processes, in the control of air, land, maritime traffic, and many other situations, we use and depend on SCS. The requirements engineering of any system is crucial for the proper development of the same, and it becomes even more relevant for the development of SCS. Requirements Engineering is a discipline that focuses on the development of techniques, methods, processes, and tools that assist in the design of software and systems, covering the activities of elicitation, analysis, modeling and specification, validation, and management of requirements. The complete specification of system requirements establishes the basis for its architectural design. It offers a description of the functional and quality aspects that should guide the implementation and system evolution. In this book, we discuss essential elements of requirements engineering applied to SCS, such as the relationship between safety/hazard analysis and requirements specification, a balance between conservative and agile methodologies during SCS development, the role of requirements engineering in safety cases, and requirements engineering maturity model for SCS. This book provides relevant insights for professionals, students, and researchers interested in improving the quality of the SCS development process, making system requirements a solid foundation for improving the safety and security of future systems. **Availability, Reliability, and Security in Information Systems and HCI** - Alfredo Cuzzocrea 2013-08-19

This book constitutes the refereed proceedings of the IFIP WG 8.4, 8.9, TC 5 International Cross-Domain Conference on Availability, Reliability and Security, CD-ARES 2013, held in Regensburg, Germany, in September 2013. The 21 revised papers presented were carefully reviewed and selected for inclusion in the volume. The papers concentrate on the many aspects of information systems bridging the gap between research results in computer science and the many application fields. They are organized in the following topical sections: economic, ethical, legal, multilingual, organizational and social aspects; context-oriented information integration; data/information management as a service; context-oriented information integration and location-aware computing; security and privacy; risk management and business continuity; and security and privacy and location based applications. Also included are 15 papers from a special session on Human-Computer Interaction and Knowledge Discovery (HCI-KDD 2013).

Designing Usable and Secure Software with IRIS and CAIRIS - Shamal Faily 2018-04-28

Everyone expects the products and services they use to be secure, but 'building security in' at the earliest stages of a system's design also means designing for use as well. Software that is unusable to end-users and unwieldy to developers and administrators may be insecure as errors and violations may expose exploitable vulnerabilities. This book shows how practitioners and researchers can build both security and usability into the design of systems. It introduces the IRIS framework and the

open source CAIRIS platform that can guide the specification of secure and usable software. It also illustrates how IRIS and CAIRIS can complement techniques from User Experience, Security Engineering and Innovation & Entrepreneurship in ways that allow security to be addressed at different stages of the software lifecycle without disruption. Real-world examples are provided of the techniques and processes illustrated in this book, making this text a resource for practitioners, researchers, educators, and students.

Knowledge-Based Software Engineering: 2020 - Maria Virvou 2020-07-24

This book summarizes the research findings presented at the 13th International Joint Conference on Knowledge-Based Software Engineering (JCKBSE 2020), which took place on August 24-26, 2020. JCKBSE 2020 was originally planned to take place in Larnaca, Cyprus. Unfortunately, the COVID-19 pandemic forced it be rescheduled as an online conference. JCKBSE is a well-established, international, biennial conference that focuses on the applications of artificial intelligence in software engineering. The 2020 edition of the conference was organized by Hiroyuki Nakagawa, Graduate School of Information Science and Technology, Osaka University, Japan, and George A. Tsihrantzis and Maria Virvou, Department of Informatics, University of Piraeus, Greece. This research book is a valuable resource for experts and researchers in the field of (knowledge-based) software engineering, as well as general readers in the fields of artificial and computational Intelligence and, more generally, computer science wanting to learn more about the field of (knowledge-based) software engineering and its applications. An extensive list of bibliographic references at the end of each paper helps readers to probe further into the application areas of interest to them.

Information Systems Development - Jaroslav Pokorny 2011-09-02

Information Systems Development: Business Systems and Services: Modeling and Development, is the collected proceedings of the 19th International Conference on Information Systems Development held in Prague, Czech Republic, August 25 - 27, 2010. It follows in the tradition of previous conferences in the series in exploring the connections between industry, research and education. These proceedings represent ongoing reflections within the academic community on established information systems topics and emerging concepts, approaches and ideas. It is hoped that the papers herein contribute towards disseminating research and improving practice.

