Object Oriented Software Engineering David Kung

This comprehensive and well-written book presents the fundamentals of object-oriented software engineering and discusses the recent technological developments in the field. It focuses on object-oriented software engineering in the context of an overall effort to present object-oriented concepts, techniques and models that can be applied in software estimation, analysis, design, testing and quality improvement. It applies unified modelling language notations to a series of examples with a real-life case study. The example-oriented approach followed in this book will help the readers in understanding and applying the concepts of object-oriented software engineering quickly and easily in various application domains. This book is designed for the undergraduate and postgraduate students of computer science and engineering, computer applications, and information technology. KEY FEATURES : Provides the foundation and important concepts of object-oriented paradigm. Presents traditional and object-oriented software development life cycle models with a special focus on Rational Unified Process model. Addresses important issues of improving software quality and measuring various object-oriented constructs using object-oriented metrics. Presents numerous diagrams to illustrate object-

oriented software engineering models and concepts. Includes a large number of solved examples, chapter-end review questions and multiple choice questions along with their answers.

All the ideas, examples and designs are drawn from the author's years of experience in designing object-oriented business models for Fortune 500 companies. This concise, practical book contains proven techniques on applying object technology for the design and analysis of business information systems (IS). Demonstrates how to overcome IS limitations in the re-engineering process. Provides information on analyzing, designing, and writing object-oriented software.

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.

This volume contains the proceedings of the 8th European Conference on Object-Oriented Programming (ECCOP '94), held in Bologna, Italy in July 1994. ECOOP is the premier European event on object-oriented programming and technology. The 25 full refereed papers presented in the volume were selected from 161 submissions; they are grouped in sessions on class design, concurrency, patterns, declarative programming, implementation, specification, dispatching, and experience. Together with the keynote speech "Beyond Objects" by Luc Steels (Brussels) and the invited paper "Putting Objects to Work" by Norbert A. Streitz (GMD-IPSI, Darmstadt) they offer an exciting perspective on object-oriented programming research and applications.

This is a practical guide for software developers, and different than other software architecture books. Here's why: It teaches risk-driven architecting. There is no need for meticulous designs when risks are small, nor any excuse for sloppy designs when risks threaten your success. This book describes a way to do just enough architecture. It avoids the one-size-fits-all process tar pit with advice on how to tune your design effort based on the risks you face. It democratizes architecture. This book seeks to make architecture relevant to all software developers. Developers need to understand how to use constraints as guiderails that ensure desired outcomes, and how seemingly small changes can affect a system's properties. It cultivates declarative knowledge. There is a difference between being able to hit a ball and knowing why you are able to hit it, what psychologists refer to as procedural knowledge versus declarative knowledge. This book will make you more aware of what you have been doing and provide names for the concepts. It emphasizes the engineering. This book focuses on the technical parts of software development and what developers do to ensure the system works not job titles or processes. It shows you how to build models and analyze architectures so that you can make principled design tradeoffs. It describes the techniques software designers use to reason about medium to large sized problems and points out where you can learn specialized

techniques in more detail. It provides practical advice. Software design decisions influence the architecture and vice versa. The approach in this book embraces drill-down/pop-up behavior by describing models that have various levels of abstraction, from architecture to data structure design.

This book presents the state of the art of research and development of computational reflection in the context of software engineering. Reflection has attracted considerable attention recently in software engineering, particularly from object-oriented researchers and professionals. The properties of transparency, separation of concerns, and extensibility supported by reflection have largely been accepted as useful in software development and design; reflective features have been included in successful software development technologies such as the Java language. The book offers revised versions of papers presented first at a workshop held during OOPSLA'99 together with especially solicited contributions. The papers are organized in topical sections on reflective and software engineering foundations, reflective software adaptability and evolution, reflective middleware, engineering Java-based reflective languages, and dynamic reconfiguration through reflection.

