

Python For Software Design Cambridge University Press

Strategies for building large systems that can be easily adapted for new situations with only minor programming modifications. Time pressures encourage programmers to write code that works well for a narrow purpose, with no room to grow. But the best systems are evolvable; they can be adapted for new situations by adding code, rather than changing the existing code. The authors describe techniques they have found effective--over their combined 100-plus years of programming experience--that will help programmers avoid programming themselves into corners. The authors explore ways to enhance flexibility by:

- Organizing systems using combinators to compose mix-and-match parts, ranging from small functions to whole arithmetics, with standardized interfaces
- Augmenting data with independent annotation layers, such as units of measurement or provenance
- Combining independent pieces of partial information using unification or propagation
- Separating control structure from problem domain with domain models, rule systems and pattern matching, propagation, and dependency-directed backtracking
- Extending the programming language, using dynamically extensible evaluators

A no-nonsense introduction to software design using the Python programming language. Written for people with no programming experience, this book starts with the most basic concepts and gradually adds new material. Some of the ideas students find most challenging, like recursion and object-oriented programming, are divided into a sequence of smaller steps and introduced over the course of several chapters. The focus is on the programming process, with special emphasis on debugging. The book includes a wide range of

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exercises, from short examples to substantial projects, so that students have ample opportunity to practise each new concept. Exercise solutions and code examples are available from thinkpython.com, along with Swampy, a suite of Python programs that is used in some of the exercises.

This book constitutes the proceedings of the 11th International Conference on Informatics in Schools: Situation, Evolution and Perspectives, ISSEP 2018, held in St. Petersburg, Russia, in October 2018. The 29 full papers presented in this volume were carefully reviewed and selected from 74 submissions. They were organized in topical sections named: role of programming and algorithmics in informatics for pupils of all ages; national concepts of teaching informatics; teacher education in informatics; contests and competitions in informatics; socio-psychological aspects of teaching informatics; and computer tools in teaching and studying informatics.

Demonstrating the influence of Semiotic Engineering in Human-Computer Interaction, this book focuses on the work of one of the pioneers of the field - Clarisse de Souza - and her influence on this broad and wide-ranging area of research. It contains a selection of essays written by those that have worked with her over the years and will encourage readers to extend their reading and research in this area. Clarisse de Souza, widely known as the founder of Semiotic Engineering, will reach her 60th birthday in 2017, and the Semiotic Engineering Research Group that she founded will also celebrate its 20th anniversary. A key figure in HCI, Clarisse argued that human-computer interaction enables computer-mediated communication between the designer and the user at the point of interaction thus enabling and facilitating designers in understanding who their users are, and what their requirements may be. This book brings together prominent researchers who have helped to shape

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semiotic engineering by their insightful discussions on the theory.

"This book presents current research on all aspects of domain-specific language for scholars and practitioners in the software engineering fields, providing new results and answers to open problems in DSL research"--

BRONZE RUNNER UP: Axiom Awards 2018 - Business Technology Category (1st edition) Coding is one of the most in-demand skills in the job market. Whether you're an entrepreneur, a recent graduate or a professional, you can supercharge your career simply by grasping the fundamentals, and Confident Coding is here to help. This new and improved second edition of the award-winning book gives you a step-by-step learning guide to HTML, CSS, JavaScript, Python, building iPhone and Android apps and debugging. For entrepreneurs, being able to create your own website or app can grant you valuable freedom and revolutionize your business. For aspiring developers, this book will give you the building blocks to embark on your career path. For working professionals, coding skills can add a valuable edge to your CV. Whatever your professional profile, if you want to master the fundamentals of coding and kick start your career, Confident Coding is the book for you. About the Confident series... From coding and web design to data, digital content and cyber security, the Confident books are the perfect beginner's resource for enhancing your professional life, whatever your career path.