Requirements Engineering - Elizabeth Hull 2010-10-05

Written for those who want to develop their knowledge of requirements engineering process, whether practitioners or students. Using the latest research and driven by practical experience from industry, Requirements Engineering gives useful hints to practitioners on how to write and structure requirements. It explains the importance of Systems Engineering and the creation of effective solutions to problems. It describes the underlying representations used in system modeling and introduces the UML2, and considers the relationship between requirements and modeling. Covering a generic multi-layer requirements process, the book discusses the key elements of effective requirements management. The latest version of DOORS (Version 7) - a software tool which serves as an enabler of a requirements management process - is also introduced to the reader here. Additional material and links are available at: <http://www.requirementsengineering.info>

Requirements Engineering - Klaus Pohl 2010-07-24

Requirements engineering is the process of eliciting individual stakeholder requirements and needs and developing them into detailed, agreed requirements documented and specified in such a way that they can serve as the basis for all other system development activities. In this textbook, Klaus Pohl provides a comprehensive and well-structured introduction to the fundamentals, principles, and techniques of requirements engineering. He presents approved techniques for eliciting, negotiating and documenting as well as validating, and managing requirements for software-intensive systems. The various aspects of the process and the techniques are illustrated using numerous examples based on his extensive teaching experience and his work in industrial collaborations. His presentation aims at professionals, students, and lecturers in systems and software engineering or business applications development. Professionals such as project managers, software architects, systems analysts, and software engineers will benefit in their daily work from the didactically well-presented combination of validated procedures and industrial experience. Students and lecturers will appreciate the comprehensive description of sound fundamentals, principles, and techniques, which is completed by a huge commented list of references for further reading. Lecturers will find additional teaching material on the book's website, www.requirements-book.com.

Requirements Engineering - 2009

Requirements Engineering Toward Sustainable World - Seok-Won Lee 2016-11-07

This book constitutes the proceedings of the Third Asia Pacific Requirements Engineering Symposium, APRES 2016, held in Nagoya, Japan, in November 2016. The 7 full papers presented together with three short papers, were carefully reviewed and selected from 14 submissions. The papers are organized in topical sections on requirements traceability and prioritization; requirements modeling and process for quality; requirements validation; requirements analysis.

Engineering Dependable Software Systems - NATO Emerging Security Challenges Division 2013-06-19

Because almost all technical systems are more or less interfaced with software these days, attacks against computer systems can cause considerable economic and physical damage. For this reason, understanding the dependability of such systems, as well as the improvement of cyber security and its development process, are amongst the most challenging and crucial issues in current computer science research. This book contains the lectures from the NATO Advanced Study Institute (ASI) Summer School entitled Engineering Dependable Software Systems, held in Marktoberdorf, Germany, in July and August 2012. This two week course for young computer scientists and mathematicians working in the field of formal software and systems was designed to give an in-depth presentation of state-of-the-art topics in the field, as well as promoting international contacts and collaboration and the teaming up of leading researchers and young scientists. The 12 lectures delivered at the school and presented here cover subjects including: model-based testing, formal modeling and verification, deductively verified software, model checking, performance analysis, integrating risk analysis, embedded systems and model checking, among others. The book will be of interest to all those whose work involves the development of large-scale, reliable and secure software systems.

Requirements Engineering: Foundation for Software Quality - Samuel A. Fricker 2015-03-13

This book constitutes the refereed proceedings of the 20th International Working Conference on Requirements Engineering: Foundation for Software Quality, REFSQ 2014, held in Essen, Germany, in April 2013. The 23 papers presented together with 1 keynote were carefully reviewed and selected from 62 submissions. The REFSQ'15 conference is organized as a three-day symposium. The REFSQ'15 has chosen a special conference theme "I heard it first at RefsQ". Two conference days were devoted to presentation and discussion of scientific papers. The two days connect to the conference theme with a keynote, an invited talk and poster presentations. There were two parallel tracks on the third day: the Industry Track and the new Research Methodology Track. REFSQ 2015 seeks reports of novel ideas and techniques that enhance the quality of RE's products and processes, as well as reflections on current research and industrial RE practices.

