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Case Study Research in Software Engineering Software Engineering Software Engineering for Multi-Agent Systems II Fundamentals of Software Engineering Basics of Software Engineering Experimentation Object-oriented Software Engineering Software Engineering at Google Object-Oriented Software Engineering Experimentation in Software Engineering How to Engineer Software Software Engineering for Multi-Agent Systems III Requirements Engineering for Software and Systems, Second Edition Software Design Methodology Software Engineering for Multi-Agent Systems IV Software Engineering for Real-time Systems A Discipline for Software Engineering Software Engineering Software Engineering Techniques Applied to Agricultural Systems Software Engineering with Reusable Components Generative and Transformational Techniques in Software Engineering II Action Research in Software Engineering Systems Engineering of Software-Enabled Systems Project-based Software Engineering Measure What Matters Analytic Methods in Systems and Software Testing Site Reliability Engineering Agent-Oriented Software Engineering XI Software Engineering Education in the Modern Age The Essentials of Modern Software Engineering Software Engineering for Science Foundations of Software Engineering A Concise Introduction to Software Engineering Formal Methods for Software Engineering Software Engineering Software Engineering Software Engineering: A Hands-On Approach Advances in Software Engineering Statistical Methods in Software Engineering Software Engineering with B Model-Driven Software Engineering in Practice

Systems Engineering of Software-Enabled Systems Jan 12 2021 A comprehensive review of the life cycle processes, methods, and techniques used to develop and modify software-enabled systems Systems Engineering of Software-Enabled Systems offers an authoritative review of the most current methods and techniques that can improve the links between systems engineering and software engineering. The author—a noted expert on the topic—offers an introduction to systems engineering and software engineering and presents the issues caused by the differences between the two during development process. The book reviews the traditional approaches used by systems engineers and software engineers and explores how they differ. The book presents an approach to developing software-enabled systems that integrates the incremental approach used by systems engineers and the iterative approach used by software engineers. This unique approach is based on developing system capabilities that will provide the features, behaviors, and quality attributes needed by stakeholders, based on model-based system architecture. In addition, the author covers the management activities that a systems engineer or software engineer must engage in to manage and lead the technical work to be done. This important book: Offers an approach to improving the process of working with systems engineers and software engineers Contains information on the planning and estimating, measuring and controlling, managing risk, and organizing and

leading systems engineering teams Includes a discussion of the key points of each chapter and exercises for review Suggests numerous references that provide additional readings for development of software-enabled physical systems Provides two case studies as running examples throughout the text Written for advanced undergraduates, graduate students, and practitioners, Systems Engineering of Software-Enabled Systems offers a comprehensive resource to the traditional and current techniques that can improve the links between systems engineering and software engineering.

Action Research in Software Engineering Feb 10 2021 This book addresses action research (AR), one of the main research methodologies used for academia-industry research collaborations. It elaborates on how to find the right research activities and how to distinguish them from non-significant ones. Further, it details how to glean lessons from the research results, no matter whether they are positive or negative. Lastly, it shows how companies can evolve and build talents while expanding their product portfolio. The book's structure is based on that of AR projects; it sequentially covers and discusses each phase of the project. Each chapter shares new insights into AR and provides the reader with a better understanding of how to apply it. In addition, each chapter includes a number of practical use cases or examples. Taken together, the chapters cover the entire software lifecycle: from problem diagnosis to project (or action) planning and execution, to documenting and disseminating results, including validity assessments for AR studies. The goal of this book is to help everyone interested in industry-academia collaborations to conduct joint research. It is for students of software engineering who need to learn about how to set up an evaluation, how to run a project, and how to document the results. It is for all academics who aren't afraid to step out of their comfort zone and enter industry. It is for industrial researchers who know that they want to do more than just develop software blindly. And finally, it is for stakeholders who want to learn how to manage industrial research projects and how to set up guidelines for their own role and expectations.

Software Engineering Nov 29 2019 This work aims to provide the reader with sound engineering principles, whilst embracing relevant industry practices and technologies, such as object orientation and requirements engineering. It includes a chapter on software architectures, covering software design patterns.