In OBJECT THINKING, esteemed object technologist David West contends that the mindset makes the programmer—not the tools and techniques. Delving into

the history, philosophy, and even politics of object-oriented programming, West reveals how the best programmers rely on analysis and conceptualization—on thinking—rather than formal process and methods. Both provocative and pragmatic, this book gives form to what's primarily been an oral tradition among the field's revolutionary thinkers—and it illustrates specific object-behavior practices that you can adopt for true object design and superior results. Gain an in-depth understanding of: Prerequisites and principles of object thinking. Object knowledge implicit in eXtreme Programming (XP) and Agile software development. Object conceptualization and modeling. Metaphors, vocabulary, and design for object development. Learn viable techniques for: Decomposing complex domains in terms of objects. Identifying object relationships, interactions, and constraints. Relating object behavior to internal structure and implementation design. Incorporating object thinking into XP and Agile practice. This book constitutes the refereed proceedings of the Third International Conference on Generative Programming and Component Engineering, GPCE 2004, held in Vancouver, Canada in October 2004. The 25 revised full papers presented together with abstracts of 2 invited talks were carefully reviewed and selected from 75 submissions. The papers are organized in topical sections on aspect-orientation, staged programming, types for meta-programming, meta-

programming, model-driven approaches, product lines, and domain-specific languages and generation.

This book addresses issues concerning the engineering of system prod ucts that make use of computing technology. These systems may be prod ucts in their own right, for example a computer, or they may be the computerised control systems inside larger products, such as factory automation systems, transportation systems and vehicles, and personal appliances such as portable telephones. In using the term engineering the authors have in mind a development process that operates in an integrated sequence of steps, employing defined techniques that have some scientific basis. Furthermore we expect the operation of the stages to be subject to controls and standards that result in a product fit for its intended purpose, both in the hands of its users and as a business venture. Thus the process must take account of a wide range of requirements relating to function, cost, size, reliabili ty and so on. It is more difficult to define the meaning of computing technology. These days this involves much more than computers and software. For example, many tasks that might be performed by software running in a general purpose computer can also be performed directly by the basic technology used to construct a computer, namely digital hardware. However, hardware need not always be digital; we live in an

analogue world, hence analogue signals appear on the boundaries of our systems and it can sometimes be advantageous to allow them to penetrate further.

This classroom-tested textbook presents an active-learning approach to the foundational concepts of software design. These concepts are then applied to a case study, and reinforced through practice exercises, with the option to follow either a structured design or object-oriented design paradigm. The text applies an incremental and iterative software development approach, emphasizing the use of design characteristics and modeling techniques as a way to represent higher levels of design abstraction, and promoting the model-view-controller (MVC) architecture. Topics and features: provides a case study to illustrate the various concepts discussed throughout the book, offering an in-depth look at the pros and cons of different software designs; includes discussion questions and hands-on exercises that extend the case study and apply the concepts to other problem domains; presents a review of program design fundamentals to reinforce understanding of the basic concepts; focuses on a bottom-up approach to describing software design concepts; introduces the characteristics of a good software design, emphasizing the model-view-controller as an underlying architectural principle; describes software design from both object-oriented and

structured perspectives; examines additional topics on human-computer interaction design, quality assurance, secure design, design patterns, and persistent data storage design; discusses design concepts that may be applied to many types of software development projects; suggests a template for a software design document, and offers ideas for further learning. Students of computer science and software engineering will find this textbook to be indispensable for advanced undergraduate courses on programming and software design. Prior background knowledge and experience of programming is required, but familiarity in software design is not assumed.