Intentional Perspectives on Information Systems Engineering - Selmin Nurcan 2010-06-17

Requirements engineering has since long acknowledged the importance of the notion that system requirements are stakeholder goals—rather than system functions—and ought to be elicited, modeled and analyzed accordingly. In this book, Nurcan and her co-editors collected twenty contributions from leading researchers in requirements engineering with the intention to comprehensively present an overview of the different perspectives that exist today, in 2010, on the concept of intention in the information systems community. These original papers honor Colette Rolland for her contributions to this field, as she was probably the first to emphasize that 'intention' has to be considered as a first-class concept in information systems engineering. Written by long-term collaborators (and most often friends) of Colette Rolland, this volume covers topics like goal-oriented requirements engineering, model-driven development, method engineering, and enterprise modeling. As such, it is a tour d'horizon of Colette Rolland's lifework, and is presented to her on the occasion of her retirement at CalSE 2010 in Hammamet, the conference she once cofounded and which she helped to grow and prosper for more than 20 years.

Multimedia Services in Intelligent Environments - George A Tsihrantzis 2010-09-08

KES International (KES) is a worldwide organisation that provides a professional community and association for researchers, originally in the discipline of Knowledge Based and Intelligent Engineering Systems, but now extending into other related areas. Through this, KES provides its

members with opportunities for publication and beneficial interaction. The focus of KES is research and technology transfer in the area of Intelligent Systems, i.e. computer-based software systems that operate in a manner analogous to the human brain, in order to perform advanced tasks. Recently KES has started to extend its area of interest to encompass the contribution that intelligent systems can make to sustainability and renewable energy, and also the knowledge transfer, innovation and enterprise agenda. Involving several thousand researchers, managers and engineers drawn from universities and companies world-wide, KES is in an excellent position to facilitate international research co-operation and generate synergy in the area of artificial intelligence applied to real-world 'Smart' systems and the underlying related theory. The KES annual conference covers a broad spectrum of intelligent systems topics and attracts several hundred delegates from a range of countries round the world. KES also organises symposia on specific technical topics, for example, Agent and Multi Agent Systems, Intelligent Decision Technologies, Intelligent Interactive Multimedia Systems and Services, Sustainability in Energy and Buildings and Innovations through Knowledge Transfer. KES is responsible for two peer-reviewed journals, the International Journal of Knowledge based and Intelligent Engineering Systems, and Intelligent Decision Technologies: an International Journal.

Availability, Reliability, and Security in Information Systems - Stephanie Teufel 2014-09-03

This volume constitutes the refereed proceedings of two workshops: the International Cross-Domain Conference and Workshop on Availability, Reliability and Security, CD-ARES 2014, and the 4th International Workshop on Security and Cognitive Informatics for Homeland Defense, SeCIHD 2014, co-located with the International Conference on Availability, Reliability and Security, ARES 2014, held in Fribourg, Switzerland, in September 2014. The 23 revised full papers presented were carefully reviewed and selected from numerous submissions. The papers deal with knowledge management, software security, mobile and social computing, enterprise information systems, homeland security and information processing.

Requirements Engineering - Axel van Lamsweerde 2009-02-09

Essential comprehensive coverage of the fundamentals of requirements engineering Requirements engineering (RE) deals with the variety of prerequisites that must be met by a software system within an organization in order for that system to produce stellar results. With that explanation in mind, this must-have book presents a disciplined approach to the engineering of high-quality requirements. Serving as a helpful introduction to the fundamental concepts and principles of requirements engineering, this guide offers a comprehensive review of the aim, scope, and role of requirements engineering as well as best practices and flaws to avoid. Shares state-of-the-art techniques for domain analysis, requirements elicitation, risk analysis, conflict management, and more Features in-depth treatment of system modeling in the specific context of engineering requirements Presents various forms of reasoning about models for requirements quality assurance Discusses the transitions from requirements to software specifications to software architecture In addition, case studies are included that complement the many examples provided in the book in order to show you how the described method and techniques are applied in practical situations.

Software Engineering for Self-Adaptive Systems - Rogério de Lemos 2013-01-03

Although the self-adaptability of systems has been studied in a wide range of disciplines, from biology to robotics, only recently has the software engineering community recognized its key role in enabling the development of self-adaptive systems that are able to adapt to internal faults, changing requirements, and evolving environments. The 15 carefully reviewed papers included in this state-of-the-art survey were presented at the International Seminar on "Software Engineering for Self-Adaptive Systems", held in Dagstuhl Castle, Germany, in October 2010. Continuing the course of the first book of the series on "Software Engineering for Self-Adaptive Systems" the collection of papers in this second volume comprises a research roadmap accompanied by four elaborating working group papers. Next there are two parts - with three papers each - entitled "Requirements and Policies" and "Design Issues"; part four of the book contains four papers covering a wide range of "Applications".

