Software Engineering We

Perspectives on Data Science for Software EngineeringPerspectives on the Future of Software EngineeringExtreme Programming and Agile Processes in Software EngineeringComponent-Based Software EngineeringKnowledge-Based Software EngineeringCase Study Research in Software EngineeringSoftware Engineering 1Essentials of Software EngineeringDomain Modeling-Based Software EngineeringSoftware Engineering And Quality AssuranceExperimentation in Software EngineeringCreating a Software Engineering CultureArtificial Intelligence and Software EngineeringSoftware Engineering 2Essentials of Software EngineeringSoftware EngineeringSoftware Engineering EducationSoftware Engineering: Effective Teaching and Learning Approaches and PracticesSoftware Engineering with Reusable ComponentsAgile Software EngineeringSoftware Engineering MeasurementOntologies for Software Engineering and Software TechnologySoftware Engineering and Computer Systems, Part II Am a Software Engineer and I Am in ChargeHuman-Centered Software Engineering - Integrating Usability in the Software Development LifecycleBuilding Tightly Integrated Software Development Environments: The IPSEN ApproachFundamental Approaches to Software EngineeringCleanroom Software EngineeringIntroduction to Software EngineeringSoftware Engineering at GoogleSoftware EngineeringThe Future of Software EngineeringBioinformatics Software EngineeringDesign Science Methodology for Information Systems and Software EngineeringSoftware EngineeringStatistical Methods in Software EngineeringKnowledge-Based Software EngineeringAgile Processes in Software Engineering and Extreme ProgrammingFoundations of Software EngineeringFacts and Fallacies of Software Engineering

Perspectives on Data Science for Software Engineering

Perspectives on Data Science for Software Engineering presents the best practices of seasoned data miners in software engineering. The idea for this book was created during the 2014 conference at Dagstuhl, an invitation-only gathering of leading computer scientists who meet to identify and discuss cutting-edge informatics topics. At the 2014 conference, the concept of how to transfer the knowledge of experts from seasoned software engineers and data scientists to newcomers in the field highlighted many discussions. While there are many books covering data mining and software engineering basics, they present only the fundamentals and lack the perspective that comes from real-world experience. This book offers unique insights into the wisdom of the community's leaders gathered to share hard-won lessons from the trenches. Ideas are presented in digestible chapters designed to be applicable across many domains. Topics included cover data collection, data sharing, data mining, and how to utilize these techniques in successful software projects. Newcomers to software engineering data science will learn the tips and tricks of the trade, while more experienced data scientists will benefit from war stories that show what traps to avoid. Presents the wisdom of community experts, derived from a summit on software analytics Provides contributed chapters that share discrete ideas and technique from the trenches Covers top areas of concern, including mining security and social data, data visualization, and cloud-based data Presented in clear chapters designed to

be applicable across many domains

Perspectives on the Future of Software Engineering

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.

Extreme Programming and Agile Processes in Software Engineering

This book covers two applications of ontologies in software engineering and software technology: sharing knowledge of the problem domain and using a common terminology among all stakeholders; and filtering the knowledge when defining models and metamodels. By presenting the advanced use of ontologies in software research and software projects, this book is of benefit to software engineering researchers in both academia and industry.

Component-Based Software Engineering

ETAPS 2001 is the fourth instance of the European Joint Conferences on Theory and Practice of Software. ETAPS is an annual federated conference that was established in 1998 by combining a number of existing and new conferences. This year it comprises ve conferences (FOSSACS, FASE, ESOP, CC, TACAS), ten satellite workshops (CMCS, ETI Day, JOSES, LDTA, MMAABS, PFM, RelMiS, UNIGRA, WADT, WTUML), seven invited lectures, a debate, and ten tutorials. The events that comprise ETAPS address various aspects of the system - velopment process,

including speci cation, design, implementation, analysis and improvement. The languages, methodologies and tools which support these - tivities are all well within its scope. Di erent blends of theory and practice are represented, with an inclination towards theory with a practical motivation on one hand and soundly-based practice on the other. Many of the issues involved in software design apply to systems in general, including hardware systems, and the emphasis on software is not intended to be exclusive.