Fundamentals of Software Engineering Jul 30 2022 Practical Handbook to understand the hidden language of computer hardware and software DESCRIPTION This book teaches the essentials of software engineering to anyone who wants to become an active and independent software engineer expert. It covers all the software engineering fundamentals without forgetting a few vital advanced topics such as software engineering with artificial intelligence, ontology, and data mining in software engineering. The primary goal of the book is to introduce a limited number of concepts and practices which will achieve the following two objectives: Teach students the skills needed to execute a smallish commercial project. Provide students with the necessary conceptual background for undertaking advanced studies in software engineering through courses or on their own. KEY FEATURES - This book contains real-time executed examples along with case studies. - Covers advanced technologies that are intersectional with software engineering. - Easy and simple language, crystal clear approach, and straight forward comprehensible presentation. - Understand what architecture design involves, and where it fits in

the full software development life cycle. - Learning and optimizing the critical relationships between analysis and design. - Utilizing proven and reusable design primitives and adapting them to specific problems and contexts. WHAT WILL YOU LEARN This book includes only those concepts that we believe are foundational. As executing a software project requires skills in two dimensions—engineering and project management—this book focuses on crucial tasks in these two dimensions and discuss the concepts and techniques that can be applied to execute these tasks effectively. WHO THIS BOOK IS FOR The book is primarily intended to work as a beginner's guide for Software Engineering in any undergraduate or postgraduate program. It is directed towards students who know the program but have not had formal exposure to software engineering. The book can also be used by teachers and trainers who are in a similar state—they know some programming but want to be introduced to the systematic approach of software engineering. TABLE OF CONTENTS 1. Introductory Concepts of Software Engineering 2. Modelling Software Development Life Cycle 3. Software Requirement Analysis and Specification 4. Software Project Management Framework 5. Software Project Analysis and Design 6. Object-Oriented Analysis and Design 7. Designing Interfaces & Dialogues and Database Design 8. Coding and Debugging 9. Software Testing 10. System Implementation and Maintenance 11.Reliability 12. Software Quality 13. CASE and Reuse 14. Recent Trends and Development in Software Engineering 15. Model Questions with Answers

Project-based Software Engineering Dec 11 2020 Project-Based Software Engineering is the first book to provide hands-on process and practice in software engineering essentials for the beginner. The book presents steps through the software development life cycle and two running case studies that develop as the steps are presented. Running parallel to the process presentation and case studies, the book supports a semester-long software development project. This book focuses on object-oriented software development, and supports the conceptualization, analysis, design and implementation of an object-oriented project. It is mostly language-independent, with necessary code examples in Java. A subset of UML is used, with the notation explained as needed to support the readers' work. Two running case studies a video game and a library check out system show the development of a software project. Both have sample deliverables and thus provide the reader with examples of the type of work readers are to create. This book is appropriate for readers looking to gain experience in project analysis, design implementation, and testing.

Software Engineering Techniques Applied to Agricultural Systems May 16 2021 Software Engineering Techniques Applied to Agricultural Systems presents cutting-edge software engineering techniques for designing and implementing better agricultural software systems based on the object-oriented paradigm and the Unified Modeling Language (UML). The book is divided in two parts: the first part presents concepts of the object-oriented paradigm and the UML notation of these concepts, and the second part provides a number of examples of applications that use the material presented in the first part. The examples presented illustrate the techniques discussed, focusing on how to construct better models using objects and UML diagrams. More advanced concepts such as distributed systems and examples of how to build these systems are presented in the last chapter of the book. The book presents a step-by-step approach for modeling agricultural systems, starting with a conceptual diagram representing

elements of the system and their relationships. Furthermore, diagrams such as sequential and collaboration diagrams are used to explain the dynamic and static aspects of the software system.

Software Engineering Oct 01 2022 Our new Indian original book on software engineering covers conventional as well as current methodologies of software development to explain core concepts, with a number of case studies and worked-out examples interspersed among the chapters. Current industry practices followed in development, such as computer aided software engineering, have also been included, as are important topics like 'Widget based GUI' and 'Windows Management System'. The book also has coverage on interdisciplinary topics in software engineering that will be useful for software professionals, such as 'quality management', 'project management', 'metrics' and 'quality standards'. Features Covers both function oriented as well as object oriented (OO) approach Emphasis on emerging areas such as 'Web engineering', 'software maintenance' and 'component based software engineering' A number of line diagrams and examples Case Studies on the ATM system and milk dispenser Includes multiple-choice, objective-type questions and frequently asked questions with answers.

Statistical Methods in Software Engineering Aug 26 2019 In establishing a framework for dealing with uncertainties in software engineering, and for using quantitative measures in related decision-making, this text puts into perspective the large body of work having statistical content that is relevant to software engineering. Aimed at computer scientists, software engineers, and reliability analysts who have some exposure to probability and statistics, the content is pitched at a level appropriate for research workers in software reliability, and for graduate level courses in applied statistics computer science, operations research, and software engineering.

Object-oriented Software Engineering May 28 2022 Venturing beyond C++ programming, this text shows how to engineer software products using object-oriented principles. It covers gathering requirements, specifying objects, object verification, defining relations between objects, translating object design into code, object testing, and software maintenance.