Model-Based Engineering of Embedded Systems - Klaus Pohl 2012-11-08

Embedded systems have long become essential in application areas in which human control is impossible or infeasible. The development of

modern embedded systems is becoming increasingly difficult and challenging because of their overall system complexity, their tighter and cross-functional integration, the increasing requirements concerning safety and real-time behavior, and the need to reduce development and operation costs. This book provides a comprehensive overview of the Software Platform Embedded Systems (SPES) modeling framework and demonstrates its applicability in embedded system development in various industry domains such as automation, automotive, avionics, energy, and healthcare. In SPES 2020, twenty-one partners from academia and industry have joined forces in order to develop and evaluate in different industrial domains a modeling framework that reflects the current state of the art in embedded systems engineering. The content of this book is structured in four parts. Part I "Starting Point" discusses the status quo of embedded systems development and model-based engineering, and summarizes the key requirements faced when developing embedded systems in different application domains. Part II "The SPES Modeling Framework" describes the SPES modeling framework. Part III "Application and Evaluation of the SPES Modeling Framework" reports on the validation steps taken to ensure that the framework met the requirements discussed in Part I. Finally, Part IV "Impact of the SPES Modeling Framework" summarizes the results achieved and provides an outlook on future work. The book is mainly aimed at professionals and practitioners who deal with the development of embedded systems on a daily basis. Researchers in academia and industry may use it as a compendium for the requirements and state-of-the-art solution concepts for embedded systems development.

Advanced Information Systems Engineering - Camille Salinesi 2013-06-20

This book constitutes the refereed proceedings of the 25th International Conference on Advanced Information Systems Engineering, CAiSE 2013, held in Valencia, Spain, in June 2013. The 44 revised full papers were carefully reviewed and selected from 162 submissions. The contributions have been grouped into the following topical sections: services; awareness; business process execution; products; business process modelling; modelling languages and meta models; requirements engineering 1; enterprise architecture; information systems evolution; mining and predicting; data warehouses and business intelligence; requirements engineering 2; knowledge and know-how; information systems quality; and human factors.

Requirements Writing for System Engineering - George Koelsch 2016-10-20

Learn how to create good requirements when designing hardware and software systems. While this book emphasizes writing traditional "shall" statements, it also provides guidance on use case design and creating user stories in support of agile methodologies. The book surveys modeling techniques and various tools that support requirements collection and analysis. You'll learn to manage requirements, including discussions of document types and digital approaches using spreadsheets, generic databases, and dedicated requirements tools. Good, clear examples are presented, many related to real-world work the author has done during his career. Requirements Writing for System Engineering advantages of different requirements approaches and implement them correctly as your needs evolve. Unlike most requirements books, Requirements Writing for System Engineering teaches writing both hardware and software requirements because many projects include both areas. To exemplify this approach, two example projects are developed throughout the book, one focusing on hardware and the other on software. This book Presents many techniques for capturing requirements. Demonstrates gap analysis to find missing requirements. Shows how to address both software and hardware, as most projects involve both. Provides extensive examples of "shall" statements, user stories, and use cases. Explains how to supplement or replace traditional requirement statements with user stories and use cases that work well in agile development environments What You Will Learn Understand the 14 techniques for capturing all requirements. Address software and hardware needs; because most projects involve both. Ensure all statements meet the 16 attributes of a good requirement. Differentiate the 19 different functional types of requirement, and the 31 non-functional types. Write requirements properly based on extensive examples of good 'shall' statements, user stories, and use cases. Employ modeling techniques to mitigate the imprecision of words. Audience Writing Requirements teaches you to write requirements the correct way. It is targeted at the requirements engineer who wants to improve and master his craft. This is also an excellent book from which to teach requirements engineering at the university level. Government

organizations at all levels, from Federal to local levels, can use this book to ensure they begin all development projects correctly. As well, contractor companies supporting government development are also excellent audiences for this book.

Advances in Conceptual Modeling - Marta Indulska 2014-10-10

This book constitutes the refereed proceedings of workshops, held at the 33rd International Conference on Conceptual Modeling, ER 2014, in Atlanta, GA, USA in October 2014. The 24 revised full and 6 short papers were carefully reviewed and selected out of 59 submissions and are presented together with 4 demonstrations. The papers are organized in sections related to the individual workshops: the First International Workshop on Enterprise Modeling, ENMO 2014; the Second International Workshop on Modeling and Management of Big Data, MoBiD 2014; the First International Workshop on Conceptual Modeling in Requirements and Business Analysis, MReBA 2014; the First International Workshop on Quality of Models and Models of Quality, QMMQ 2014; the 8th International Workshop on Semantic and Conceptual Issues in GIS, SeCoGIS 2014; and the 11th International Workshop on Web Information Systems Modeling, WISM 2014. The contributions cover a variety of topics in conceptual modeling, including requirements and enterprise modeling, modeling of big data, spatial conceptual modeling, exploring the quality of models, and issues specific to the design of web information systems.