Knowledge-Based Software Engineering

The book captures the latest developments in the areas of knowledge engineering and software engineering. Particular emphasis is placed upon applying knowledge-based methods to software engineering problems. The Conference, from which the papers are coming, originated in order to provide a forum in which the latest developments in the field of knowledge-based software engineering could be discussed. Although initially targeting scientists from Japan, the CIS countries and countries in Central and Eastern Europe, the authors come from many countries throughout the world. JCKBSE 2002 continues with this tradition and is anticipating even wider international participation. Furthermore, the scope of the conference as indicated by its topics has been updated to reflect the recent development in all the three covered areas, i.e. knowledge engineering, software engineering, and knowledge based software engineering

Case Study Research in Software Engineering

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.

Software Engineering 1

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

Essentials of Software Engineering

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.

Domain Modeling-Based Software Engineering

The dependence on quality software in all areas of life is what makes software engineering a key discipline for today's society. Thus, over the last few decades it has been increasingly recognized that it is particularly important to demonstrate the value of software engineering methods in real-world environments, a task which is the focus of empirical software engineering. One of the leading protagonists of this discipline worldwide is Prof. Dr. Dr. h.c. Dieter Rombach, who dedicated his entire career to empirical software engineering. For his many important contributions to the field he has received numerous awards and recognitions, including the U.S. National Science Foundation's Presidential Young Investigator Award and the Cross of the Order of Merit of the Federal Republic of Germany. He is a Fellow of both the ACM and the IEEE Computer Society. This book, published in honor of his 60th birthday, is dedicated to Dieter Rombach and his contributions to software engineering in general, as well as to empirical software engineering in particular. This book presents invited contributions from a number of the most internationally renowned software engineering researchers like Victor Basili, Barry Boehm, Manfred Broy, Carlo Ghezzi, Michael Jackson, Leon Osterweil, and, of course, by Dieter Rombach himself. Several key experts from the Fraunhofer IESE, the institute founded and led by Dieter Rombach, also contributed to the book. The contributions summarize some of the most important trends in software engineering today and outline a vision for the future of the field. The book is structured into three main parts. The first part focuses on the classical foundations of software engineering, such as notations, architecture, and processes, while the second addresses empirical software engineering in particular as the core field of Dieter Rombach's contributions. Finally, the third part discusses a broad vision for the future of software engineering.

Software Engineering And Quality Assurance

The art, craft, discipline, logic, practice, and science of developing large-scale software products needs a believable, professional base. The textbooks in this three-volume set combine informal, engineeringly sound practice with the rigour of formal, mathematics-based approaches. Volume 1 covers the basic principles and techniques of formal methods abstraction and modelling. First this book provides a sound, but simple basis of insight into discrete mathematics: numbers, sets, Cartesians, types, functions, the Lambda Calculus, algebras, and mathematical logic. Then it trains its readers in basic property- and model-oriented specification

principles and techniques. The model-oriented concepts that are common to such specification languages as B, VDM-SL, and Z are explained here using the RAISE specification language (RSL). This book then covers the basic principles of applicative (functional), imperative, and concurrent (parallel) specification programming. Finally, the volume contains a comprehensive glossary of software engineering, and extensive indexes and references. These volumes are suitable for self-study by practicing software engineers and for use in university undergraduate and graduate courses on software engineering. Lecturers will be supported with a comprehensive guide to designing modules based on the textbooks, with solutions to many of the exercises presented, and with a complete set of lecture slides.