Software Engineering with B Jul 26 2019 This is the definitive guide to software engineering with B--the generic name for the software development method invented by Jean-Raymond Abrial, and for the language and CASE tool developed by B-Core (UK) Ltd. The B-method is almost unique among formal software development methods in that it uses a single notation for specification, design and programming. Using tutorial examples, this practical guide can be applied to the whole software engineering life cycle. An accompanying disk allows the reader to experiment with program examples. Key features include: Gives a balanced coverage of the B-Method, the abstract machine notation (AMN) and the B-Toolkit Covers the complete software development process from specification through to production of programs Shows how to write informal descriptions of software components as state machines and how to formalize simple state machines using the abstract machine notation Covers the use of the B-Toolkit for entering, committing, analyzing and animating machines and for generating machines from systems definitions Provides a diskette containing the source text of the examples in the book for use with the B-Toolkit Is supported by supplementary material on the World Wide Web 0201403560B04062001

Software Engineering Jun 16 2021 Software engineering is widely recognized as one of the most exciting, stimulating, and profitable research areas, with a

significant practical impact on the software industry. Thus, training future generations of software engineering researchers and bridging the gap between academia and industry are vital to the field. The International Summer School on Software Engineering (ISSSE), which started in 2003, aims to contribute both to training future researchers and to facilitating the exchange of knowledge between academia and industry. This volume consists of chapters originating from a number of tutorial lectures given in 2009, 2010, and 2011 at the International Summer School on Software Engineering, ISSSE, held in Salerno, Italy. The volume has been organized into three parts, focusing on software measurement and empirical software engineering, software analysis, and software management. The topics covered include software architectures, software product lines, model driven software engineering, mechatronic systems, aspect oriented software development, agile development processes, empirical software engineering, software maintenance, impact analysis, traceability management, software testing, and search-based software engineering.

Measure What Matters Nov 09 2020 #1 New York Times Bestseller Legendary venture capitalist John Doerr reveals how the goal-setting system of Objectives and Key Results (OKRs) has helped tech giants from Intel to Google achieve explosive growth—and how it can help any organization thrive. In the fall of 1999, John Doerr met with the founders of a start-up whom he'd just given $12.5 million, the biggest investment of his career. Larry Page and Sergey Brin had amazing technology, entrepreneurial energy, and sky-high ambitions, but no real business plan. For Google to change the world (or even to survive), Page and Brin had to learn how to make tough choices on priorities while keeping their team on track. They'd have to know when to pull the plug on losing propositions, to fail fast. And they needed timely, relevant data to track their progress—to measure what mattered. Doerr taught them about a proven approach to operating excellence: Objectives and Key Results. He had first discovered OKRs in the 1970s as an engineer at Intel, where the legendary Andy Grove ("the greatest manager of his or any era") drove the best-run company Doerr had ever seen. Later, as a venture capitalist, Doerr shared Grove's brainchild with more than fifty companies. Wherever the process was faithfully practiced, it worked. In this goal-setting system, objectives define what we seek to achieve; key results are how those top-priority goals will be attained with specific, measurable actions within a set time frame. Everyone's goals, from entry level to CEO, are transparent to the entire organization. The benefits are profound. OKRs surface an organization's most important work. They focus effort and foster coordination. They keep employees on track. They link objectives across silos to unify and strengthen the entire company. Along the way, OKRs enhance workplace satisfaction and boost retention. In Measure What Matters, Doerr shares a broad range of first-person, behind-the-scenes case studies, with narrators including Bono and Bill Gates, to demonstrate the focus, agility, and explosive growth that OKRs have spurred at so many great organizations. This book will help a new generation of leaders capture the same magic.

Software Engineering for Multi-Agent Systems III Dec 23 2021 This book presents a coherent and well-balanced survey of recent advances in software engineering approaches to the design and analysis of realistic large-scale multi-agent systems (MAS). The chapters included are devoted to various techniques and methods used to cope with the complexity of real-world MAS. The power of agent-based software engineering is illustrated using examples that are

representative of successful applications. The 16 thoroughly reviewed and revised full papers are organized in topical sections on agent methodologies and processes, requirements engineering and software architectures, modeling languages, and dependability and coordination. Most of the papers were initially presented at the 3rd International Workshop on Software Engineering for Large-Scale Multi-agent Systems, SELMAS 2004, held in Edinburgh, UK in May 2004 in association with ICSE 2004. Other papers were invited to complete coverage of all relevant aspects.