Model Driven Engineering Languages and Systems - Robert B. France 2012-09-19

This book constitutes the refereed proceedings of the 15th International Conference on Model Driven Engineering Languages and Systems, MODELS 2012, held in Innsbruck, Austria, in September/October 2012. The 50 papers presented in this volume were carefully reviewed and selected from a total of 181 submissions. They are organized in topical sections named: metamodels and domain specific modeling; models at runtime; model management; modeling methods and tools, consistency analysis, software product lines; foundations of modeling; static analysis techniques; model testing and simulation; model transformation; model matching, tracing and synchronization; modeling practices and experience; and model analysis.

Conceptual Modeling: Foundations and Applications - Alex T. Borgida 2009-07-06

This Festschrift volume, published in honor of John Mylopoulos on the occasion of his retirement from the University of Toronto, contains 25 high-quality papers, written by leading scientists in the field of conceptual modeling. The volume has been divided into six sections. The first section focuses on the foundations of conceptual modeling and contains material on ontologies and knowledge representation. The four sections on software and requirements engineering, information systems, information integration, and web and services, represent the chief current application domains of conceptual modeling. Finally, the section on implementations concentrates on projects that build tools to support conceptual modeling. With its in-depth coverage of diverse topics, this book could be a useful companion to a course on conceptual modeling.

Requirements Engineering for Internet of Things - Massila Kamalrudin 2018-01-04

This book constitutes the proceedings of the 4th Asia Pacific Requirements Engineering Symposium, APRES 2017, held in Melaka, Malaysia, in November 2017. The 11 full papers presented together with four short papers were carefully reviewed and selected from 45 submissions. The papers are organized in topical sections on big data, cyber security, crowd-sourcing, requirements challenges, automation.

Interactive Modeling and Simulation in Business System Design - Ella Roubtsova 2016-11-16

This classroom-texted textbook/reference presents a set of useful modeling techniques, describing how these can be combined into a powerful framework for the analysis and design of business systems. These techniques follow an interactive modeling and simulation (IMS) approach, enabling the modeling and simulation of separate parts of the system at different levels of abstraction, and the composition of these parts in a flexible crosscutting manner that preserves the behavior of the individual parts. Topics and features: presents a detailed introduction to the foundations of IMS for business system design, covering protocol modeling and goal modeling semantics; describes the practical application of IMS for business system design, illustrated by a selection of useful case studies; highlights the advantages of this approach to IMS for business system design, with a focus on performance management, motivation modeling, and communication; includes review questions and exercises at the end of each chapter.

Generative and Transformational Techniques in Software Engineering IV - Ralf Lämmel 2013-01-03

This tutorial volume includes revised and extended lecture notes of six long tutorials, five short tutorials, and one peer-reviewed participant contribution held at the 4th International Summer School on Generative and Transformational Techniques in Software Engineering, GTTSE 2011. The school presents the state of the art in software language engineering and generative and transformational techniques in software engineering with coverage of foundations, methods, tools, and case studies.

Advanced Information Systems Engineering - Matthias Jarke 2014-06-05

This book constitutes the proceedings of 26th International Conference on Advanced Information Systems Engineering, CAiSE 2014, held in Thessaloniki, Greece in June 2014. The 41 papers and 3 keynotes presented were carefully reviewed and selected from 226 submissions. The accepted papers were presented in 13 sessions: clouds and services; requirements; product lines; requirements elicitation; processes; risk and security; process models; data mining and streaming; process mining; models; mining event logs; databases; software engineering.

Software Engineering for Variability Intensive Systems - Ivan Mistrik 2019-01-15

This book addresses the challenges in the software engineering of variability-intensive systems. Variability-intensive systems can support different usage scenarios by accommodating different and unforeseen features and qualities. The book features academic and industrial contributions that discuss the challenges in developing, maintaining and evolving systems, cloud and mobile services for variability-intensive software systems and the scalability requirements they imply. The book explores software engineering approaches that can efficiently deal with variability-intensive systems as well as applications and use cases benefiting from variability-intensive systems.