Experimentation in Software Engineering

Human-CenteredSoftwareEngineering: BridgingHCI,UsabilityandSoftwareEngineering From its beginning in the 1980's, the ?eld of human-computer interaction (HCI) has beende?nedasamultidisciplinaryarena. BythisImeanthattherehas beenanexplicit recognition that distinct skills and perspectives are required to make the whole effort of designing usable computer systems work well. Thus people with backgrounds in Computer Science (CS) and Software Engineering (SE) joined with people with ba- grounds in various behavioral science disciplines (e. g. , cognitive and social psych- ogy, anthropology)inaneffortwhereallperspectiveswereseenasessentialtocreating usable systems. But while the ?eld of HCI brings individuals with many background disciplines together to discuss a common goal - the development of useful, usable, satisfying systems - the form of the collaboration remains unclear. Are we striving to coordinate the varied activities in system development, or are we seeking a richer collaborative framework? In coordination, Usability and SE skills can remain quite distinct and while the activities of each group might be critical to the success of a project, we need only insure that critical results are provided at appropriate points in the development cycle. Communication by one group to the other during an activity might be seen as only minimally necessary. In collaboration, there is a sense that each group can learn something about its own methods and processes through a close pa- nership with the other. Communication during the process of gathering information from target users of a system by usability professionals would not be seen as so- thing that gets in the way of the essential work of software engineering professionals.

Creating a Software Engineering Culture

This Three-Volume-Set constitutes the refereed proceedings of the Second International Conference on Software Engineering and Computer Systems, ICSECS 2011, held in Kuantan, Malaysia, in June 2011. The 190 revised full papers presented together with invited papers in the three volumes were carefully reviewed and selected from numerous submissions. The papers are organized in topical sections on software engineering; network; bioinformatics and e-health; biometrics technologies; Web engineering; neural network; parallel and distributed; e-learning; ontology; image processing; information and data management; engineering; software security; graphics and multimedia; databases; algorithms; signal processing; software design/testing; e- technology; ad hoc networks; social

networks; software process modeling; miscellaneous topics in software engineering and computer systems.

Artificial Intelligence and Software Engineering

Many approaches have been proposed to enhance software productivity and reliability. These approaches typically fall into three categories: the engineering approach, the formal approach, and the knowledge-based approach. The optimal gain in software productivity cannot be obtained if one relies on only one of these approaches. Thus, the integration of different approaches has also become a major area of research. No approach can be said to be perfect if it fails to satisfy the following two criteria. Firstly, a good approach should support the full life cycle of software development. Secondly, a good approach should support the development of large-scale software for real use in many application domains. Such an approach can be referred to as a five-in-one approach. The authors of this book have, for the past eight years, conducted research in knowledge-based software engineering, of which the final goal is to develop a paradigm for software engineering which not only integrates the three approaches mentioned above, but also fulfils the two criteria on which the five-in-one approach is based. Domain Modeling- Based Software Engineering: A Formal Approach explores the results of this research. Domain Modeling-Based Software Engineering: A Formal Approach will be useful to researchers of knowledge-based software engineering, students and instructors of computer science, and software engineers who are working on large-scale projects of software development and want to use knowledge-based development methods in their work.

Software Engineering 2

Essentials of Software Engineering

Software Engineering

I am a Software Engineer and I am in Charge is a real-world, practical book that helps you increase your impact and satisfaction at work no matter who you work with.Each of the 7 chapters has the following structure specifically designed to generate insight and move you to action.Why it mattersA brief introduction to the chapter that offers questions for you to experiment with your current belief about the topic of the chapter. For example, if you believe you can't ask a colleague you admire to be your mentor, then what could you do if you changed that belief?The storyA fictional story following the protagonist, Sandrine who left her company to get a higher-level role and found that despite the "promotion" everything still feels the same, the people around her are clueless.In each chapter, Sandrine learns something from the people she interacts with that gets her thinking in a new way enabling her to take different actions.Sandrine is not perfect though, she makes slip-ups, promises to change but goes back to old habits, plans for things a certain way only to discover it doesn't play out that way-just like in real life.What do we learn from the storyHere we talk about the lesson from the story, and ask you, the

reader, what you will do with your new knowledge and insights.The experimentsAt the end of each chapter, there are 3 experiments for you to try. You can choose to do one or more of them to see what happens when you put yourself in Sandrine's shoes.Follow Sandrine on her journey to see for yourself how she solved her problems and increased her impact and satisfaction and in the process find a way to increase yours.By the end of the book you'll have learned: How your words influence your actionsHow to prosper from feedbackHow to set goals that inspireHow to work with others to create a better solutionHow to use failure as a data point to inform your learnin