Software Engineering for Multi-Agent Systems IV Sep 19 2021 This book presents a coherent, well-balanced survey of recent advances in software engineering approaches to the design and analysis of realistic large-scale multi-agent systems (MAS). The chapters included are devoted to various techniques and methods used to cope with the complexity of real-world MAS. Reflecting the importance of agent properties in today's software systems, the power of agent-based software engineering is illustrated using examples that are representative of successful applications.

Software Engineering for Multi-Agent Systems II Aug 31 2022 This book presents a coherent and well-balanced survey of recent advances in software engineering approaches to the development of realistic multi-agent systems (MAS). In it, the concept of agent-based software engineering is demonstrated through examples that are relevant to and representative of real-world applications. The 15 thoroughly reviewed and revised full papers are organized in topical sections on requirements engineering, software architecture and design, modeling, dependability, and MAS frameworks. Most of the papers were initially presented at the Second International Workshop on Software Engineering for Large-Scale Multi-Agent Systems, SELMAS 2003, held in Portland, Oregon, USA, in May 2003; three papers were added in order to complete the coverage of the relevant topics.

*Software Design Methodology Oct 21 2021 Software Design Methodology explores the theory of software architecture, with particular emphasis on general design principles rather than specific methods. This book provides in depth coverage of large scale software systems and the handling of their design problems. It will help students gain an understanding of the general theory of design methodology, and especially in analysing and evaluating software architectural designs, through the use of case studies and examples, whilst broadening their knowledge of large-scale software systems. This book shows how important factors, such as globalisation, modelling, coding, testing and maintenance, need to be addressed when creating a modern information system. Each chapter contains expected learning outcomes, a summary of key points and exercise questions to test knowledge and skills. Topics range from the basic concepts of design to software design quality; design strategies and processes; and software architectural styles. Theory and practice are reinforced with many worked examples and exercises, plus case studies on extraction of keyword vector from text; design space for user interface architecture; and document editor. Software Design Methodology is intended for IT industry professionals as well as software engineering and computer science undergraduates and graduates on Msc conversion courses. * In depth coverage of large scale software systems and the handling of their design problems * Many worked examples, exercises and case studies to reinforce theory and practice * Gain an understanding of the general theory of design methodology*

Advances in Software Engineering Sep 27 2019 This book contains both relevant real-world research, as well as reviews of different areas of interest in the software engineering literature, such as clone identification. The contents of the various sections will provide a better understanding of known problems and detailed treatment of advanced topics. Consequently, the book consolidates the work and findings from leading researchers in the software research community in key areas such as maintainability, architectural recovery, code analysis, software migration, and tool support.

A Concise Introduction to Software Engineering Mar 02 2020 An introductory course on Software Engineering remains one of the hardest subjects to teach largely because of the wide range of topics the area enc- passes. I have believed for some time that we often tend to teach too many concepts and topics in an introductory course resulting in shallow knowledge and little insight on application of these concepts. And Software Engineering is ?nally about application of concepts to e?ciently engineer good software solutions. Goals I believe that an introductory course on Software Engineering should focus on imparting to students the knowledge and skills that are needed to successfully execute a commercial project of a few person-months e?ort while employing proper practices and techniques. It is worth pointing out that a vast majority of the projects executed in the industry today fall in this scope—executed by a small team over a few months. I also believe that by carefully selecting the concepts and topics, we can, in the course of a semester, achieve this. This is the motivation of this book. The goal of this book is to introduce to the students a limited number of concepts and practices which will achieve the following two objectives: – Teach the student the skills needed to execute a smallish commercial project.

Model-Driven Software Engineering in Practice Jun 24 2019 This book discusses how model-based approaches can improve the daily practice of software professionals. This is known as Model-Driven Software Engineering (MDSE) or, simply, Model-Driven Engineering (MDE). MDSE practices have proved to increase efficiency and effectiveness in software development, as demonstrated by various quantitative and qualitative studies. MDSE adoption in the software industry is foreseen to grow exponentially in the near future, e.g., due to the convergence of software development and business analysis. The aim of this book is to provide you with an agile and flexible tool to introduce you to the MDSE world, thus allowing you to quickly understand its basic principles and techniques and to choose the right set of MDSE instruments for your needs so that you can start to benefit from MDSE right away. The book is organized into two main parts. The first part discusses the foundations of MDSE in terms of basic concepts (i.e., models and transformations), driving principles, application scenarios and current standards, like the well-known MDA initiative proposed by OMG (Object Management Group) as well as the practices on how to integrate MDSE in existing development processes. The second part deals with the technical aspects of MDSE, spanning from the basics on when and how to build a domain-specific modeling language, to the description of Model-to-Text and Model-to-Model transformations, and the tools that support the management of MDSE projects. The book is targeted to a diverse set of readers, spanning: professionals, CTOs, CIOs, and team managers that need to have a bird's eye vision on the matter, so as to take the appropriate decisions when it comes to choosing the best development techniques for their company or team; software