Security Requirements Engineering - Fabiano Dalpiaz 2016-01-22

A novel, model-driven approach to security requirements engineering that focuses on socio-technical systems rather than merely technical systems. Security requirements engineering is especially challenging because designers must consider not just the software under design but also interactions among people, organizations, hardware, and software. Taking this broader perspective means designing a secure socio-technical system rather than a merely technical system. This book presents a novel, model-driven approach to designing secure socio-technical systems. It introduces the Socio-Technical Modeling Language (STS-ML) and presents a freely available software tool, STS-Tool, that supports this design approach through graphical modeling, automated reasoning capabilities to verify the models constructed, and the automatic derivation of security requirements documents. After an introduction to security requirements engineering and an overview of computer and information security, the book presents the STS-ML modeling language, introducing the modeling concepts used, explaining how to use STS-ML within the STS method for security requirements, and providing guidelines for the creation of models. The book then puts the STS approach into practice, introducing the STS-Tool and presenting two case studies from industry: an online collaborative platform and an e-Government system. Finally, the book considers other methods that can be used in conjunction with the STS method or that constitute an alternative to it. The book is suitable for course use or as a reference for practitioners. Exercises, review questions, and problems appear at the end of each chapter.

Advanced Use Case Modeling - Frank Armour 2000-12-29

"This book isn't just another introduction to use cases. The authors have used their wealth of experience to produce an excellent and insightful collection of detailed examples, explanations, and advice on how to work with use cases." -Maria Ericsson The toughest challenge in building a software system that meets the needs of your audience lies in clearly understanding the problems that the system must solve. Advanced Use Case Modeling presents a framework for discovering, identifying, and modeling the problem that the software system will ultimately solve. Software developers often employ use cases to specify what should be performed by the system they're constructing. Although use case-driven analysis, design, and testing of software systems has become increasingly popular, little has been written on the role of use cases in the complete software cycle. This book fills that need by describing how to create use case models for complex software development projects, using practical examples to explain conceptual information. The authors extend the work of software visionary Ivar Jacobson, using the Unified Modeling Language (UML) as the notation to describe the book's models. Aimed primarily at software professionals, Advanced Use Case Modeling

also includes information that relates use case technique to business processes. This book presents a process for creating and maintaining use case models in a framework that can be fully customized for your organization. The authors, pioneers in the application of use cases in software development, bring their extensive experience to cover topics such as: A process model for applying a use case model How to keep your use case modeling effort on track Tips and pitfalls in use case modeling How to organize your use case model for large-system development Similarities between Advanced Use Case Modeling and the Rational Unified Process framework Effect of use cases on user interface design Guidelines for quality use case modeling

Security Requirements Engineering - Fabiano Dalpiaz 2016-01-25

A novel, model-driven approach to security requirements engineering that focuses on socio-technical systems rather than merely technical systems. Security requirements engineering is especially challenging because designers must consider not just the software under design but also interactions among people, organizations, hardware, and software. Taking this broader perspective means designing a secure socio-technical system rather than a merely technical system. This book presents a novel, model-driven approach to designing secure socio-technical systems. It introduces the Socio-Technical Modeling Language (STS-ML) and presents a freely available software tool, STS-Tool, that supports this design approach through graphical modeling, automated reasoning capabilities to verify the models constructed, and the automatic derivation of security requirements documents. After an introduction to security requirements engineering and an overview of computer and information security, the book presents the STS-ML modeling language, introducing the modeling concepts used, explaining how to use STS-ML within the STS method for security requirements, and providing guidelines for the creation of models. The book then puts the STS approach into practice, introducing the STS-Tool and presenting two case studies from industry: an online collaborative platform and an e-Government system. Finally, the book considers other methods that can be used in conjunction with the STS method or that constitute an alternative to it. The book is suitable for course use or as a reference for practitioners. Exercises, review questions, and problems appear at the end of each chapter.

