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Advances in Software Engineering Springer Science & Business Media

-- Includes Year 2000 strategies and implementations from Fortune 100 professionals. -- Features analysis of software methods, techniques and in-depth case studies. -- Contains Year 2000 checklists and code samples.

Computer Aided Software Engineering CRC Press

This is the first handbook to cover comprehensively both software engineering and knowledge engineering OCo two important fields that have become interwoven in recent years. Over 60 international experts have contributed to the book. Each chapter has been written in such a way that a practitioner of software engineering and knowledge engineering can easily understand and obtain useful information. Each chapter covers one topic and can be read independently of other chapters, providing both a general survey of the topic and an in-depth exposition of the state of the art. Practitioners will find this handbook useful when looking for solutions to practical problems. Researchers can use it for quick access to the background, current trends and most important references regarding a certain topic. The handbook consists of two volumes.

Volume One covers the basic principles and applications of software engineering and knowledge engineering. Volume Two will cover the basic principles and applications of visual and multimedia software engineering, knowledge engineering, data mining for software knowledge, and emerging topics in software engineering and knowledge engineering. Sample Chapter(s). Chapter 1.1: Introduction (97k). Chapter 1.2: Theoretical Language Research (97k). Chapter 1.3: Experimental Science (96k). Chapter 1.4: Evolutionary Versus Revolutionary (108k). Chapter 1.5: Concurrency and Parallelisms (232k). Chapter 1.6: Summary (123k). Contents: Computer Language Advances (D E Cooke et al.); Software Maintenance (G Canfora & A Cimitile); Requirements Engineering (A T Berztiss); Software Engineering Standards: Review and Perspectives (Y-X Wang); A Large Scale Neural Network and Its Applications (D Graupe & H Kordylewski); Software Configuration Management in Software and Hypermedia Engineering: A Survey (L Bendix et al.); The Knowledge Modeling Paradigm in Knowledge Engineering (E Motta); Software Engineering and Knowledge Engineering Issues in Bioinformatics (J T L Wang et al.); Conceptual Modeling in Software Engineering and Knowledge Engineering: Concepts, Techniques and Trends (O Dieste et al.); Rationale Management in Software Engineering (A H Dutoit & B Paech); Exploring Ontologies (Y Kalfoglou), and other papers. Readership: Graduate students, researchers, programmers, managers and academics in software engineering and knowledge engineering."

Aligning Enterprise, System, and Software Architectures John Wiley & Sons

This book constitutes the refereed proceedings of two joint events: the 25th International Workshop on Software Measurement (IWSM) and the 10th International Conference on Software Process and Product Measurement (Mensura), referred to as IWSM?Mensura 2015 and held in Kraków, Poland, in October 2015. Software measurement is a key methodology in estimating, managing, and controlling software development and management projects. The 13 papers presented in this volume were carefully reviewed and selected from 32 submissions. They present various theoretical and empirical results related to software measurement and its application in industrial projects.

Software Engineering - ESEC '95 CRC Press

As future generation information technology (FGIT) becomes specialized and fr- mented, it is easy to lose sight that many topics in FGIT have common threads and, because of this, advances in one discipline may be transmitted to others. Presentation of recent results obtained in different disciplines encourages this interchange for the advancement of FGIT as a whole. Of particular interest are hybrid solutions that c- bine ideas taken from multiple disciplines in order to achieve something more signi- cant than the sum of the individual parts. Through such hybrid philosophy, a new principle can be discovered, which has the propensity to propagate throughout mul- faceted disciplines. FGIT 2009 was the first mega-conference that attempted to follow the above idea of hybridization in FGIT in a form of multiple events related to particular disciplines of IT, conducted by separate scientific committees, but coordinated in order to expose the most important contributions. It included the following international conferences: Advanced Software Engineering and Its Applications (ASEA), Bio-Science and Bio- Technology (BSBT), Control and Automation (CA), Database Theory and Appli- tion (DTA), Disaster Recovery and Business Continuity (DRBC; published indepe- ently), Future Generation Communication and Networking (FGCN) that was c- bined with Advanced Communication and Networking (ACN), Grid and Distributed Computing

(GDC), Multimedia, Computer Graphics and Broadcasting (MulGraB), Security Technology (SecTech), Signal Processing, Image Processing and Pattern Recognition (SIP), and u- and e-Service, Science and Technology (UNESST).

Wicked Problems, Righteous Solutions Springer

Software engineering, is widely recognized as one of today's most exciting, stimulating, and profitable research areas, with a significant practical impact on the software industry and academia. The LASER school, held annually since 2004 on Elba Island, Italy, is intended for professionals from industry (engineers and managers) as well as university researchers, including PhD students. This book contains selected lecture notes from the LASER summer schools 2008-2010, which focused on concurrency and correctness in 2008, software testing in 2009, and empirical software engineering, in 2010.