analysts, developers, or designers that expect to use MDSE for improving everyday work productivity, either by applying the basic modeling techniques and notations or by defining new domain-specific modeling languages and applying end-to-end MDSE practices in the software factory; and academic teachers and students to address undergrad and postgrad courses on MDSE. In addition to the contents of the book, more resources are provided on the book's website, including the examples presented in the book. Table of Contents: Introduction / MDSE Principles / MDSE Use Cases / Model-Driven Architecture (MDA) / Integration of MDSE in your Development Process / Modeling Languages at a Glance / Developing your Own Modeling Language / Model-to-Model Transformations / Model-to-Text Transformations / Managing Models / Summary

Requirements Engineering for Software and Systems, Second Edition Nov 21 2021 As requirements engineering continues to be recognized as the key to on-time and on-budget delivery of software and systems projects, many engineering programs have made requirements engineering mandatory in their curriculum. In addition, the wealth of new software tools that have recently emerged is empowering practicing engineers to improve their requirements engineering habits. However, these tools are not easy to use without appropriate training. Filling this need, Requirements Engineering for Software and Systems, Second Edition has been vastly updated and expanded to include about 30 percent new material. In addition to new exercises and updated references in every chapter, this edition updates all chapters with the latest applied research and industry practices. It also presents new material derived from the experiences of professors who have used the text in their classrooms. Improvements to this edition include: An expanded introductory chapter with extensive discussions on requirements analysis, agreement, and consolidation An expanded chapter on requirements engineering for Agile methodologies An expanded chapter on formal methods with new examples An expanded section on requirements traceability An updated and expanded section on requirements engineering tools New exercises including ones suitable for research projects Following in the footsteps of its bestselling predecessor, the text illustrates key ideas associated with requirements engineering using extensive case studies and three common example systems: an airline baggage handling system, a point-of-sale system for a large pet store chain, and a system for a smart home. This edition also includes an example of a wet well pumping system for a wastewater treatment station. With a focus on software-intensive systems, but highly applicable to non-software systems, this text provides a probing and comprehensive review of recent developments in requirements engineering in high integrity systems.

Software Engineering for Science May 04 2020 Software Engineering for Science provides an in-depth collection of peer-reviewed chapters that describe experiences with applying software engineering practices to the development of scientific software. It provides a better understanding of how software engineering is and should be practiced, and which software engineering practices are effective for scientific software. The book starts with a detailed overview of the Scientific Software Lifecycle, and a general overview of the scientific software development process. It highlights key issues commonly arising during scientific software development, as well as solutions to these problems. The second part of the book provides examples of the use of testing in scientific software development, including key issues and challenges. The chapters then describe solutions and case studies aimed at applying testing to

scientific software development efforts. The final part of the book provides examples of applying software engineering techniques to scientific software, including not only computational modeling, but also software for data management and analysis. The authors describe their experiences and lessons learned from developing complex scientific software in different domains. About the Editors Jeffrey Carver is an Associate Professor in the Department of Computer Science at the University of Alabama. He is one of the primary organizers of the workshop series on Software Engineering for Science (http://www.SE4Science.org/workshops). Neil P. Chue Hong is Director of the Software Sustainability Institute at the University of Edinburgh. His research interests include barriers and incentives in research software ecosystems and the role of software as a research object. George K. Thiruvathukal is Professor of Computer Science at Loyola University Chicago and Visiting Faculty at Argonne National Laboratory. His current research is focused on software metrics in open source mathematical and scientific software.

Generative and Transformational Techniques in Software Engineering II Mar 14 2021 The second instance of the international summer school on Generative and Transformational Techniques in Software Engineering (GTTSE 2007) was held in Braga, Portugal, during July 2–7, 2007. This volume contains an augmented selection of the material presented at the school, including full tutorials, short tutorials, and contributions to the participants workshop. The GTTSE summer school series brings together PhD students, lecturers, technology presenters, as well as other researchers and practitioners who are interested in the generation and the transformation of programs, data, models, metamodels, documentation, and entire software systems. This concerns many areas of software engineering: software reverse and re-engineering, model-driven engineering, automated software engineering, generic language technology, to name a few. These areas di?er with regard to the speci?c sorts of metamodels (or grammars, schemas, formats etc.) that underlie the involved artifacts, and with regard to the speci?c techniques that are employed for the generation and the transformation of the artifacts. The ?rst instance of the school was held in 2005 and its proceedings appeared as volume 4143 in the LNCS series.