Now that people are aware that data can make the difference in an election or a business model, data science as an occupation is gaining ground. But how can you get started working in a wide-ranging, interdisciplinary field that's so clouded in hype? This insightful book, based on Columbia University's Introduction to Data Science class, tells you what you need to know. In many of these chapter-long lectures,

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data scientists from companies such as Google, Microsoft, and eBay share new algorithms, methods, and models by presenting case studies and the code they use. If you're familiar with linear algebra, probability, and statistics, and have programming experience, this book is an ideal introduction to data science. Topics include: Statistical inference, exploratory data analysis, and the data science process Algorithms Spam filters, Naive Bayes, and data wrangling Logistic regression Financial modeling Recommendation engines and causality Data visualization Social networks and data journalism Data engineering, MapReduce, Pregel, and Hadoop Doing Data Science is collaboration between course instructor Rachel Schutt, Senior VP of Data Science at News Corp, and data science consultant Cathy O'Neil, a senior data scientist at Johnson Research Labs, who attended and blogged about the course.

This textbook provides a comprehensive and reader-friendly introduction to the field of computational social science (CSS). Presenting a unified treatment, the text examines in detail the four key methodological approaches of automated social information extraction, social network analysis, social complexity theory, and social simulation modeling. This updated new edition has been enhanced with numerous review questions and exercises to test what has been learned, deepen understanding through problem-solving, and to practice writing code to implement ideas. Topics and features: contains more than a thousand questions and exercises, together with a list of acronyms and a glossary; examines the similarities and differences between computers and social systems; presents a focus on automated information extraction; discusses the measurement, scientific laws, and generative theories of social complexity in CSS; reviews the methodology of social simulations, covering both

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variable- and object-oriented models.

Python for Software Design
How to Think Like a
Computer Scientist
Cambridge University Press

A no-nonsense introduction to software design using the Python programming language, for people with no programming experience.

A vital new publication for scientists and researchers in the field, this book constitutes the refereed proceedings of the 8th International Conference on Product Focused Software Process Improvement, PROFES 2007, held in Riga, Latvia in July 2007. The 29 revised full papers, along with four reports on workshops and tutorials and four keynote addresses were carefully reviewed and selected from 55 submissions. The papers constitute a balanced mix of academic and industrial aspects; they are organized in topical sections for ease of reference. Python is rapidly becoming the de facto standard language for systems integration. Python has a large user and developer-base external to the neuroscience community, and a vast module library that facilitates rapid and maintainable development of complex and intricate systems. In this Research Topic, we highlight recent efforts to develop Python modules for the domain of neuroscience software and neuroinformatics: - simulators and simulator interfaces - data collection and analysis - sharing, re-use, storage and databasing of models and data - stimulus generation - parameter search and optimization - visualization - VLSI hardware interfacing. Moreover, we seek to provide a representative overview of existing mature Python modules for neuroscience and neuroinformatics, to

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demonstrate a critical mass and show that Python is an appropriate choice of interpreter interface for future neuroscience software development.

By taking you through the development of a real web application from beginning to end, the second edition of this hands-on guide demonstrates the practical advantages of test-driven development (TDD) with Python. You'll learn how to write and run tests before building each part of your app, and then develop the minimum amount of code required to pass those tests. The result? Clean code that works. In the process, you'll learn the basics of Django, Selenium, Git, jQuery, and Mock, along with current web development techniques. If you're ready to take your Python skills to the next level, this book--updated for Python 3.6--clearly demonstrates how TDD encourages simple designs and inspires confidence. Dive into the TDD workflow, including the unit test/code cycle and refactoring Use unit tests for classes and functions, and functional tests for user interactions within the browser Learn when and how to use mock objects, and the pros and cons of isolated vs. integrated tests Test and automate your deployments with a staging server Apply tests to the third-party plugins you integrate into your site Run tests automatically by using a Continuous Integration environment Use TDD to build a REST API with a front-end Ajax interface

Object detection, tracking and recognition in images are key problems in computer vision. This book provides the reader with a balanced treatment between the theory and practice of selected methods in these areas to make

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the book accessible to a range of researchers, engineers, developers and postgraduate students working in computer vision and related fields. Key features: Explains the main theoretical ideas behind each method (which are augmented with a rigorous mathematical derivation of the formulas), their implementation (in C++) and demonstrated working in real applications. Places an emphasis on tensor and statistical based approaches within object detection and recognition. Provides an overview of image clustering and classification methods which includes subspace and kernel based processing, mean shift and Kalman filter, neural networks, and k-means methods. Contains numerous case study examples of mainly automotive applications. Includes a companion website hosting full C++ implementation, of topics presented in the book as a software library, and an accompanying manual to the software platform.

