

Software Engineering Concepts By Richard Fairley

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Elements of Systems Analysis - Marvin Gore
1988-03

Software Engineering - A. Frank Ackerman
1997
"Software Engineering" describes the current

state-of-the-art practice of software engineering, beginning with an overview of current issues and focusing on the engineering of large complex systems. The text illustrates the phases of the software development life cycle: requirements, design, implementation, testing and maintenance.

Design of Multithreaded Software - Bo I. Sanden 2011-04-06

This book assumes familiarity with threads (in a language such as Ada, C#, or Java) and introduces the entity-life modeling (ELM) design approach for certain kinds of multithreaded software. ELM focuses on "reactive systems," which continuously interact with the problem environment. These "reactive systems" include embedded systems, as well as such interactive systems as cruise controllers and automated teller machines. Part I covers two fundamentals: program-language thread support and state diagramming. These are necessary for understanding ELM and are provided primarily

for reference. Part II covers ELM from different angles. Part III positions ELM relative to other design approaches.

Agile Model-Based Systems Engineering Cookbook - Bruce Powel Douglass 2021-03-31
The Agile Model-Based Systems Engineering Cookbook distills the most relevant MBSE workflows and work products into a set of easy-to-follow recipes, complete with examples of their application. This book serves as a quick and reliable practical reference for systems engineers looking to apply agile MBSE to real-world projects.

Software Methods for Business Reengineering - Alfs Berztiss 2012-12-06
An approach to reorganising businesses using software engineering as a guiding paradigm. The author argues that software engineering provides both the necessary analytical expertise as well as the tools to transform process descriptions to support systems. He begins by introducing the necessary concepts, principles

and practice before demonstrating how a business can define and construct the information base required. As a result, any manager or technically-minded person will learn here how to implement the reengineering of a business.

A Practical Handbook for Software Development
- N. D. Birrell 1988-02-11

A guide to the development process covers phase planning, indicators, models, configuration, project inception, system definition, design, and production, and project debriefing

Object Oriented Systems Development - Ali Bahrami 1999-02-01

Issues in Software Engineering Education -
Richard Fairley 2012-12-06

This volume combines the proceedings of the 1987 SEI Conference on Software Engineering Education, held in Monroeville, Pennsylvania on April 30 and May 1, 1987, with the set of papers

that formed the basis for that conference. The conference was sponsored by the Software Engineering Institute (SEI) of Carnegie-Mellon University. SEI is a federally-funded research and development center established by the United States Department of Defense to improve the state of software technology. The Education Division of SEI is charged with improving the state of software engineering education. This is the third volume on software engineering education to be published by Springer-Verlag. The first (Software Engineering Education: Needs and Objectives, edited by Tony Wasserman and Peter Freeman) was published in 1976. That volume documented a workshop in which educators and industrialists explored needs and objectives in software engineering education. The second volume (Software Engineering Education: The Educational Needs of the Software Community, edited by Norm Gibbs and Richard Fairley) was published in 1986. The 1986 volume contained the

proceedings of a limited attendance workshop held at SEI and sponsored by SEI and Wang Institute. In contrast to the 1986 Workshop, which was limited in attendance to 35 participants, the 1987 Conference attracted approximately 180 participants.

Cyber Security Engineering - Nancy R. Mead
2016-11-07

Cyber Security Engineering is the definitive modern reference and tutorial on the full range of capabilities associated with modern cyber security engineering. Pioneering software assurance experts Dr. Nancy R. Mead and Dr. Carol C. Woody bring together comprehensive best practices for building software systems that exhibit superior operational security, and for considering security throughout your full system development and acquisition lifecycles. Drawing on their pioneering work at the Software Engineering Institute (SEI) and Carnegie Mellon University, Mead and Woody introduce seven core principles of software assurance, and show

how to apply them coherently and systematically. Using these principles, they help you prioritize the wide range of possible security actions available to you, and justify the required investments. Cyber Security Engineering guides you through risk analysis, planning to manage secure software development, building organizational models, identifying required and missing competencies, and defining and structuring metrics. Mead and Woody address important topics, including the use of standards, engineering security requirements for acquiring COTS software, applying DevOps, analyzing malware to anticipate future vulnerabilities, and planning ongoing improvements. This book will be valuable to wide audiences of practitioners and managers with responsibility for systems, software, or quality engineering, reliability, security, acquisition, or operations. Whatever your role, it can help you reduce operational problems, eliminate excessive patching, and deliver software that is more resilient and

secure.