Site Reliability Engineering Sep 07 2020 In this collection of essays and articles, key members of Google's Site Reliability Team explain how and why their commitment to the entire lifecycle has enabled the company to successfully build, deploy, monitor, and maintain some of the largest software systems in the world.

A Discipline for Software Engineering Jul 18 2021 This new work from Watts Humphrey, author of the influential book, Managing the Software Process, broadens his orderly view of software process management, and lays the foundation for a disciplined approach to software engineering. In his earlier book, the author developed concrete methods for managing software development and maintenance. These methods, now commonly practiced in industry, provide programmers and managers with specific steps they can take to evaluate and improve their software capabilities. In this new book, Humphrey scales those methods down to a personal level, helping software engineers develop the skills and habits needed to plan, track, and analyze large, complex projects. Humphrey and others have used material from this book to train professionals and students around the world in a projects-oriented software engineering course. First establishing the need for discipline in software

engineering, and the benefits to practitioners of learning how to manage their personal software process, Humphrey then develops a model that they can use to monitor, test, and improve their work. Examples drawn from industry enhance the practical focus of the book, while project exercises give readers the opportunity to practice software process management as they learn it. Features: presents concepts and methods for a disciplined software engineering process; scales down industrial practices for planning, tracking, analysis, and defect management to fit the needs of small-scale program development; and shows how small project disciplines provide a solid base for larger projects.

Software Engineering: A Hands-On Approach Oct 28 2019 This textbook provides a progressive approach to the teaching of software engineering. First, readers are introduced to the core concepts of the object-oriented methodology, which is used throughout the book to act as the foundation for software engineering and programming practices, and partly for the software engineering process itself. Then, the processes involved in software engineering are explained in more detail, especially methods and their applications in design, implementation, testing, and measurement, as they relate to software engineering projects. At last, readers are given the chance to practice these concepts by applying commonly used skills and tasks to a hands-on project. The impact of such a format is the potential for quicker and deeper understanding. Readers will master concepts and skills at the most basic levels before continuing to expand on and apply these lessons in later chapters.

Foundations of Software Engineering Apr 02 2020

The Essentials of Modern Software Engineering Jun 04 2020 The first course in software engineering is the most critical. Education must start from an understanding of the heart of software development, from familiar ground that is common to all software development endeavors. This book is an in-depth introduction to software engineering that uses a systematic, universal kernel to teach the essential elements of all software engineering methods. This kernel, Essence, is a vocabulary for defining methods and practices. Essence was envisioned and originally created by Ivar Jacobson and his colleagues, developed by Software Engineering Method and Theory (SEMAT) and approved by The Object Management Group (OMG) as a standard in 2014. Essence is a practice-independent framework for thinking and reasoning about the practices we have and the practices we need. Essence establishes a shared and standard understanding of what is at the heart of software development. Essence is agnostic to any particular method, lifecycle independent, programming language independent, concise, scalable, extensible, and formally specified. Essence frees the practices from their method prisons. The first part of the book describes Essence, the essential elements to work with, the essential things to do and the essential competencies you need when developing software. The other three parts describe more and more advanced use cases of Essence. Using real but manageable examples, it covers the fundamentals of Essence and the innovative use of serious games to support software engineering. It also explains how current practices such as user stories, use cases, Scrum, and micro-services can be described using Essence, and illustrates how their activities can be represented using the Essence notions of cards and checklists. The fourth part of the book offers a vision how Essence can be scaled to support large, complex systems engineering. Essence is supported by an ecosystem developed and maintained by a community of experienced people worldwide. From this

ecosystem, professors and students can select what they need and create their own way of working, thus learning how to create ONE way of working that matches the particular situation and needs.