Computational Intelligence Techniques and Their Applications to Software Engineering Problems Industrial Info Systems

The idea for this workshop originated when I came across and read Martin Zelkowitz's book on Requirements for Software Engineering Environments (the proceedings of a small workshop held at the University of Maryland in 1986). Although stimulated by the book I was also disappointed in that it didn't adequately address two important questions - "Whose requirements are these?" and "Will the environment which meets all these requirements be usable by software engineers?". And thus was the decision made to organise this workshop which would explicitly address these two questions. As time went by setting things up, it became clear that our workshop would happen more than five years after the Maryland workshop and thus, at the same time as addressing the two questions above, this workshop would attempt to update the Zelkowitz approach. Hence the workshop acquired two halves, one dominated by discussion of what we already know about usability problems in software engineering and the other by discussion of existing solutions (technical and otherwise) to these problems. This scheme also provided a good format for bringing together those in the HeI community concerned with the human factors of software engineering and those building tools to solve acknowledged, but rarely understood problems.

Springer Nature

This book summarizes the current hard problems in software testing as voiced by leading practitioners in the field. The problems were identified through a series of workshops, interviews, and surveys. Some of the problems are timeless, such as education and training, while others such as system security have recently emerged as increasingly important. The book also provides an overview of the current state of Testing as a Service (TaaS) based on an exploration of existing commercial offerings and a survey of academic research. TaaS is a relatively new development that offers software testers the elastic computing capabilities and generous storage capacity of the cloud on an as-needed basis. Some of the potential benefits of TaaS include automated provisioning of test execution environments and support for rapid feedback in agile development via continuous regression testing. The book includes a case study of a representative web application and three commercial TaaS tools to determine which hard problems in software testing are amenable to a TaaS solution. The findings suggest there remains a significant gap that must be addressed before TaaS can be fully embraced by the industry, particularly in the areas of tester education and

training and a need for tools supporting more types of testing. The book includes a roadmap for enhancing TaaS to help bridge the gap between potential benefits and actual results. Table of Contents: Introduction / Hard Problems in Software Testing / Testing as a Service (TaaS) / Case Study and Gap Analysis / Summary / Appendix A: Hard Problems in Software Testing Survey / Appendix B: Google App Engine Code Examples / Appendix C: Sauce Labs Code Examples / References / Author Biographies

Software Engineering: Challenges and Solutions CRC Press

This book presents the proceedings of the KKIO Software Engineering Conference held in Wroc ł aw, Poland in September 15-17, 2016. It contains the carefully reviewed and selected scientific outcome of the conference, which had the motto: " Better software = more efficient enterprise: challenges and solutions " . Following this mission, this book is a compilation of challenges and needs of the industry, as well as research findings and achievements that could address the posed problems in software engineering. Some of these challenges included in the book are: increasing levels of abstraction for programming constructs, increasing levels of software reuse, increasing levels of automation, optimizing software development cycles. The book provides a platform for communication between researchers, young and established, and practitioners.

Handbook of Software Engineering and Knowledge Engineering Springer Science & Business Media

Logic and object-orientation have come to be recognized as being among the most powerful paradigms for modeling information systems. The term "information systems" is used here in a very general context to denote database systems, software development systems, knowledge base systems, proof support systems, distributed systems and reactive systems. One of the most vigorously researched topics common to all information systems is "formal modeling". An elegant high-level abstraction applicable to both application domain and system domain concepts will always lead to a system design from "outside in"; that is, the aggregation of ideas is around real-life objects about which the system is to be designed. Formal methods \yhen applied with this view in mind, especially during early stages of system development, can lead to a formal reasoning on the intended properties, thus revealing system flaws that might otherwise be discovered much later. Logic in different styles and semantics is being used to model databases and their transactions; it is also used to specify concurrent, distributed, real-time, and reactive systems. ,The notion of "object" is central to the modeling of object oriented databases, as well as object-oriented design and programs in software engineering. Both database and software engineering communities have undoubtedly made important contributions to formalisms based on logic and

objects. It is worthwhile bringing together the ideas developed by the two communities in isolation, and focusing on integrating their common strengths.

Software Design Springer Science & Business Media

This book constitutes the refereed proceedings of the 13th International Conference on Fundamental Approaches to Software Engineering, FASE 2010, held in Paphos, Cyprus, in March 2010, as part of ETAPS 2010, the European Joint Conferences on Theory and Practice of Software. The 25 papers presented were carefully reviewed and selected from 103 submissions. The volume also contains one invited talk. The topics covered are model transformation, software evolution, graph transformation, modeling concepts, verification, program analysis, testing and debugging, and performance modeling and analysis.