For more than 40 years, Computerworld has been the leading source of technology news and information for IT influencers worldwide. Computerworld's award-winning Web site (Computerworld.com), twice-monthly publication, focused conference series and custom research form the hub of the world's largest global IT media network.

This book constitutes the refereed proceedings of the 13th International Conference on Evaluation of Novel Approaches to Software Engineering, ENASE 2018, held in Funchal, Madeira, Portugal, in March 2018. The 17 revised full papers and 5 revised short papers presented were carefully reviewed and selected from 95

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submissions. The papers are organized in topical sections on service science and business information systems and software engineering.

"This book provides integrated chapters on software engineering and enterprise systems focusing on parts integrating requirements engineering, software engineering, process and frameworks, productivity technologies, and enterprise systems"--Provided by publisher.

This book constitutes the refereed proceedings of the 8th International Symposium on Functional and Logic Programming, FLOPS 2006, held in Fuji-Susono, Japan, in April 2006. The 17 revised full papers presented together with 2 invited contributions were carefully reviewed and selected from 51 submissions. The papers are organized in topical sections on data types, FP extensions, type theory, LP extensions, analysis, contracts, as well as Web and GUI.

Beginner coders often gravitate to the easy-to-use Python language for its versatility and usability. Games, robots, and Web sites—including those of Google and YouTube—and much more run on Python, and developers are constantly collaborating to improve the language and address problem areas. This volume introduces readers to Python, exploring its various applications and the history of its development. Side-by-side comparisons with other languages are also included to show the benefits of Python, while interviews with programmers highlight its many real-world applications. This book gathers selected papers presented at the 2020 World Conference on Information Systems and

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Technologies (WorldCIST'20), held in Budva, Montenegro, from April 7 to 10, 2020. WorldCIST provides a global forum for researchers and practitioners to present and discuss recent results and innovations, current trends, professional experiences with and challenges regarding various aspects of modern information systems and technologies. The main topics covered are A) Information and Knowledge Management; B) Organizational Models and Information Systems; C) Software and Systems Modeling; D) Software Systems, Architectures, Applications and Tools; E) Multimedia Systems and Applications; F) Computer Networks, Mobility and Pervasive Systems; G) Intelligent and Decision Support Systems; H) Big Data Analytics and Applications; I) Human–Computer Interaction; J) Ethics, Computers & Security; K) Health Informatics; L) Information Technologies in Education; M) Information Technologies in Radiocommunications; and N) Technologies for Biomedical Applications.

Guzdial introduces programming as a way of creating and manipulating mediaa context familiar and intriguing to today's readers. Starts readers with actual programming early on. Puts programming in a relevant context (Computing for Communications). Includes implementing Photoshop-like effects, reversing/splicing sounds, creating animations. Acknowledges that readers in this audience care about the Web; introduces HTML and covers writing programs that generate HTML. Uses the Web as a Data Source; shows readers how to read from files, but also how to write programs to directly read Web pages and distill information from there for use in

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other calculations, other Web pages, etc. (examples include temperature from a weather page, stock prices from a financials page). A comprehensive guide for anyone interested in learning the basics of programming with one of the best web languages, Python.

The authors analyze how the structure of a package determines its developmental complexity according to such measures as bug search times and documentation information content. The work presents arguments for why these issues impact solution cost and time more than does scalable performance. The final chapter explores the question of scalable execution and shows how scalable design relates to scalable execution. The book's focus is on program organization, which has received considerable attention in the broader software engineering community, where graphical description standards for modeling software structure and behavior have been developed by computer scientists. These discussions might be enriched by engineers who write scientific codes. This book aims to bring such scientific programmers into discussion with computer scientists. The authors do so by introducing object-oriented software design patterns in the context of scientific simulation.

This book constitutes thoroughly revised and selected papers from the 7th International Conference on Model-Driven Engineering and Software Development, MODELSWARD 2019, held in Prague, Czech Republic, in February 2019. The 16 thoroughly revised and extended papers presented in this volume were carefully reviewed and selected from 76 submissions. They

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address some of the most relevant challenges being faced by researchers and practitioners in the field of model-driven engineering and software development and cover topics like language design and tooling; programming support tools; code and text generation from models, behavior modeling and analysis; model transformations and multi-view modeling; as well as applications of MDD and its related techniques to cyber-physical systems, cyber security, IoT, autonomous vehicles and healthcare.