Requirements Engineering: Laying a Firm Foundation - James A. Crowder 2022-01-03

This textbook lays the foundations for System-of-Systems Requirements Engineering and Requirements Management practices, principles, technique, and processes. It provides a comprehensive treatment of requirements engineering, an integral part of Multidisciplinary Systems Engineering. The book takes the student/reader through the entire process of documenting, analyzing, tracing, prioritizing, and managing requirements, and then goes on to describe controlling and communicating requirement change throughout the system development lifecycle. The authors discuss the role of requirements management in support of other requirements engineering processes; describe the principal requirements engineering activities and their relationships; introduces techniques for requirements elicitation and analysis and describes requirements validation and the role of requirements reviews; and discusses the role of requirements management in support of other requirements engineering processes. A full suite of classroom material is provided including exercises, assignments, and PowerPoint slides.

Requirements Engineering: Foundation for Software Quality - Paul Grünbacher 2017-02-20

This book constitutes the proceedings of the 23rd International Working Conference on Requirements Engineering - Foundation for Software Quality, REFSQ 2017, held in Essen, Germany, in February/March 2017. The 16 full papers and 10 short papers presented in this volume were carefully reviewed and selected from 77 submissions. The papers were organized in topical sections named: use case models; ecosystems and innovation; human factors in requirements engineering; goal-orientation in requirements engineering; communication and collaboration; process and tool integration; visualization and representation of requirements; agile requirements engineering; natural language processing, information retrieval and machine learning traceability; quality of natural language requirements; research methodology in requirements

engineering.

Requirements Engineering: Foundation for Software Quality - Daniel M. Berry 2011-03-16

This book constitutes the refereed proceedings of the 17th International Working Conference on Requirements Engineering: Foundation for Software Quality, REFSQ 2011, held in Essen, Germany, in March 2011. The 10 revised full papers and the 9 short papers presented were carefully reviewed and selected from 59 submissions. The papers are organized in seven topical sections on security and sustainability; process improvement and requirements in context; elicitation; models; services; embedded and real-time systems; and prioritization and traceability.

Requirements Engineering: Foundation for Software Quality - Nazim Madhavji 2020-03-18

This book constitutes the proceedings of the 26th International Working Conference on Requirements Engineering - Foundation for Software Quality, REFSQ 2020, held in Pisa, Italy, in March 2020. The 14 full papers and 7 short papers in this volume were carefully reviewed and selected from 84 submissions. The papers are organized in the following topical sections: requirements specification; requirements documentation; privacy and legal requirements; stakeholders feedback and training; agile methods and requirements comprehension; requirements modelling; requirements visualization.

Search Based Software Engineering - Gordon Fraser 2012-09-07

This book constitutes the refereed proceedings of the Fourth International Symposium on Search-Based Software Engineering, SSBSE 2012, held in Riva del Garda, Italy in collocation with the 28th IEEE International Conference on Software Maintenance. The 15 revised full papers, 3 revised short papers, and 2 papers of the graduate track presented together with 2 keynote talks and 1 tutorial paper were carefully reviewed and selected from 38 initial 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. The papers present current research in all areas of Search Based Software Engineering, including theoretical work, research on SBSE applications, empirical studies, and reports on industrial experience.

Requirements Engineering: Foundation for Software Quality - Camille Salinesi 2014-03-17

This book constitutes the refereed proceedings of the 20th International Working Conference on Requirements Engineering: Foundation for Software Quality, REFSQ 2014, held in Essen, Germany, in April 2014. The 23 papers presented were carefully reviewed and selected from 89 submissions. The REFSQ conference is organised as a three-day symposium with two days devoted to scientific papers presentation with a one-day industry track in-between. Both the industry and scientific presentations concern a variety of topics, which shows the liveliness of the requirements engineering domain. These topics are for instance: scalability in RE, communication issues, compliance with law and regulations, RE for self adaptive systems, requirements traceability, new sources of requirements, domain specific RE, Natural Language issues and of course games. 'Games for RE and RE for Games' was the special topic of REFSQ 2014. This is materialized by a plenary session at the conference, and by a keynote given by Catherine Rolland, a serious games expert and project manager at KTM Advance, a French company specialized in serious games.

Advanced Information Systems Engineering - Jolita Ralyté 2012-07-16

This book constitutes the refereed proceedings of the 24th International Conference on Advanced Information Systems Engineering, CAiSE 2012, held in Gdansk, Poland, in June 2012. The 42 revised full papers, 2 full-length invited papers and 4 short tutorial papers, were carefully reviewed and selected from 297 submissions. The contributions have been grouped into the following topical sections: business process model analysis; service and component composition; language and models; system variants and configuration; process mining; ontologies; requirements and goal models; compliance; monitoring and prediction; services; case studies; business process design; feature models and product lines; and human factors.