Software Engineering Education

The art, craft, discipline, logic, practice and science of developing large-scale software products needs a professional base. The textbooks in this three-volume set combine informal, engineeringly sound approaches with the rigor of formal, mathematics-based approaches. This volume covers the basic principles and techniques of specifying systems and languages. It deals with modelling the semiotics (pragmatics, semantics and syntax of systems and languages), modelling spatial and simple temporal phenomena, and such specialized topics as modularity (incl. UML class diagrams), Petri nets, live sequence charts, statecharts, and temporal logics, including the duration calculus. Finally, the book presents techniques for interpreter and compiler development of functional, imperative, modular and parallel programming languages. This book is targeted at late undergraduate to early graduate university students, and researchers of programming methodologies. Vol. 1 of this series is a prerequisite text.

Software Engineering: Effective Teaching and Learning Approaches and Practices

Cleanroom software engineering is a process for developing and certifying high-reliability software. Combining theory-based engineering technologies in project management, incremental development, software specification and design, correctness verification, and statistical quality certification, the Cleanroom process answers today's call for more reliable software and provides methods for more cost-effective software development. Cleanroom originated with Harlan D. Mills, an IBM Fellow and a visionary in software engineering. Written by colleagues of Mills and some of the most experienced developers and practitioners of Cleanroom, Cleanroom Software Engineering provides a roadmap for software management, development, and testing as disciplined engineering practices. This book serves both as an introduction for those new to Cleanroom and as a reference guide for the growing practitioner community. Readers will discover a proven way to raise both quality and productivity in their software-intensive products, while reducing costs. Highlights Explains basic Cleanroom theory Introduces the sequence-based specification method Elaborates the full management, development, and certification process in a Cleanroom Reference Model (CRM) Shows how the Cleanroom process dovetails with the SEI's Capability Maturity Model for Software (CMM) Includes a large case study to illustrate how Cleanroom methods scale up to large projects.

Software Engineering with Reusable Components

As knowledge-based software engineering matures and increasingly automates the software engineering life cycle, software engineering resources are shifting towards knowledge acquisition and the automated reuse of expert knowledge for developing software artifacts. This book summarizes the work and new research results presented at the Tenth Joint Conference on Knowledge-based Software Engineering (JCKBSE 2012), held on the island of Rhodes, Greece, in August 2012. The biennial Joint Conference on Knowledge-Based Software Engineering brings together researchers and practitioners to share ideas on the foundations, techniques, tools, and applications of knowledge-based software engineering theory and practice. Topics addressed include theoretical foundations, practical techniques, software tools, applications and/or experience reports in knowledge-based software engineering. This book is published in the subseries Knowledge-Based Intelligent Engineering Systems (KBIES).

Agile Software Engineering

This is the most authoritative archive of Barry Boehm's contributions to software engineering. Featuring 42 reprinted articles, along with an introduction and chapter summaries to provide context, it serves as a "how-to" reference manual for software engineering best practices. It provides convenient access to Boehm's landmark work on product development and management processes. The book concludes with an insightful look to the future by Dr. Boehm.

Software Engineering Measurement

This book focuses on defining the achievements of software engineering in the past decades and showcasing visions for the future. It features a collection of articles by some of the most prominent researchers and technologists who have shaped the field: Barry Boehm, Manfred Broy, Patrick Cousot, Erich Gamma, Yuri Gurevich, Tony Hoare, Michael A. Jackson, Rustan Leino, David L. Parnas, Dieter Rombach, Joseph Sifakis, Niklaus Wirth, Pamela Zave, and Andreas Zeller. The contributed articles reflect the authors' individual views on what constitutes the most important issues facing software development. Both research- and technology-oriented contributions are included. The book provides at the same time a record of a symposium held at ETH Zurich on the occasion of Bertrand Meyer's 60th birthday.