In OBJECT THINKING, esteemed object technologist David West contends that the mindset makes the programmer--not the tools and techniques. Delving into the history, philosophy, and even politics of object-oriented programming, West reveals how the best programmers rely on analysis and conceptualization--on thinking--rather than formal process and methods. Both provocative and pragmatic, this book gives form to what's primarily been an oral tradition among the field's revolutionary thinkers--and it illustrates specific object-behavior practices that you can adopt for true object design and superior results. Gain an in-depth understanding of: Prerequisites and principles of object thinking. Object knowledge implicit in eXtreme Programming (XP) and Agile software

development. Object conceptualization and modeling. Metaphors, vocabulary, and design for object development. Learn viable techniques for: Decomposing complex domains in terms of objects. Identifying object relationships, interactions, and constraints. Relating object behavior to internal structure and implementation design. Incorporating object thinking into XP and Agile practice.

The refereed proceedings of the 17th European Conference on Object-Oriented Programming, ECOOP 2003, held in Darmstadt, Germany in July 2003. The 18 revised full papers presented together with 2 invited papers were carefully reviewed and selected from 88 submissions. The papers are organized in topical sections on aspects and components; patterns, architecture, and collaboration; types; modeling; algorithms, optimization, and runtimes; and formal techniques and methodology.

This book constitutes the thoroughly refereed post-proceedings of the 14th International Smalltalk Conference, ISC 2006, held in Prague, Czech Republic in September 2006. Being a live forum on cutting edge software technologies, the conference attracted researchers and professionals from both academia and industry that produced papers covering topics from foundational issues to advanced applications.

This book shows how to develop software based on parts that interact primarily

through an event mechanism. The book demonstrates the use of events in all sorts of situations to solve recurring development problems without incurring coupling. A novel form of software diagram is introduced, called Signal Wiring Diagram. These diagrams are similar to the circuit diagrams used by hardware designers. A series of case studies concludes the book, bringing all the next concepts introduced together. Source code is provided in both C# and VB.NET Professionals in the interdisciplinary field of computer science focus on the design, operation, and maintenance of computational systems and software. Methodologies and tools of engineering are utilized alongside the technological advancements of computer applications to develop efficient and precise databases of information. The Handbook of Research on Innovations in Systems and Software Engineering combines relevant research from all facets of computer programming to provide a comprehensive look at the challenges and changes in the field. With information spanning topics such as design models, cloud computing, and security, this handbook is an essential reference source for academicians, researchers, practitioners, and students interested in the development and design of improved and effective technologies.

Written to appeal to both novice and veteran programmers, this complete and well-organized guide to the versatile and popular object-oriented programming language

Java shows how to use it as a primary tool in many different aspects of one's programming work. It emphasizes the importance of good programming style—particularly the need to maintain an object's integrity from outside interference—and helps users harness the power of Java in object-oriented programming to create their own interesting and practical every-day applications. Discusses the basics of computer systems, and describes the fundamental elements of the Java language, with complete instructions on how to compile and run a simple program. Introduces fundamental object-oriented concepts, and shows how simple classes may be defined from scratch. Explores Java's exception-handling mechanism, and investigates Java's interface facility (i.e., polymorphism). Covers all Java applications, including use of the Abstract Windowing Toolkit, graphical programming, networking, and simulation. Includes numerous exercises, periodic reviews, case studies, and supporting visuals. For those in the computer science industry.

More than ever, mission-critical and business-critical applications depend on object-oriented (OO) software. Testing techniques tailored to the unique challenges of OO technology are necessary to achieve high reliability and quality. "Testing Object-Oriented Systems: Models, Patterns, and Tools" is an authoritative guide to designing and automating test suites for OO applications. This comprehensive book explains why testing must be model-based and provides in-depth coverage of techniques to develop testable models from state machines, combinational logic, and the Unified Modeling