Master modern web and network data modeling: both theory and applications. In *Web and Network Data Science*, a top faculty member of Northwestern University's prestigious analytics program presents the first fully-integrated treatment of both the business and academic elements of web and network modeling for predictive analytics. Some books in this field focus either entirely on business issues (e.g., Google Analytics and SEO); others are strictly academic (covering topics such as sociology, complexity theory, ecology, applied physics, and economics). This text gives today's managers and students what they really need: integrated coverage of concepts, principles, and theory in the context of real-world applications. Building on his pioneering Web Analytics course at Northwestern University, Thomas W. Miller covers usability testing, Web site performance, usage analysis, social media platforms, search engine optimization (SEO), and many other topics. He balances this practical coverage with accessible and up-to-date introductions to both social network analysis and network science, demonstrating

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how these disciplines can be used to solve real business problems.

The first volume of the POSA pattern series introduced a broad-spectrum of general-purpose patterns in software design and architecture. The second narrowed the focus to fundamental patterns for building sophisticated concurrent and networked software systems and applications. This volume uses design patterns to present techniques for implementing effective resource management in a system. The patterns are covered in detail making use of several examples providing directions to the readers on how to implement the presented patterns. Additionally, the volume presents a thorough introduction into resource management and a case study where the patterns are applied to the domain of mobile radio networks. The patterns are grouped by different areas of resource management and hence address the complete lifecycle of resources: resource acquisition, coordination and release. Software Engineering is a multifaceted and expanding topic. It aims to provide theories, methods and tools to tackle the complexity of software systems, from development to maintenance. Its complexity is made even more severe today by rapid advances in technology, the pervasiveness of software in all areas of society, and the globalization of software development. The continuous expansion of the field presents the

problem of how to keep up for practitioners. For educators, the key questions are how should software engineers be educated and what are the core topics and key technologies? Even looking only at the last decade, the tremendous changes that have taken place in the software engineering industry, and in the industrial world in general, raise many questions. What are the effects of: Outsourcing? Distributed software development? Open source? Standardization? Software patents? Mod-driven development? How should these developments change the way we teach software engineering? Should textbooks be updated? Should software engineering play a different role in the computer science curriculum, for example, be more pervasive? How are instructors in universities handling these issues? All these issues were discussed at the Software Education and Training sessions at the International Conference on Software Engineering (ICSE 2005) by leading researchers, educators, and practitioners in software engineering, who presented their—sometimes controversial—views and insights on software engineering education in the new millennium. In this volume we have collected some of the most representative and innovative approaches that were presented at the workshop. The authors revised their papers based on discussions at the conference and the comments they received from the reviews.

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Over 70 recipes to get you started with popular Python libraries based on the principal concepts of data visualization

About This Book Learn how to set up an optimal Python environment for data visualization Understand how to import, clean and organize your data Determine different approaches to data visualization and how to choose the most appropriate for your needs

Who This Book Is For If you already know about Python programming and want to understand data, data formats, data visualization, and how to use Python to visualize data then this book is for you.

What You Will Learn

- Introduce yourself to the essential tooling to set up your working environment
- Explore your data using the capabilities of standard Python Data Library and Panda Library
- Draw your first chart and customize it
- Use the most popular data visualization Python libraries
- Make 3D visualizations mainly using mplot3d
- Create charts with images and maps
- Understand the most appropriate charts to describe your data
- Know the matplotlib hidden gems
- Use plot.ly to share your visualization online

In Detail Python Data Visualization Cookbook will progress the reader from the point of installing and setting up a Python environment for data manipulation and visualization all the way to 3D animations using Python libraries. Readers will benefit from over 60 precise and reproducible recipes that will guide the reader towards a better understanding of data

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concepts and the building blocks for subsequent and sometimes more advanced concepts. Python Data Visualization Cookbook starts by showing how to set up matplotlib and the related libraries that are required for most parts of the book, before moving on to discuss some of the lesser-used diagrams and charts such as Gantt Charts or Sankey diagrams. Initially it uses simple plots and charts to more advanced ones, to make it easy to understand for readers. As the readers will go through the book, they will get to know about the 3D diagrams and animations. Maps are irreplaceable for displaying geo-spatial data, so this book will also show how to build them. In the last chapter, it includes explanation on how to incorporate matplotlib into different environments, such as a writing system, LaTeX, or how to create Gantt charts using Python. Style and approach A step-by-step recipe based approach to data visualization. The topics are explained sequentially as cookbook recipes consisting of a code snippet and the resulting visualization.