Ontologies for Software Engineering and Software Technology

This volume contains the proceedings of the 1988 SEI Conference on Software Engineering Education. The Software Engineering Institute (SEI) is a United States government-funded research and development center operated by Carnegie Mellon University. Its principal responsibility is to accelerate the reduction to practice of modern software engineering techniques and methods. An annual activity of the SEI is the SEI Conference on Software Engineering Education. The purpose of the conference is to promote enhanced software engineering education in the academic, industrial, and government educational communities, and to

promote interactions among educators in these three communities. The 1988 conference included refereed papers, panel discussions, reports and demonstrations from the SEI. Special emphasis was placed on master's degree level software engineering curricula, the content of software engineering courses, and the introduction of software engineering into undergraduate computer science curricula. The proceedings contain fifteen refereed papers, the keynote address, and a report on curriculum recommendations from the SEI. This volume is particularly useful to software engineering and computer science educators in both the academic and industrial communities.

Software Engineering and Computer Systems, Part I

The XP conference series established in 2000 was the first conference dedicated to agile processes in software engineering. The idea of the conference is to offer a unique setting for advancing the state of the art in the research and practice of agile processes. This year's conference was the ninth consecutive edition of this international event. The conference has grown to be the largest conference on agile software development outside North America. The XP conference enjoys being one of those conferences that truly brings practitioners and academics together. About 70% of XP participants come from industry and the number of academics has grown steadily over the years. XP is more of an experience rather than a regular conference. It offers several different ways to interact and strives to create a truly collaborative environment where new ideas and exciting findings can be presented and shared. For example, this year's open space session, which was "a conference within a conference", was larger than ever before. Agile software development is a unique phenomenon from several perspectives.

I Am a Software Engineer and I Am in Charge

Providing all the latest on a topic of extreme commercial relevance, this book contains the refereed proceedings of the 10th International ACM SIGSOFT Symposium on Component-Based Software Engineering, held in Medford, MA, USA in July 2007. The 19 revised full papers presented were carefully reviewed and selected from 89 submissions. The papers feature new trends in global software services and distributed systems architectures to push the limits of established and tested component-based methods, tools and platforms.

Human-Centered Software Engineering - Integrating Usability in the Software Development Lifecycle

This coherently written book is the final report on the IPSEN project on Integrated Software Project Support Environments devoted to the integration of tools for the development and maintenance of large software systems. The theoretical and application-oriented findings of this comprehensive project are presented in the following chapters: Overview: introduction, classification, and global approach; The outside perspective: tools, environments, their integration, and user interface; Internal conceptual modeling: graph grammar specifications; Realization: derivation of efficient tools, Current and future work, open problems; Conclusion: summary, evaluation, and vision. Also included is a comprehensive bibliography

listing more than 1300 entries and a detailed index.

Building Tightly Integrated Software Development Environments: The IPSEN Approach

Software engineering lies at the heart of the computer revolution. Software is used in automobiles, airplanes, and many home appliances. As the boundaries between the telecommunications, entertainment, and computer industries continue to blur in multimedia and networking, the need for software will only increase, and software will become increasingly complex. Introduction to Software Engineering gives your students the fundamentals of this growing and rapidly changing field. The book highlights the goals of software engineering, namely to write programs that have all the following attributes: efficient, reliable, usable, modifiable, portable, testable, reusable, maintainable, compatible and correct. The nine chapters cover topics that include project management, defining requirements, software design, coding, testing and integration, delivery and installation, documentation, maintenance, and research issues. The author uses a hybrid approach, combining object-oriented technology and classical programming techniques to solve computing problems. He also places a strong emphasis on Internet technology and resources. A simple, but non-trivial, running example illustrates all stages of the software engineering process. In addition, where applicable, he covers the impact of Internet technology. Introduction to Software Engineering presents the basics of software engineering in a concise and direct format. With emphasis on Internet technology, software tools for programming, and hands-on learning, this book effectively prepares students to move from an educational situation towards applying their knowledge to the complex projects faced in the professional arena. Features

Fundamental Approaches to Software Engineering

First published in 1998. Routledge is an imprint of Taylor & Francis, an informa company.