Language (UML). It introduces the test design pattern and presents 37 patterns that explain how to design responsibility-based test suites, how to tailor integration and regression testing for OO code, how to test reusable components and frameworks, and how to develop highly effective test suites from use cases. Effective testing must be automated and must leverage object technology. The author describes how to design and code specification-based assertions to offset testability losses due to inheritance and polymorphism. Fifteen micro-patterns present oracle strategies--practical solutions for one of the hardest problems in test design. Seventeen design patterns explain how to automate your test suites with a coherent OO test harness framework. The author provides thorough coverage of testing issues such as: The bug hazards of OO programming and differences from testing procedural code How to design responsibility-based tests for classes, clusters, and subsystems using class invariants, interface data flow models, hierarchic state machines, class associations, and scenario analysis How to support reuse by effective testing of abstract classes, generic classes, components, and frameworks How to choose an integration strategy that supports iterative and incremental development How to achieve comprehensive system testing with testable use cases How to choose a regression test approach How to develop expected test results and evaluate the post-test state of an object How to automate testing with assertions, OO test drivers, stubs, and test frameworks Real-world experience, world-class best practices, and the latest research in object-oriented testing are included.

Practical examples illustrate test design and test automation for Ada 95, C++, Eiffel, Java, Objective-C, and Smalltalk. The UML is used throughout, but the test design patterns apply to systems developed with any OO language or methodology. 0201809389B04062001

This book is the first to bring together the techniques of object modelling, advanced software engineering and simulation modelling in a comprehensive guide for students and professionals. By offering an introduction to simulation and state-of-the-art object model concepts, it enables readers to master modelling techniques which meet the challenges inherent in the design and utilization of complex software systems. Following an extensive study of the major object-oriented analysis and design techniques, David Hill shows how a modelling method adapted to simulation can be translated to industrial and research applications. It illustrates how to generate automatic simulation code for the simulation and animation of manufacturing systems, and thus is the only text to provide object-oriented code generation techniques and present the design of a simulation animation builder. Finally, the book includes detailed appendices on simulation languages and an introduction to the C++ programming language.

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.
This concise book addresses the actual details involved with using CRC cards, including coverage of the team approach to analysis and examples of program code (Java, C++, and Smalltalk) derived from the use of the CRC card method.
Software development has been a troubling since it first started. There are seven chronic problems that have plagued it from the beginning: Incomplete and ambiguous user requirements that grow by >2% per month. Major cost and schedule overruns for large applications > 35% higher than planned. Low defect removal efficiency (DRE) Cancelled projects that are not completed: > 30% above 10,000 function points. Poor quality and low reliability after the software is delivered: > 5 bugs per FP. Breach of contract litigation against software outsource vendors. Expensive maintenance and enhancement costs after delivery. These are endemic problems for software executives, software engineers and software customers but they are not insurmountable. In Software Development Patterns and Antipatterns, software engineering and metrics pioneer Capers Jones presents technical solutions for all seven. The solutions involve moving from harmful patterns of software development to effective patterns of software development. The first section of the book examines common software development problems that have been observed in many companies and government agencies. The data on the problems comes from consulting studies,

breach of contract lawsuits, and the literature on major software failures. This section considers the factors involved with cost overruns, schedule delays, canceled projects, poor quality, and expensive maintenance after deployment. The second section shows patterns that lead to software success. The data comes from actual companies. The section's first chapter on Corporate Software Risk Reduction in a Fortune 500 company was based on a major telecom company whose CEO was troubled by repeated software failures. The other chapters in this section deal with methods of achieving excellence, as well as measures that can prove excellence to C-level executives, and with continuing excellence through the maintenance cycle as well as for software development.

This journal is devoted to aspect-oriented software development (AOSD) techniques in the context of all phases of the software life cycle, from requirements and design to implementation, maintenance and evolution. The focus of the journal is on approaches for systematic identification, modularization, representation and composition of crosscutting concerns, evaluation of such approaches and their impact on improving quality attributes of software systems.

One of the most important reasons for the current intensity of interest in agent technology is that the concept of an agent, as an autonomous system capable of interacting with other agents in order to satisfy its design objectives, is a natural one for software designers. Just as we can understand many systems as being composed of

essentially passive objects, which have a state and upon which we can perform operations, so we can understand many others as being made up of interacting semi-autonomous agents. This book brings together revised versions of papers presented at the First International Workshop on Agent-Oriented Software Engineering, AOSE 2000, held in Limerick, Ireland, in conjunction with ICSE 2000, and several invited papers. As a comprehensive and competent overview of agent-oriented software engineering, the book addresses software engineers interested in the new paradigm and technology as well as research and development professionals active in agent technology.