Managing and Leading Software Projects -

Richard E. Fairley 2011-09-20

The book is organized around basic principles of software project management: planning and estimating, measuring and controlling, leading and communicating, and managing risk.

Introduces software development methods, from traditional (hacking, requirements to code, and waterfall) to iterative (incremental build, evolutionary, agile, and spiral). Illustrates and emphasizes tailoring the development process to each project, with a foundation in the fundamentals that are true for all development methods. Topics such as the WBS, estimation, schedule networks, organizing the project team, and performance reporting are integrated, rather than being relegated to appendices. Each chapter in the book includes an appendix that covers the relevant topics from CMMI-DEV-v1.2, IEEE/ISO Standards 12207, IEEE Standard 1058, and the PMI® Body of Knowledge. (PMI is

a registered mark of Project Management Institute, Inc.)

Guide to the Software Engineering Body of Knowledge - Alain Abran 2004

The purpose of the Guide to the Software Engineering Body of Knowledge is to provide a validated classification of the bounds of the software engineering discipline and topical access that will support this discipline. The Body of Knowledge is subdivided into ten software engineering Knowledge Areas (KA) that differentiate among the various important concepts, allowing readers to find their way quickly to subjects of interest. Upon finding a subject, readers are referred to key papers or book chapters. Emphases on engineering practice lead the Guide toward a strong relationship with the normative literature. The normative literature is validated by consensus formed among practitioners and is concentrated in standards and related documents. The two major standards bodies for software engineering

(IEEE Computer Society Software and Systems Engineering Standards Committee and ISO/IEC JTC1/SC7) are represented in the project.

Continuous Software Engineering - Jan Bosch
2014-11-11

This book provides essential insights on the adoption of modern software engineering practices at large companies producing software-intensive systems, where hundreds or even thousands of engineers collaborate to deliver on new systems and new versions of already deployed ones. It is based on the findings collected and lessons learned at the Software Center (SC), a unique collaboration between research and industry, with Chalmers University of Technology, Gothenburg University and Malmö University as academic partners and Ericsson, AB Volvo, Volvo Car Corporation, Saab Electronic Defense Systems, Grundfos, Axis Communications, Jeppesen (Boeing) and Sony Mobile as industrial partners. The 17 chapters present the “Stairway to Heaven” model, which

represents the typical evolution path companies move through as they develop and mature their software engineering capabilities. The chapters describe theoretical frameworks, conceptual models and, most importantly, the industrial experiences gained by the partner companies in applying novel software engineering techniques. The book’s structure consists of six parts. Part I describes the model in detail and presents an overview of lessons learned in the collaboration between industry and academia. Part II deals with the first step of the Stairway to Heaven, in which R&D adopts agile work practices. Part III of the book combines the next two phases, i.e., continuous integration (CI) and continuous delivery (CD), as they are closely intertwined. Part IV is concerned with the highest level, referred to as “R&D as an innovation system,” while Part V addresses a topic that is separate from the Stairway to Heaven and yet critically important in large organizations: organizational performance metrics that capture data, and

visualizations of the status of software assets, defects and teams. Lastly, Part VI presents the perspectives of two of the SC partner companies. The book is intended for practitioners and professionals in the software-intensive systems industry, providing concrete models, frameworks and case studies that show the specific challenges that the partner companies encountered, their approaches to overcoming them, and the results. Researchers will gain valuable insights on the problems faced by large software companies, and on how to effectively tackle them in the context of successful cooperation projects.

Classics in Software Engineering - Edward Yourdon 1979

Issues in Software Engineering Education - Richard Fairley 1989

This volume combines the proceedings of the 1987 SEI Conference on Software Engineering Education, held in Monroeville, Pennsylvania on

April 30 and May 1, 1987, with the set of papers that formed the basis for that conference. The conference was sponsored by the Software Engineering Institute (SEI) of Carnegie-Mellon University. SEI is a federally-funded research and development center established by the United States Department of Defense to improve the state of software technology. The Education Division of SEI is charged with improving the state of software engineering education. This is the third volume on software engineering education to be published by Springer-Verlag. The first (Software Engineering Education: Needs and Objectives, edited by Tony Wasserman and Peter Freeman) was published in 1976. That volume documented a workshop in which educators and industrialists explored needs and objectives in software engineering education. The second volume (Software Engineering Education: The Educational Needs of the Software Community, edited by Norm Gibbs and Richard Fairley) was published in

1986. The 1986 volume contained the proceedings of a limited attendance workshop held at SEI and sponsored by SEI and Wang Institute. In contrast to the 1986 Workshop, which was limited in attendance to 35 participants, the 1987 Conference attracted approximately 180 participants.