Handbook of Software Engineering and Knowledge Engineering Springer

This book discusses various open issues in software engineering, such as the efficiency of automated testing techniques, predictions for cost estimation, data processing, and automatic code generation. Many traditional techniques are available for addressing these problems. But, with the rapid changes in software development, they often prove to be outdated or incapable of handling the software ' s complexity. Hence, many previously used methods are proving insufficient to solve the problems now arising in software development. The book highlights a number of unique problems and effective solutions that reflect the state-of-the-art in software engineering. Deep learning is the latest computing technique, and is now gaining popularity in various fields of software engineering. This book explores new trends and experiments that have yielded promising solutions to current challenges in software engineering. As such, it offers a valuable reference guide for a broad audience including systems analysts, software engineers, researchers, graduate students and professors engaged in teaching software engineering.

Simple Statistical Methods for Software Engineering CRC Press

This book describes a complete revolution in software engineering based on complexity science through the establishment of NSE – Nonlinear Software Engineering paradigm which complies with the essential principles of complexity science, including the Nonlinearity principle, the Holism principle, the Complexity Arises From Simple Rules principle, the Initial Condition Sensitivity principle, the Sensitivity to Change principle, the Dynamics principle, the Openness principle, the Self-organization principle, and the Self-adaptation principle. The aims of this book are to offer revolutionary solutions to solve the critical problems existing with the old-established software engineering paradigm based on linear thinking and simplistic science complied with the superposition principle, and make it possible tohelp software development organizations double their productivity, halve their cost, and remove 99% to 99.99% of the defects in their software products, and efficiently handle software complexity, conformity, visibility, and changeability. It covers almost all areas in software engineering. The tools NSE_CLICK- an automatic acceptance testing platform for outsourcing (or internally developed) C/C++ products, and NSE_CLICK_J - an

automatic acceptance testing platform for outsourcing (or internally developed) Java products are particularly designed for non-technical readers to view/review how the acceptance testing of a software product developed with NSE can be performed automatically, and how the product developed with NSE is truly maintainable at the customer site.

Software Engineering Design World Scientific

This textbook presents a concise introduction to the fundamental principles of software engineering, together with practical guidance on how to apply the theory in a real-world, industrial environment. The wide-ranging coverage encompasses all areas of software design, management, and quality. Topics and features: presents a broad overview of software engineering, including software lifecycles and phases in software development, and project management for software engineering; examines the areas of requirements engineering, software configuration management, software inspections, software testing, software quality assurance, and process quality; covers topics on software metrics and problem solving, software reliability and dependability, and software design and development, including Agile approaches; explains formal methods, a set of mathematical techniques to specify and derive a program from its specification, introducing the Z specification language; discusses software process improvement, describing the CMMI model, and introduces UML, a visual modelling language for software systems; reviews a range of tools to support various activities in software engineering, and offers advice on the selection and management of a software supplier; describes such innovations in the field of software as distributed systems, service-oriented architecture, software as a service, cloud computing, and embedded systems; includes key learning topics, summaries and review questions in each chapter, together with a useful glossary. This practical and easy-to-follow textbook/reference is ideal for computer science students seeking to learn how to build high quality and reliable software on time and on budget. The text also serves as a self-study primer for software engineers, quality professionals, and software managers.

IEEE Computer Society Real-World Software Engineering Problems CRC Press

The Knowledge Sharing Mechanism (KSM) is a framework to develop solutions to the complex problems faced in both software engineering and command and control. The environments of software engineering and military command and control systems are very similar because they are both instances of complex problem solving. The common nemesis to successfully developing solutions in these environments is change. Our understanding of the problem and the requirements needed to solve the problem as well as the problem environment itself undergo change. The challenge for any complex problem solving methodology is the balance of adapting to multiple changes while keeping focused on the overall desired solution. The KSM is an iterative method for understanding a complex problem,

developing a framework for solving that problem, creating, developing, and refining the parts of the solution for the problem, and then reassessing those partial solutions and overall framework until the complete solution has been fully developed. The KSM is based on the integration of Christopher Alexander's unfolding and differentiation processes with the image theory of command and control. In image theory, there are two perspectives in developing a solution. The first is topsight which is an overall general picture of the situation, and the second is insight which is a focused detailed view of a portion of the solution. Use of topsight and insight must be balanced in order to enable the solution's success. Alexander's unfolding process is the basis for understanding the complex interactions of both the software engineering and command and control environments. The KSM uses Alexander's differentiation process to achieve the correct balance of topsight and insight. The KSM also uses the Knowledge Management discipline as another perspective in learning how to solve complex problems. The KSM uses the Knowledge Insight Model (KIM) in which there are four roles or patterns in Knowledge Management: the Framer.

