Top 100 Bestseller in Computer Science
Spring 2016
Outlier Analysis

With the increasing advances in hardware technology for data collection, and advances in software technology (databases) for data organization, computer scientists have increasingly participated in the latest advancements of the outlier analysis field. Computer scientists, specifically, approach this field based on their practical experiences in managing large amounts of data, and with far fewer assumptions—the data can be of any type, structured or unstructured, and may be extremely large. Outlier Analysis is a comprehensive exposition, as understood by data mining experts, statisticians and computer scientists. The book has been organized carefully, and emphasis was placed on[...]


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Biometrics in the New World
The Cloud, Mobile Technology and Pervasive Identity

This book takes a fresh look at biometrics and identity management, extending the dialogue beyond technical considerations, and exploring some of the broader societal and philosophical aspects surrounding the use of biometric applications. Features: presents a brief history of the development of biometrics, and describes some of the popularly held misconceptions surrounding the technology; investigates the challenges and possibilities of biometrics across third party infrastructures and on mobile computing devices; provides guidance on biometric systems design; explores the mechanisms necessary to enable identity intelligence, including logging mechanisms, data communications and data[...]

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The Textbook

This textbook explores the different aspects of data mining from the fundamentals to the complex data types and their applications, capturing the wide diversity of problem domains for data mining issues. It goes beyond the traditional focus on data mining problems to introduce advanced data types such as text, time series, discrete sequences, spatial data, graph data, and social networks. Until now, no single book has addressed all these topics in a comprehensive and integrated way. The chapters of this book fall into one of three categories: Fundamental chapters: Data mining has four main problems, which correspond to clustering, classification, association pattern mining, and[...]

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A Hands-on Approach

This book explores fundamental principles for securing IT systems and illustrates them with hands-on experiments that may be carried out by the reader using accompanying software. The experiments highlight key information security problems that arise in modern operating systems, networks, and web applications. The authors explain how to identify and exploit such problems and they show different countermeasures and their implementation. The reader thus gains a detailed understanding of how vulnerabilities arise and practical experience tackling them. After presenting the basics of security princi-
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Pattern recognition has its origins in engineering, whereas machine learning grew out of computer science. However, these activities can be viewed as two facets of the same field, and together they have undergone substantial development over the past ten years. In particular, Bayesian methods have grown from a specialist niche to become mainstream, while graphical models have emerged as a general framework for describing and applying probabilistic models. Also, the practical applicability of Bayesian methods has been greatly enhanced through the development of a range of approximate inference algorithms such as variational Bayes and expectation propagation. Similarly, new models based[...]

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This book describes the key concepts, principles and implementation options for creating high-assurance cloud computing solutions. The guide starts with a broad technical overview and basic introduction to cloud computing, looking at the overall architecture of the cloud, client systems, the modern Internet and cloud computing data centers. It then delves into the core challenges of showing how reliability and fault-tolerance can be abstracted, how the resulting questions can be solved, and how the solutions can be leveraged to create a wide range of practical cloud applications. The author’s style is practical, and the guide should be readily understandable without any special[...] More on www.springer.com/978-1-4471-2415-3

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Social Learning Systems and Communities of Practice is a collection of classical and contemporary writing associated with learning and systemic change in contexts ranging from cities, to rural development to education to nursing to water management to public policy. It is likely to be of interest to anyone trying to understand how to think systemically and to act and interact effectively in situations experienced as complex, messy and changing. While mainly concerned with professional praxis, where theory and practice inform each other, there is much here that can apply at a personal level. This book offers conceptual tools and suggestions for new ways of being and acting in the world[...]

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The EyeBot controller and mobile robots have evolved over more than a decade. This book gives an in-depth introduction to embedded systems and autonomous mobile robots, using the EyeBot controller (EyeCon) and the EyeBot mobile robot family as application examples. This book combines teaching and research material and can be used for courses in Embedded Systems as well as in Robotics and Automation. We see labs as an essential teaching and learning method in this area and encourage everybody to reprogram and rediscover the algorithms and systems presented in this book. Although we like simulations for many [...] More on www.springer.com/978-3-540-70533-8

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W. Burger, M.J. Burge

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Introduction to Reliable and Secure Distributed Programming

C. Cachin, R. Guerraoui, L. Rodrigues

In modern computing a program is usually distributed among several processes. The fundamental challenge when developing reliable and secure distributed programs is to support the cooperation of processes required to execute a common task, even when some of these processes fail. Failures may range from crashes to adversarial attacks by malicious processes. Cachin, Guerraoui, and Rodrigues present an introductory description of fundamental distributed programming abstractions together with algorithms to implement them in distributed systems, where processes are subject to crashes and malicious attacks. The authors follow an incremental approach by first introducing basic abstractions in [...] More on www.springer.com/978-3-642-15259-7

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P. Christen

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Originally published in 1981, this was the first textbook on programming in the Prolog language and is still the definitive introductory text on Prolog. Though many Prolog textbooks have been published since, this one has withstood the test of time because of its comprehensiveness, tutorial approach, and emphasis on general programming applications. Prolog has continued to attract a great deal of interest in the computer science community, and has turned out to be a basis for an important new generation of programming languages and systems for Artificial Intelligence. Since the previous edition of Programming in Prolog, the language has been standardised by the International[...]

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This comprehensive textbook presents a clean and coherent account of most fundamental tools and techniques in Parameterized Algorithms and is a self-contained guide to the area. The book covers many of the recent developments of the field, including application of important separators, branching based on linear programming, Cut & Count to obtain faster algorithms on tree decompositions, algorithms based on representative families of matroids, and use of the Strong Exponential Time Hypothesis. A number of older results are revisited and explained in a modern and didactic way. The book provides a toolbox of algorithmic techniques. Part I is an overview of basic techniques, each chapter[...]

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H. Delfs, H. Knebl

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The first part of this book covers the key concepts of cryptography on an undergraduate level, from encryption and digital signatures to cryptographic protocols. Essential techniques are demonstrated in protocols for key exchange, user identification, electronic elections and digital cash. In the second part, more advanced topics are addressed, such as the bit security of one-way functions and computationally perfect pseudorandom bit generators. The security of cryptographic schemes is a central topic. Typical examples of provably secure encryption and signature schemes and their security proofs are given. Though particular attention is given to the mathematical foundations, no ...
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During the past decade there has been an explosion in computation and information technology. With it have come vast amounts of data in a variety of fields such as medicine, biology, finance, and marketing. The challenge of understanding these data has led to the development of new tools in the field of statistics, and spawned new areas such as data mining, machine learning, and bioinformatics. Many of these tools have common underpinnings but are often expressed with different terminology. This book describes the important ideas in these areas in a common conceptual framework. While the approach is statistical, the emphasis is on concepts rather than mathematics. Many examples are[...]

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One chapter is dedicated to the popular genetic algorithms.

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