Software Engineering Concepts - Richard E. Fairley 1985

Cost Estimating and Analysis - Thomas R. Gullledge 2012-12-06

Cost analysis and estimating is a vital part of the running of all organizations, both commercial and government. This volume comprises the proceedings of the 1992 conference of the Society for Cost Estimating and Analysis. Individual chapters are written by experts in their respective fields. Consequently, the volume as a whole provides an invaluable and up-to-date survey of the field.

Collaborative Software Engineering - Ivan

Mistriř 2010-03-10

Collaboration among individuals - from users to developers - is central to modern software engineering. It takes many forms: joint activity to solve common problems, negotiation to resolve conflicts, creation of shared definitions, and both social and technical perspectives impacting all software development activity. The difficulties of collaboration are also well documented. The grand challenge is not only to ensure that developers in a team deliver effectively as individuals, but that the whole team delivers more than just the sum of its parts. The editors of this book have assembled an impressive selection of authors, who have contributed to an authoritative body of work tackling a wide range of issues in the field of collaborative software engineering. The resulting volume is divided into four parts, preceded by a general editorial chapter providing a more detailed review of the domain of collaborative software engineering. Part 1 is

on "Characterizing Collaborative Software Engineering", Part 2 examines various "Tools and Techniques", Part 3 addresses organizational issues, and finally Part 4 contains four examples of "Emerging Issues in Collaborative Software Engineering". As a result, this book delivers a comprehensive state-of-the-art overview and empirical results for researchers in academia and industry in areas like software process management, empirical software engineering, and global software development. Practitioners working in this area will also appreciate the detailed descriptions and reports which can often be used as guidelines to improve their daily work.

MITRE Systems Engineering Guide - 2012-06-05

Software Engineering Fundamentals - Ali Behforooz 1996

While encouraging the use of modeling techniques for sizing, cost and schedule estimation, reliability, risk assessment, and real-

time design, the authors emphasize the need to calibrate models with actual data. Explicit guidance is provided for virtually every task that a software engineer may be assigned, and realistic case studies and examples are used extensively to reinforce the topics presented.

Guide to the Software Engineering Body of Knowledge (Swebok(r)) - IEEE Computer Society 2014

In the Guide to the Software Engineering Body of Knowledge (SWEBOK(R) Guide), the IEEE Computer Society establishes a baseline for the body of knowledge for the field of software engineering, and the work supports the Society's responsibility to promote the advancement of both theory and practice in this field. It should be noted that the Guide does not purport to define the body of knowledge but rather to serve as a compendium and guide to the knowledge that has been developing and evolving over the past four decades. Now in Version 3.0, the Guide's 15 knowledge areas summarize

generally accepted topics and list references for detailed information. The editors for Version 3.0 of the SWEBOK(R) Guide are Pierre Bourque (Ecole de technologie superieure (ETS), Universite du Quebec) and Richard E. (Dick) Fairley (Software and Systems Engineering Associates (S2EA)).

Software Architecture: A Case Based Approach - Varma, Vasudeva

Software Architecture: A Case Based Approach discusses the discipline using real-world case studies and posing pertinent questions that arouse objective thinking. It encourages the reader to think about the subject in the context of problems that s

Software Engineering Measurement - Ph.D., John C. Munson 2003-03-12

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

Cyber-Physical Systems of Systems - Andrea Bondavalli 2016-12-16

This book is open access under a CC BY 4.0 license. Technical Systems-of-Systems (SoS) - in the form of networked, independent constituent computing systems temporarily collaborating to achieve a well-defined objective - form the backbone of most of today's infrastructure. The energy grid, most transportation systems, the global banking industry, the water-supply system, the military equipment, many embedded systems, and a great number more, strongly depend on systems-of-systems. The correct operation and continuous availability of these underlying systems-of-systems are fundamental for the functioning of our modern society. The 8 papers presented in this book document the main insights on Cyber-Physical System of

Systems (CPSoSs) that were gained during the work in the FP7-610535 European Research Project AMADEOS (acronym for Architecture for Multi-criticality Agile Dependable Evolutionary Open System-of-Systems). It is the objective of this book to present, in a single consistent body, the foundational concepts and their relationships. These form a conceptual basis for the description and understanding of SoSs and go deeper in what we consider the characterizing and distinguishing elements of SoSs: time, emergence, evolution and dynamicity.