Cleanroom Software Engineering

The best way to learn software engineering is by understanding its core and peripheral areas. Foundations of Software Engineering provides in-depth coverage of the areas of software engineering that are essential for becoming proficient in the field. The book devotes a complete chapter to each of the core areas. Several peripheral areas are also explained by assigning a separate chapter to each of them. Rather than using UML or other formal notations, the content in this book is explained in easy-to-understand language. Basic programming knowledge using an object-oriented language is helpful to understand the material in this book. The knowledge gained from this book can be readily used in other relevant courses or in real-world software development environments. This textbook educates students in software engineering principles. It covers almost all facets of software engineering, including requirement engineering, system specifications, system modeling, system architecture, system implementation, and system testing. Emphasizing practical issues, such as feasibility studies, this book explains how to

add and develop software requirements to evolve software systems. This book was written after receiving feedback from several professors and software engineers. What resulted is a textbook on software engineering that not only covers the theory of software engineering but also presents real-world insights to aid students in proper implementation. Students learn key concepts through carefully explained and illustrated theories, as well as concrete examples and a complete case study using Java. Source code is also available on the book's website. The examples and case studies increase in complexity as the book progresses to help students build a practical understanding of the required theories and applications.

Introduction to Software Engineering

Computer Architecture/Software Engineering

Software Engineering at Google

This book provides guidelines for practicing design science in the fields of information systems and software engineering research. A design process usually iterates over two activities: first designing an artifact that improves something for stakeholders and subsequently empirically investigating the performance of that artifact in its context. This "validation in context" is a key feature of the book - since an artifact is designed for a context, it should also be validated in this context. The book is divided into five parts. Part I discusses the fundamental nature of design science and its artifacts, as well as related design research questions and goals. Part II deals with the design cycle, i.e. the creation, design and validation of artifacts based on requirements and stakeholder goals. To elaborate this further, Part III presents the role of conceptual frameworks and theories in design science. Part IV continues with the empirical cycle to investigate artifacts in context, and presents the different elements of research problem analysis, research setup and data analysis. Finally, Part V deals with the practical application of the empirical cycle by presenting in detail various research methods, including observational case studies, case-based and sample-based experiments and technical action research. These main sections are complemented by two generic checklists, one for the design cycle and one for the empirical cycle. The book is written for students as well as academic and industrial researchers in software engineering or information systems. It provides guidelines on how to effectively structure research goals, how to analyze research problems concerning design goals and knowledge questions, how to validate artifact designs and how to empirically investigate artifacts in context – and finally how to present the results of the design cycle as a whole.

Software Engineering

Computer Architecture/Software Engineering

The Future of Software Engineering

Over the past decade, software engineering has developed into a highly respected field. Though computing and software engineering education continues to emerge

as a prominent interest area of study, few books specifically focus on software engineering education itself. Software Engineering: Effective Teaching and Learning Approaches and Practices presents the latest developments in software engineering education, drawing contributions from over 20 software engineering educators from around the globe. Encompassing areas such as student assessment and learning, innovative teaching methods, and educational technology, this much-needed book greatly enhances libraries with its unique research content.

Bioinformatics Software Engineering

PLEASE PROVIDE SUMMARY

Design Science Methodology for Information Systems and Software Engineering

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.