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Features the best practices in the art and science of constructing software--topics include design, applying good techniques to construction, eliminating errors, planning, managing construction activities, and relating personal character to superior software. Original. (Intermediate)

This book covers the essential knowledge and skills needed by a student who is specializing in software engineering. Readers will learn principles of object orientation, software development, software modeling, software design, requirements analysis, and testing. The use of the Unified Modelling Language to develop software is taught in depth. Many concepts are illustrated using complete examples, with code written in Java.

The 3rd International Workshop on Software Engineering and Middleware {SEM 2002) was held May 20-21, 2002, in Orlando, Florida, as a co-located event of the 2002 International Conference on Software Engineering. The workshop attracted 30 participants from academic and industrial institutions in many countries. Twenty-seven papers were submitted, of which 15 were accepted to create a broad program covering the topics of architectures, specification, components and adaptations, technologies, and services. The focus of the workshop was on short presentations, with substantial dis cussions afterwards. Thus, we decided to include in this proceedings also a short summary of every technical session, which was written by some of the partici pants at the workshop. The workshop invited one keynote speaker, Bobby Jadhav of CalKey, who presented a talk on the design and use of model-driven architecture and middle ware in industry. We would like to thank all the people who helped organize and run the workshop. In particular, we would like to thank the program committee for their careful reviews of the submitted papers, Wolfgang Emmerich for being an excellent General Chair, and the participants for a lively and interesting workshop.

This book constitutes the refereed proceedings of the 7th International Symposium on Search-Based Software Engineering, SSBSE 2015, held in

Bergamo, Italy, in September 2015. The 12 revised full papers presented together with 2 invited talks, 4 short papers, 2 papers of the graduate track, and 13 challenge track papers were carefully reviewed and selected from 51 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.

This book constitutes the refereed proceedings of the 8th International Conference on Object-Oriented Information Systems, OOIS 2002, held in Montpellier, France, in September 2002. The 34 revised full papers and 17 short papers presented were carefully reviewed and selected from 116 submissions. The papers are organized in topical sections on developing web services, object databases, XML and web, component and ontology, UML modeling, object modeling and information systems adaptation, e-business models and workflow, performance and method evaluation, programming and tests, software engineering metries, web-based information systems, architecture and Corba, and roles and evolvable objects.

This book constitutes the thoroughly refereed post-proceedings of the Second International Symposium on Generative and Component-Based Software

Engineering, GCSE 2000, held in Erfurt, Germany in October 2000. The twelve revised full papers presented with two invited keynote papers were carefully reviewed and selected from 29 submissions. The book offers topical sections on aspects and patterns, models and paradigms, components and architectures, and Mixin-based composition and metaprogramming.

Test-Driven Development (TDD) is now an established technique for delivering better software faster. TDD is based on a simple idea: Write tests for your code before you write the code itself. However, this "simple" idea takes skill and judgment to do well. Now there's a practical guide to TDD that takes you beyond the basic concepts. Drawing on a decade of experience building real-world systems, two TDD pioneers show how to let tests guide your development and “grow” software that is coherent, reliable, and maintainable. Steve Freeman and Nat Pryce describe the processes they use, the design principles they strive to achieve, and some of the tools that help them get the job done. Through an extended worked example, you’ll learn how TDD works at multiple levels, using tests to drive the features and the object-oriented structure of the code, and using Mock Objects to discover and then describe relationships between objects. Along the way, the book systematically addresses challenges that development teams encounter with TDD—from integrating TDD into your processes to testing your

most difficult features. Coverage includes Implementing TDD effectively: getting started, and maintaining your momentum throughout the project Creating cleaner, more expressive, more sustainable code Using tests to stay relentlessly focused on sustaining quality Understanding how TDD, Mock Objects, and Object-Oriented Design come together in the context of a real software development project Using Mock Objects to guide object-oriented designs Succeeding where TDD is difficult: managing complex test data, and testing persistence and concurrency

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

software project. Both have sample deliverables and thus provide the reader with examples of the type of work readers are to create. This book is appropriate for readers looking to gain experience in project analysis, design implementation, and testing.