Software Engineering - Vaclav Rajlich

2016-04-19

Software Engineering: The Current Practice teaches students basic software engineering skills and helps practitioners refresh their knowledge and explore recent developments in the field, including software changes and iterative processes of software development. After a historical overview and an introduction

to software technology and models, the book discusses the software change and its phases, including concept location, impact analysis, refactoring, actualization, and verification. It then covers the most common iterative processes: agile, directed, and centralized processes. The text also journeys through the software life span from the initial development of software from scratch to the final stages that lead toward software closedown. For Professionals The book gives programmers and software managers a unified view of the contemporary practice of software engineering. It shows how various developments fit together and fit into the contemporary software engineering mosaic. The knowledge gained from the book allows practitioners to evaluate and improve the software engineering processes in their projects. For Instructors Instructors have several options for using this classroom-tested material. Designed to be run in conjunction with the lectures, ideas for student projects include

open source programs that use Java or C++ and range in size from 50 to 500 thousand lines of code. These projects emphasize the role of developers in a classroom-tailored version of the directed iterative process (DIP). For Students Students gain a real understanding of software engineering processes through the lectures and projects. They acquire hands-on experience with software of the size and quality comparable to that of industrial software. As is the case in the industry, students work in teams but have individual assignments and accountability.

Introduction to Software Engineering (Custom Edition) - Sommerville 2012-06-25

This custom edition is published for the University of Southern Queensland.

Object Thinking - David West 2004

Object Thinking blends historical perspective, experience, and visionary insight - exploring how developers can work less like the computers they program and more like problem solvers.

The Incremental Commitment Spiral Model

- Barry W. Boehm 2014

Many systems development practitioners find traditional "one-size-fits-all" processes inadequate for the growing complexity, diversity, dynamism, and assurance needs of their products and services. The Incremental Commitment Spiral Model (ICSM) responds with a principle- and risk-based framework for defining and evolving your project and corporate process assets. This book explains ICSM's framework of decision criteria and principles, and shows how to apply them through relevant examples.

Systems Engineering of Software-Enabled Systems - Richard E. Fairley 2019-07-30

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.

Android Programming Unleashed - B.M. Harwani 2012-12-14

Android Programming Unleashed is the most comprehensive and technically sophisticated guide to best-practice Android development with

today's powerful new versions of Android: 4.1 (Jelly Bean) and 4.0.3 (Ice Cream Sandwich). Offering the exceptional breadth and depth developers have come to expect from the Unleashed series, it covers everything programmers need to know to develop robust, high-performance Android apps that deliver a superior user experience. Leading developer trainer Bintu Harwani begins with basic UI controls, then progresses to more advanced topics, finally covering how to develop feature rich Android applications that can access Internet-based services and store data. He illuminates each important SDK component through complete, self-contained code examples that show developers the most effective ways to build production-ready code. Coverage includes: understanding the modern Android platform from the developer's standpoint... using widgets, containers, resources, selection widgets, dialogs, and fragments... supporting actions and persistence... incorporating menus, ActionBars,

content providers, and databases... integrating media and animations... using web, map, and other services... supporting communication via messaging, contacts, and emails... publishing Android apps, and much more.

Software Error Detection through Testing and Analysis - J. C. Huang 2009-08-06

An in-depth review of key techniques in software error detection Software error detection is one of the most challenging problems in software engineering. Now, you can learn how to make the most of software testing by selecting test cases to maximize the probability of revealing latent errors. Software Error Detection through Testing and Analysis begins with a thorough discussion of test-case selection and a review of the concepts, notations, and principles used in the book. Next, it covers: Code-based test-case selection methods Specification-based test-case selection methods Additional advanced topics in testing Analysis of symbolic trace Static analysis Program instrumentation Each chapter begins

with a clear introduction and ends with exercises for readers to test their understanding of the material. Plus, appendices provide a logico-mathematical background, glossary, and questions for self-assessment. Assuming a basic background in software quality assurance and an ability to write nontrivial programs, the book is free of programming languages and paradigms used to construct the program under test. Software Error Detection through Testing and Analysis is suitable as a professional reference for software testing specialists, software engineers, software developers, and software programmers. It is also appropriate as a textbook for software engineering, software testing, and software quality assurance courses at the advanced undergraduate and graduate levels.