Software Engineering

This Book Is Designed As A Textbook For The First Course In Software Engineering For Undergraduate And Postgraduate Students. This May Also Be Helpful For Software Professionals To Help Them Practice The Software Engineering Concepts.The Second Edition Is An Attempt To Bridge The Gap Between What Is Taught In The Classroom And What Is Practiced In The Industry . The Concepts Are Discussed With The Help Of Real Life Examples And Numerical Problems.This Book Explains The Basic Principles Of Software Engineering In A Clear And Systematic Manner. A Contemporary Approach Is Adopted Throughout The Book. After Introducing The Fundamental Concepts, The Book Presents A Detailed Discussion Of Software Requirements Analysis & Specifications. Various Norms And Models Of Software Project Planning Are Discussed Next, Followed By A Comprehensive Account Of Software Metrics.Suitable Examples, Illustrations, Exercises, Multiple Choice Questions And Answers Are Included Throughout The Book To Facilitate An Easier Understanding Of The Subject.

Statistical Methods in Software Engineering

The product of many years of practical experience and research in the software measurement business, this technical reference helps you select what metrics to collect, how to convert measurement data to management information, and provides the statistics necessary to perform these conversions. The author explains how to manage software development measurement systems, how to build software measurement tools and standards, and how to construct controlled

experiments using standardized measurement tools. There are three fundamental questions that this book seeks to answer. First, exactly how do you get the measurement data? Second, how do you convert the data from the measurement process to information that you can use to manage the software development process? Third, how do you manage all of the data? Millions of dollars are being spent trying to secure software systems. When suitable instrumentation is placed into the systems that we develop, their activity can be monitored in real time. Measurement based automatic detection mechanisms can be designed into systems. This will permit the detection of system misuse and detect incipient reliability problems. By demonstrating how to develop simple experiments for the empirical validation of theoretical research and showing how to convert measurement data into meaningful and valuable information, this text fosters more precise use of software measurement in the computer science and software engineering literature. Software Engineering Measurement shows you how to convert your measurement data to valuable information that can be used immediately for software process improvement.

Knowledge-Based Software Engineering

Bioinformatics Software Engineering: Delivering Effective Applications will be useful to anyone who wants to understand how successful software can be developed in a rapidly changing environment. A handbook, not a textbook, it is not tied to any particular operating system, platform, language, or methodology. Instead it focuses on principles and practices that have been proven in the real world. It is pragmatic, emphasizing the importance of what the author calls Adaptive Programming - doing what works in your situation, and it is concise, covering the whole software development lifecycle in one slim volume. At each stage, it describes common pitfalls, explains how these can be avoided, and suggests simple techniques which make it easier to deliver better solutions. "Well thought-out addresses many of the key issues facing developers of bioinformatics software." (Simon Dear, Director, UK Technology and Development, Bioinformatics Engineering and Integration, Genetics Research, GlaxoSmithKline) Here are some examples from the book itself. On software development: "Writing software properly involves talking to people – often lots of people – and plenty of non-coding work on your part. It requires the ability to dream up new solutions to problems so complicated that they are hard to describe." From description to specification: "Look for verbs – action words, such as 'does', 'is' and 'views'. Identify nouns – naming words, like 'user', 'home' and 'sequence'. List the adjectives – describing words, for example 'quick', 'simple' or 'precise'. The verbs are the functions that must be provided by your application. The nouns define the parameters to those functions, and the adjectives specify the constraint conditions under which your program must operate." On how to start writing software: "Handle errors. Take in data. Show output. Get going!" On testing: "It may not be physically possible to test every potential combination of situations that could occur as users interact with a program. But one thing that can be done is to test an application at the agreed extremes of its capability: the maximum number of simultaneous users it has to support, the minimum system configuration it must run on, the lowest communication speed it must cope with, and the most complex operations it must perform. If your program can cope with conditions at the edge of its performance envelope, it is less likely to encounter difficulties in dealing with less challenging

situations." On showing early versions of software to users: "It can be hard explaining the software development process to people who are unfamiliar with it. Code that to you is nearly finished is simply not working to them, and seeing their dream in bits on the workbench can be disappointing to customers, especially when they were expecting to be able to take it for a test drive." On bugs: "If your users find a genuinely reproducible bug in production code, apologize, fix it fast, and then fix the system that allowed it through. And tell your customers what you are doing, and why, so they will be confident that it will not happen again. Everybody makes mistakes. Don't make the same ones twice." And one last thought on successful software development: "You have to be a detective, following up clues and examining evidence to discover what has gone wrong and why. And you have to be a politician, understanding what people want, both in public and in private, and how this is likely to affect what you are trying to do. This book cannot teach you how to do all of that, but it can help."