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About This Book

- Learn how to set up an optimal Python environment for data visualization
- Understand how to import, clean and organize your data
- Determine different approaches to data visualization and how to choose the most

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appropriate for your needs Who This Book Is For If you already know about Python programming and want to understand data, data formats, data visualization, and how to use Python to visualize data then this book is for you. What You Will Learn

- Introduce yourself to the essential tooling to set up your working environment
- Explore your data using the capabilities of standard Python Data Library and Panda Library
- Draw your first chart and customize it
- Use the most popular data visualization Python libraries
- Make 3D visualizations mainly using mplot3d
- Create charts with images and maps
- Understand the most appropriate charts to describe your data
- Know the matplotlib hidden gems
- Use plot.ly to share your visualization online

Detail Python Data Visualization Cookbook will progress the reader from the point of installing and setting up a Python environment for data manipulation and visualization all the way to 3D animations using Python libraries. Readers will benefit from over 60 precise and reproducible recipes that will guide the reader towards a better understanding of data concepts and the building blocks for subsequent and sometimes more advanced concepts. Python Data Visualization Cookbook starts by showing how to set up matplotlib and the related libraries that are required for most parts of the book, before moving on to discuss some of the lesser-used diagrams and charts such as

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Gantt Charts or Sankey diagrams. Initially it uses simple plots and charts to more advanced ones, to make it easy to understand for readers. As the readers will go through the book, they will get to know about the 3D diagrams and animations. Maps are irreplaceable for displaying geo-spatial data, so this book will also show how to build them. In the last chapter, it includes explanation on how to incorporate matplotlib into different environments, such as a writing system, LaTeX, or how to create Gantt charts using Python. Style and approach A step-by-step recipe based approach to data visualization. The topics are explained sequentially as cookbook recipes consisting of a code snippet and the resulting visualization.

The contemporary design practice known as data sonification allows us to experience information in data by listening. In doing so, we understand the source of the data in ways that support, and in some cases surpass, our ability to do so visually. In order to assist us in negotiating our environments, our senses have evolved differently. Our hearing affords us unparalleled temporal and locational precision. Biological survival has determined that the ears lead the eyes. For all moving creatures, in situations where sight is obscured, spatial auditory clarity plays a vital survival role in determining both from where the predator is approaching or to where the prey has escaped. So, when designing methods that enable

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listeners to extract information from data, both with and without visual support, different approaches are necessary. A scholarly yet approachable work by one of the recognized leaders in the field of auditory design, this book will - Lead you through some salient historical examples of how non-speech sounds have been used to inform and control people since ancient times. - Comprehensively summarize the contemporary practice of Data Sonification. - Provide a detailed overview of what information is and how our auditory perceptions can be used to enhance our knowledge of the source of data. - Show the importance of the dynamic relationships between hearing, cognitive load, comprehension, embodied knowledge and perceptual truth. - Discuss the role of aesthetics in the dynamic interplay between listenability and clarity. - Provide a mature software framework that supports the practice of data sonification design, together with a detailed discussion of some of the design principles used in various examples. David Worrall is an internationally recognized composer, sound artist and interdisciplinary researcher in the field of auditory design. He is Professor of Audio Arts and Acoustics at Columbia College Chicago and a former elected president of the International Community for Auditory Display (ICAD), the leading organization in the field since its inception over 25 years ago. Code and audio examples for this book are available at