Software Engineering Education - Norman E. Gibbs 2012-12-06

Focus on masters' level education in software engineering. Topics discussed include: software

engineering principles, current software engineering curricula, experiences with existing courses, and the future of software engineering education.

Requirements Engineering for Software and Systems, Second Edition - Phillip A. Laplante 2013-10-17

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.

CIO Best Practices - Gary Cokins 2010-09-24
CIO BEST PRACTICES Enabling Strategic Value with Information Technology SECOND EDITION
For anyone who wants to achieve better returns on their IT investments, CIO Best Practices, Second Edition presents the leadership skills and competencies required of a CIO addressing comprehensive enterprise strategic frameworks to fully leverage IT resources. Filled with real-world examples of CIO success stories, the Second Edition explores: CIO leadership responsibilities and opportunities The business impacts of both business and social networking, as well as ways the CIO can leverage the new

reality of human connectivity on the Internet The increasingly inextricable relationships between customers, employees, and their use of personal information technologies Emerging cultural expectations and standards outside the workplace Current CRM best practices in terms of the relationship between customer preferences and shareholder wealth Enterprise energy utilization and sustainability practices—otherwise known as Green IT—with all the best practices collected here, in one place Best practices for one of the Internet's newest and most revolutionary technologies: cloud computing and ways it is shaping the new economics of business

An Integrated Approach to Software Engineering
- Pankaj Jalote 2013-06-29

It is clear that the development of large software systems is an extremely complex activity, which is full of various opportunities to introduce errors. Software engineering is the discipline that provides methods to handle this complexity

and enables us to produce reliable software systems with maximum productivity. An Integrated Approach to Software Engineering is different from other approaches because the various topics are not covered in isolation. A running case study is employed throughout the book, illustrating the different activity of software development on a single project. This work is important and instructive because it not only teaches the principles of software engineering, but also applies them to a software development project such that all aspects of development can be clearly seen on a project.

Software Engineering - Gregory W. Jones
1990-04-03

This one-semester undergraduate course introduces software engineering. A detailed guide to processes and products, this new text provides all the essential information needed to develop software engineering skills. The book offers in-depth coverage of all fundamental topics and includes follow-up projects in an

appendix for hands-on application. Each chapter is followed by a variety of open-ended problems that afford maximum flexibility in course use and encourage students to exhibit originality and judgment. An instructor's manual contains solutions to some of the problems, as well as suggested examinations and course schedules. There is also an extensive and easily accessible bibliography that provides opportunities for further study.

IEEE Standard Glossary of Software

Engineering Terminology - Institute of Electrical and Electronics Engineers 1990

Introduction to Software Testing - Paul Ammann
2008-01-28

Extensively class-tested, this textbook takes an innovative approach to software testing: it defines testing as the process of applying a few well-defined, general-purpose test criteria to a structure or model of the software. It incorporates the latest innovations in testing,

including techniques to test modern types of software such as OO, web applications, and embedded software. The book contains numerous examples throughout. An instructor's solution manual, PowerPoint slides, sample syllabi, additional examples and updates, testing tools for students, and example software programs in Java are available on an extensive website.

Software Engineering - Hans van Vliet 2001

INCOSE Systems Engineering Handbook -
INCOSE 2015-06-12

A detailed and thorough reference on the discipline and practice of systems engineering. The objective of the International Council on Systems Engineering (INCOSE) Systems Engineering Handbook is to describe key process activities performed by systems engineers and other engineering professionals throughout the life cycle of a system. The book covers a wide range of fundamental system

concepts that broaden the thinking of the systems engineering practitioner, such as system thinking, system science, life cycle management, specialty engineering, system of systems, and agile and iterative methods. This book also defines the discipline and practice of systems engineering for students and practicing professionals alike, providing an authoritative reference that is acknowledged worldwide. The latest edition of the INCOSE Systems Engineering Handbook: Is consistent with ISO/IEC/IEEE 15288:2015 Systems and software engineering—System life cycle processes and the Guide to the Systems Engineering Body of

Knowledge (SEBoK) Has been updated to include the latest concepts of the INCOSE working groups Is the body of knowledge for the INCOSE Certification Process This book is ideal for any engineering professional who has an interest in or needs to apply systems engineering practices. This includes the experienced systems engineer who needs a convenient reference, a product engineer or engineer in another discipline who needs to perform systems engineering, a new systems engineer, or anyone interested in learning more about systems engineering.

Software Engg Concepts - Fairley 2001-04