This one - of - a - kind manual is for any programmer building applications on IBM's industrial - strength Smalltalk compiler. Practical, instructive, and useful, this book was developed with the help of IBM's software engineers and supports all IBM Smalltalk products. This indispensable guide offers easy reference with liberal cross - referencing and indexing and gives the professional programmer a complete reference to Smalltalk syntax and commands.

Object-Oriented Software Engineering: An Agile Unified Methodology by David Kung presents a step-by-step methodology that integrates modeling and design, UML, patterns, test-driven development, quality assurance, configuration management, and agile principles throughout the life cycle. The overall approach is casual and easy to follow, with many practical examples that show the theory at work. The author uses his experiences as well as real-world stories to help the reader understand software design principles, patterns, and other software engineering concepts. The book also provides stimulating exercises that go far beyond the type of question that can be answered by simply copying portions of

the text.

"The first edition set a standard of excellence that has eluded all followers, and I have recommended it to my clients for years. The new edition is a gift to the field and should be required reading for all managers." - Adrian J. Bowles, Ph.D., Vice President Giga Information Group "One of the most readable introductions you will find. The new edition offers vital insights into the effective use of objects in business." - Chris Stone, President Object Management Group The first edition of Object Technology: A Manager's Guide is widely viewed as the classic introduction to this powerful computing concept. Object technology offers increased agility, significant time-to-market reduction, and the opportunity to exploit the potential of the World Wide Web by deploying globally distributed business systems. At a time when many of the world's largest companies are making the transition to object technology, David Taylor has updated his book to address the important issues facing the growth of object technology and to provide a glimpse into the future of this evolving paradigm. In updating this seminal work, David Taylor has retained the signature conciseness and,clarity of discussion that made the first edition a best-seller. Object Technology: A Manager's Guide, Second Edition, covers the key terms, emerging concepts, and useful applications of objects. Managers, salespeople, engineers, software

developers-anyone interested in understanding or implementing object technology-will find this a lucid introduction to the topic. Highlights of this new edition include: An explanation of how to use objects to create evolutionary software that rapidly adapts to changing business conditions, eliminating the need for most new application development. An introduction to Java, and an explanation of how its use of message interfaces enables a new generation of portable, mix-and-match, Internet-enabled business objects. An update on the state of object databases and extended relational databases, with guidelines for combining the two for optimal information storage. An introduction to the new generation of object engines and how they combine storage and execution capabilities for maximum software integration. 0201309947B09102001 Embedded systems are ubiquitous. They appear in cell phones, microwave ovens, refrigerators, consumer electronics, cars, and jets. Some of these embedded s- tems are safety- or security-critical such as in medical equipment, nuclear plants, and X-by-wire control systems in naval, ground and aerospace transportation - hicles. With the continuing shift from hardware to software, embedded systems are increasingly dominated by embedded software. Embedded software is complex. Its engineering inherently involves a mul- disciplinary interplay with the physics of the embedding system or environment.

Embedded software also comes in ever larger quantity and diversity. The next generation of premium automobiles will carry around one gigabyte of binary code. The proposed US DDX submarine is e?ectively a ?oating embedded so-ware system, comprising 30 billion lines of code written in over 100 programming languages. Embedded software is expensive. Cost estimates are quoted at around US$15– 30 per line (from commencement to shipping). In the defense realm, costs can range up to $100, while for highly critical applications, such as the Space Shuttle, the cost per line approximates $1,000. In view of the exponential increase in complexity, the projected costs of future embedded software are staggering.