Agile Processes in Software Engineering and Extreme Programming

This is the digital version of the printed book (Copyright © 1996). Written in a remarkably clear style, Creating a Software Engineering Culture presents a comprehensive approach to improving the quality and effectiveness of the software development process. In twenty chapters spread over six parts, Wiegers promotes the tactical changes required to support process improvement and high-quality software development. Throughout the text, Wiegers identifies scores of culture builders and culture killers, and he offers a wealth of references to resources for the software engineer, including seminars, conferences, publications, videos, and on-line information. With case studies on process improvement and software metrics programs and an entire part on action planning (called "What to Do on Monday"), this practical book guides the reader in applying the concepts to real life. Topics include software culture concepts, team behaviors, the five dimensions of a software project, recognizing achievements, optimizing customer involvement, the project champion model, tools for sharing the vision, requirements traceability matrices, the capability maturity model, action planning, testing, inspections, metrics-based project estimation, the cost of quality, and much more! Principles from Part 1 Never let your boss or your customer talk you into doing a bad job. People need to feel the work they do is appreciated. Ongoing education is every team member's responsibility. Customer involvement is the most critical factor in software quality. Your greatest challenge is sharing the vision of the final product with the customer. Continual improvement of your software development process is both possible and essential. Written software development procedures can help build a shared culture of best practices. Quality is the top priority; long-term productivity is a natural consequence of high quality. Strive to have a peer, rather than a customer, find a defect. A key to software quality is to iterate many times on all development steps except coding: Do this once. Managing bug reports and change requests is essential to controlling quality and maintenance. If you measure what you do, you can learn to do it better. You can't change everything at once. Identify those changes that will yield the greatest benefits, and begin to implement them next Monday. Do what makes sense; don't resort to dogma.

Foundations of Software Engineering

This book constitutes the refereed proceedings of the 4th International Conference on Extreme Programming and Agile Processes in Software Engineering, XP 2003, held in Genova, Italy in May 2003. The 33 revised full papers presented together with experience reports, research reports, abstracts from an educational symposium and a PhD symposium, as well as panel statements were carefully reviewed and selected for inclusion in the book. The papers are organized in topical sections on managing agile processes, methodological issues, extending agile methodologies and XP, methods and tools, teaching and education aspects, testing, pair programming, and other XP practices.

Facts and Fallacies of Software Engineering

Overview and Goals The agile approach for software development has been applied more and more extensively since the mid nineties of the 20th century. Though there are only about ten years of accumulated experience using the agile approach, it is currently conceived as one of the mainstream approaches for software development. This book presents a complete software engineering course from the agile angle. Our intention is to present the agile approach in a holistic and compreh- sive learning environment that fits both industry and academia and inspires the spirit of agile software development. Agile software engineering is reviewed in this book through the following three perspectives: l The Human perspective, which includes cognitive and social aspects, and refers to learning and interpersonal processes between teammates, customers, and management. l The Organizational perspective, which includes managerial and cultural aspects, and refers to software project management and control. l The Technological perspective, which includes practical and technical aspects, and refers to design, testing, and coding, as well as to integration, delivery, and maintenance of software products. Specifically, we explain and analyze how the explicit attention that agile software development gives these perspectives and their interconnections, helps viii Preface it cope with the challenges of software projects. This multifaceted perspective on software development processes is reflected in this book, among other ways, by the chapter titles, which specify dimensions of software development projects such as quality, time, abstraction, and management, rather than specific project stages, phases, or practices.

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