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<https://github.com/david-worrall/springer/> Here is an excellent review of the book by Dr Gregory Kramer: “Worrall proceeds bravely through the trees and vines of philosophy, information theory, aesthetics, and other contributors to sonification design theory. It’s a feat. He nails all of this down with the specific implementation system he’s designed over many years, and applies his theories to specific problems. In a field of research still in its first half century and setting its bearings in a world where human perception has become a sideshow to machine learning, deep learning, and artificial intelligence, the roots David provides will serve well.” Dr Gregory Kramer is the founding figure in the emerging field of sonification, founded the International Conference on Auditory Display (ICAD) and editor of the first book in the field, "Auditory Display: Sonification, Audification and Auditory Interfaces" (Addison Wesley, 1994). Python for Software Design is a concise introduction to software design using the Python programming language. Intended for people with no programming experience, this book starts with the most basic concepts and gradually adds new material. Some of the ideas students find most challenging, like recursion and object-oriented programming, are divided into a sequence of smaller steps and introduced over the course of several chapters. The focus is on the programming process, with special emphasis on debugging. The book includes a wide

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range of exercises, from short examples to substantial projects, so that students have ample opportunity to practice each new concept. Exercise solutions and code examples are available from thinkpython.com, along with Swampy, a suite of Python programs that is used in some of the exercises.

This book provides an overview of the application of statistical methods to problems in metrology, with emphasis on modelling measurement processes and quantifying their associated uncertainties. It covers everything from fundamentals to more advanced special topics, each illustrated with case studies from the authors' work in the Nuclear Security Enterprise (NSE). The material provides readers with a solid understanding of how to apply the techniques to metrology studies in a wide variety of contexts. The volume offers particular attention to uncertainty in decision making, design of experiments (DOEx) and curve fitting, along with special topics such as statistical process control (SPC), assessment of binary measurement systems, and new results on sample size selection in metrology studies. The methodologies presented are supported with R script when appropriate, and the code has been made available for readers to use in their own applications. Designed to promote collaboration between statistics and metrology, this book will be of use to practitioners of metrology as well as students and

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researchers in statistics and engineering disciplines. Cambridge International AS and A Level Computer Science offers a complete set of resources to accompany the 9608 syllabus. This revision guide helps students to prepare and practice skills for the Cambridge AS and A Level Computer Science examination. It contains clear explanations and key information to support learners, with additional practice questions to help students feel confident and reinforce their understanding of key concepts. normalconferencestandards. Following an intensive one-week discussion the Programme Committee selected 15 papers for this volume.

As modern technologies continue to develop and evolve, the ability of users to interface with new systems becomes a paramount concern. Research into new ways for humans to make use of advanced computers and other such technologies is necessary to fully realize the potential of twenty-first-century tools. Innovative Methods, User-Friendly Tools, Coding, and Design Approaches in People-Oriented Programming is a critical scholarly resource that examines development and customization user interfaces for advanced technologies and how these interfaces can facilitate new developments in various fields. Featuring coverage on a broad range of topics such as role-based modeling, end-user composition, and wearable computing, this book is a vital reference source for programmers, developers, students, and educators seeking current research on the enhancement of user-centric information system

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development.

Discusses a comprehensive spectrum of software engineering techniques and shows how they can be applied in practical software projects. Programme examples in C++ and Ada have been removed from this sixth edition.

“Game Development: From Idea to Prototype” is a book that brings together several articles written by those who are engaged in the field of gaming technology, especially in the development of game applications or in the areas of research related to games. Each chapter in this book is written in order of content so that it is easy to understand. This book is a great reference and read for anyone interested in the game technology world. By emphasizing the theory and conceptual game development process, clear and detailed explanations are very helpful and informative to readers. It is hoped that this book will be useful in disseminating knowledge as well as a guide to readers .

Mathematical models have become invaluable tools for understanding the intricate dynamic behavior of complex biochemical and biological systems. Among computational strategies, logical modeling has been recently gaining interest as an alternative approach to address network dynamics. Due to its advantages, including scalability and independence of kinetic parameters, the logical modeling framework is becoming increasingly popular to study the dynamics of highly interconnected systems, such as cell cycle progression, T cell differentiation and gene regulation. Novel tools and standards have been developed to increase the

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interoperability of logical models, which can now be employ to respond a variety of biological questions. This Research Topic brings together the most recent and cutting-edge approaches in the area of logical modeling including, among others, novel biological applications, software development and model analysis techniques.

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