Beyond Programming-in-the-Large: The Next Challenges for Software Engineering Coriolis Group As society's dependence on computing broadens, software engineering is being called upon to address new problems that raise new technical and non-technical concerns. Aspirations and expectations for the applications of computers appear to be unbounded, but present software development and support techniques will not be adequate to build computational systems that satisfy our expectations, even at very high cost. Each order-of-magnitude increase in the scale of the problems being solved leads to a new set of critical problems that require essentially new solutions. The next challenges for software engineering will deal with software as one of many elements in complex systems, which we call program-as-component, and with the role of software as an active participant in the software development process, which we call program-as-deputy.

Search Based Software Engineering Prentice Hall During the last few years, software evolution research has explored new domains such as the study of socio-technical aspects and collaboration between different individuals contributing to a software system, the use of search-based techniques and meta-heuristics, the mining of unstructured software repositories, the evolution of software requirements, and the dynamic adaptation of software systems at runtime. Also more and more attention is being paid to the evolution of collections of inter-related and inter-dependent software projects, be it in the form of web systems, software product families, software

ecosystems or systems of systems. With this book, the editors present insightful contributions on these and other domains currently being intensively explored, written by renowned researchers in the respective fields of software evolution. Each chapter presents the state of the art in a particular topic, as well as the current research, available tool support and remaining challenges. The book is complemented by a glossary of important terms used in the community, a reference list of nearly 1,000 papers and books and tips on additional resources that may be useful to the reader (reference books, journals, standards and major scientific events in the domain of software evolution and datasets). This book is intended for all those interested in software engineering, and more particularly, software maintenance and evolution. Researchers and software practitioners alike will find in the contributed chapters an overview of the most recent findings, covering a broad spectrum of software evolution topics. In addition, it can also serve as the basis of graduate or postgraduate courses on e.g., software evolution, requirements engineering, model-driven software development or social informatics.

Formal Methods in Databases and Software Engineering World Scientific

Computer Aided Software Engineering brings together in one place important contributions and up-to-date research results in this important area. Computer Aided Software Engineering serves as an excellent reference, providing insight into some of the most important research issues in the field.

Empirical Software Engineering and Verification Springer Science & Business Media

This book presents contemporary empirical methods in software engineering related to the plurality of research methodologies, human factors, data collection and processing, aggregation and synthesis of evidence, and impact of software engineering research. The individual chapters discuss methods that impact the current evolution of empirical software engineering and form the backbone of future research. Following an introductory chapter that outlines the background of and developments in empirical software engineering over the last 50 years and provides an overview of the subsequent contributions, the remainder of the book is divided into four parts: Study Strategies (including e.g. guidelines for surveys or design science); Data Collection, Production, and Analysis (highlighting approaches from e.g. data science, biometric measurement, and simulation-based studies); Knowledge Acquisition and Aggregation (highlighting literature research, threats to validity, and evidence aggregation); and Knowledge Transfer (discussing open science and knowledge transfer with industry). Empirical methods like experimentation have become a powerful means of advancing the field of software engineering by providing scientific evidence on software development, operation, and maintenance, but also by supporting practitioners in their decision-making and learning processes. Thus the book is equally suitable for academics aiming to expand the field and for industrial researchers and practitioners looking for novel ways to check the validity of

their assumptions and experiences. Chapter 17 is available open access under a Creative Commons Attribution 4.0 International License via link.springer.com.

The Problem with Software Springer

This book constitutes the refereed proceedings of the 8th International Symposium on Search-Based Software Engineering, SSBSE 2016, held in Raleigh, NC, USA, in October 2016.The 13 revised full papers and 4 short papers presented together with 7 challenge track and 4 graduate student track papers were carefully reviewed and selected from 48 submissions. Search Based Software Engineering (SBSE) studies the application of meta-heuristic optimization techniques to various software engineering problems, ranging from requirements engineering to software testing and maintenance.

Fundamental Approaches to Software Engineering Springer

Software Design: Creating Solutions for Ill-Structured Problems, Third Edition provides a balanced view of the many and varied software design practices used by practitioners. The book provides a general overview of software design within the context of software development and as a means of addressing ill-structured problems. The third edition has been expanded and reorganised to focus on the structure and process aspects of software design, including architectural issues, as well as design notations and models. It also describes a variety of different ways of creating design solutions such as plan-driven development, agile approaches, patterns, product lines, and other forms. Features • Includes an overview and review of representation forms used for modelling design solutions • Provides a concise review of design practices and how these relate to ideas about software architecture • Uses an evidence-informed basis for discussing design concepts and when their use is appropriate This book is suitable for undergraduate and graduate students taking courses on software engineering and software design, as well as for software engineers. Author David Budgen is a professor emeritus of software engineering at Durham University. His research interests include evidence-based software engineering (EBSE), software design, and healthcare informatics.