Analytic Methods in Systems and Software Testing Oct 09 2020 A comprehensive treatment of systems and software testing using state of the art methods and tools This book provides valuable insights into state of the art software testing methods and explains, with examples, the statistical and analytic methods used in this field. Numerous examples are used to provide understanding in applying these methods to real-world problems. Leading authorities in applied statistics, computer science, and software engineering present state-of-the-art methods addressing challenges faced by practitioners and researchers involved in system and software testing. Methods include: machine learning, Bayesian methods, graphical models, experimental design, generalized regression, and reliability modeling. Analytic Methods in Systems and Software Testing presents its comprehensive collection of methods in four parts: Part I: Testing Concepts and Methods; Part II: Statistical Models; Part III: Testing Infrastructures; and Part IV: Testing Applications. It seeks to maintain a focus on analytic methods, while at the same time offering a contextual landscape of modern engineering, in order to introduce related statistical and probabilistic models used in this domain. This makes the book an incredibly useful tool, offering interesting insights on challenges in the field for researchers and practitioners alike. Compiles cutting-edge methods and examples of analytical approaches to systems and software testing from leading authorities in applied statistics, computer science, and software engineering Combines methods and examples focused on the analytic aspects of systems and software testing Covers logistic regression, machine learning, Bayesian methods, graphical models, experimental design, generalized regression, and reliability models Written by leading researchers and practitioners in the field, from diverse backgrounds including research, business, government, and consulting Stimulates research at the theoretical and practical level Analytic Methods in Systems and Software Testing is an excellent advanced reference directed toward industrial and academic readers whose work in systems and software development approaches or surpasses existing frontiers of testing and validation procedures. It will also be valuable to post-graduate students in computer science and mathematics.

Software Engineering Dec 31 2019 This introduction to software engineering and practice addresses both procedural and object-oriented development.Is thoroughly updated to reflect significant changes in software engineering, including modeling and agile methods. Emphasizes essential role of modeling design in software engineering. Applies concepts consistently to two common examples a typical information system and a real-time system. Combines theory with real, practical applications by providing an abundance of case studies and examples from the current literature.A useful reference for software engineers.

Software Engineering for Real-time Systems Aug 19 2021 The comprehensive coverage and real-world perspective makes the book accessible and appealing to both beginners and experienced designers. Covers both the fundamentals of software design and modern design methodologies Provides comparisons of different development methods, tools and languages Blends theory and practical experience together Emphasises the use of diagrams and is highly illustrated

Experimentation in Software Engineering Feb 22 2022 Like other sciences and

engineering disciplines, software engineering requires a cycle of model building, experimentation, and learning. Experiments are valuable tools for all software engineers who are involved in evaluating and choosing between different methods, techniques, languages and tools. The purpose of Experimentation in Software Engineering is to introduce students, teachers, researchers, and practitioners to empirical studies in software engineering, using controlled experiments. The introduction to experimentation is provided through a process perspective, and the focus is on the steps that we have to go through to perform an experiment. The book is divided into three parts. The first part provides a background of theories and methods used in experimentation. Part II then devotes one chapter to each of the five experiment steps: scoping, planning, execution, analysis, and result presentation. Part III completes the presentation with two examples. Assignments and statistical material are provided in appendixes. Overall the book provides indispensable information regarding empirical studies in particular for experiments, but also for case studies, systematic literature reviews, and surveys. It is a revision of the authors' book, which was published in 2000. In addition, substantial new material, e.g. concerning systematic literature reviews and case study research, is introduced. The book is self-contained and it is suitable as a course book in undergraduate or graduate studies where the need for empirical studies in software engineering is stressed. Exercises and assignments are included to combine the more theoretical material with practical aspects. Researchers will also benefit from the book, learning more about how to conduct empirical studies, and likewise practitioners may use it as a "cookbook" when evaluating new methods or techniques before implementing them in their organization.

Formal Methods for Software Engineering Jan 30 2020 Software programs are formal entities with precise meanings independent of their programmers, so the transition from ideas to programs necessarily involves a formalisation at some point. The first part of this graduate-level introduction to formal methods develops an understanding of what constitutes formal methods and what their place is in Software Engineering. It also introduces logics as languages to describe reasoning and the process algebra CSP as a language to represent behaviours. The second part offers specification and testing methods for formal development of software, based on the modelling languages CASL and UML. The third part takes the reader into the application domains of normative documents, human machine interfaces, and security. Use of notations and formalisms is uniform throughout the book. Topics and features: Explains foundations, and introduces specification, verification, and testing methods Explores various application domains Presents realistic and practical examples, illustrating concepts Brings together contributions from highly experienced educators and researchers Offers modelling and analysis methods for formal development of software Suitable for graduate and undergraduate courses in software engineering, this uniquely practical textbook will also be of value to students in informatics, as well as to scientists and practical engineers, who want to learn about or work more effectively with formal theories and methods. Markus Roggenbach is a Professor in the Dept. of Computer Science of Swansea University. Antonio Cerone is an Associate Professor in the Dept. of Computer Science of Nazarbayev University, Nur-Sultan. Bernd-Holger Schlingloff is a Professor in the Institut für Informatik of Humboldt-Universität zu Berlin. Gerardo Schneider is a Professor in the Dept. of Computer Science and

Engineering of University of Gothenburg. Siraj Ahmed Shaikh is a Professor in the Institute for Future Transport and Cities of Coventry University.

Case Study Research in Software Engineering Nov 02 2022 Based on their own experiences of in-depth case studies of softwareprojects in international corporations, in this book theauthors present detailed practical guidelines on the preparation,conduct, design and reporting of case studies of softwareengineering. This is the first software engineering specificbook on the case study research method.

Agent-Oriented Software Engineering XI Aug 07 2020 Since the mid 1980s, software agents and multi-agent systems have grown into a very active area of research and also commercial development activity. One of the limiting factors in industry take-up of agent-technology, however, is the lack of adequate software engineering support. The Agent-Oriented Software Engineering Workshop, AOSE, focuses on the synergies and cross fertilization between software engineering and agent research. This volume presents both thoroughly revised selected papers from the AOSE 2010 workshop held at AAMAS 2010 in Toronto, Canada in May 2010 as well as invited articles by leading researchers in the field. The papers cover a broad range of topics related to software engineering and agent-based systems, with particular attention to the integration of concepts and techniques from multi-agent systems with conventional engineering approaches on the one hand, and to the integration of agent-oriented software engineering and methodologies with conventional engineering processes on the other hand.

Basics of Software Engineering Experimentation Jun 28 2022 Basics of Software Engineering Experimentation is a practical guide to experimentation in a field which has long been underpinned by suppositions, assumptions, speculations and beliefs. It demonstrates to software engineers how Experimental Design and Analysis can be used to validate their beliefs and ideas. The book does not assume its readers have an in-depth knowledge of mathematics, specifying the conceptual essence of the techniques to use in the design and analysis of experiments and keeping the mathematical calculations clear and simple. Basics of Software Engineering Experimentation is practically oriented and is specially written for software engineers, all the examples being based on real and fictitious software engineering experiments.

Software Engineering Education in the Modern Age Jul 06 2020 This tutorial book presents an augmented selection of the material presented at the Software Engineering Education and Training Track at the International Conference on Software Engineering, ICSE 2005, held in St. Louis, MO, USA in May 2005. The 12 tutorial lectures presented cover software engineering education, state of the art and practice: creativity and rigor, challenges for industries and academia, as well as future directions.

Software Engineering at Google Apr 26 2022 Today, software engineers need to know not only how to program effectively but also how to develop proper engineering practices to make their codebase sustainable and healthy. This book emphasizes this difference between programming and software engineering. How can software engineers manage a living codebase that evolves and responds to changing requirements and demands over the length of its life? Based on their experience at Google, software engineers Titus Winters and Hyrum Wright, along with technical writer Tom Manshreck, present a candid and insightful look at how some of the world's leading practitioners construct and maintain software.

This book covers Google's unique engineering culture, processes, and tools and how these aspects contribute to the effectiveness of an engineering organization. You'll explore three fundamental principles that software organizations should keep in mind when designing, architecting, writing, and maintaining code: How time affects the sustainability of software and how to make your code resilient over time How scale affects the viability of software practices within an engineering organization What trade-offs a typical engineer needs to make when evaluating design and development decisions

Software Engineering with Reusable Components Apr 14 2021 The book provides a clear understanding of what software reuse is, where the problems are, what benefits to expect, the activities, and its different forms. The reader is also given an overview of what sofware components are, different kinds of components and compositions, a taxonomy thereof, and examples of successful component reuse. An introduction to software engineering and software process models is also provided.

Object-Oriented Software Engineering Mar 26 2022

How to Engineer Software Jan 24 2022 A guide to the application of the theory and practice of computing to develop and maintain software that economically solves real-world problem How to Engineer Software is a practical, how-to guide that explores the concepts and techniques of model-based software engineering using the Unified Modeling Language. The author—a noted expert on the topic—demonstrates how software can be developed and maintained under a true engineering discipline. He describes the relevant software engineering practices that are grounded in Computer Science and Discrete Mathematics. Model-based software engineering uses semantic modeling to reveal as many precise requirements as possible. This approach separates business complexities from technology complexities, and gives developers the most freedom in finding optimal designs and code. The book promotes development scalability through domain partitioning and subdomain partitioning. It also explores software documentation that specifically and intentionally adds value for development and maintenance. This important book: Contains many illustrative examples of model-based software engineering, from semantic model all the way to executable code Explains how to derive verification (acceptance) test cases from a semantic model Describes project estimation, along with alternative software development and maintenance processes Shows how to develop and maintain cost-effective software that solves real-world problems Written for graduate and undergraduate students in software engineering and professionals in the field, How to Engineer Software offers an introduction to applying the theory of computing with practice and judgment in order to economically develop and maintain software.