Data Mining Foundations And Practice 1st Edition

#data mining foundations and practice #data mining principles #practical data mining techniques #data analysis and discovery #machine learning for data mining

Explore the essential data mining foundations and practice with this comprehensive overview. Delve into core data mining principles and learn practical data mining techniques for real-world applications. This resource is designed to guide learners through the complexities of data analysis and discovery, making intricate concepts accessible and actionable.

Data Mining: Foundations and Practice

The IEEE ICDM 2004 workshop on the Foundation of Data Mining and the IEEE ICDM 2005 workshop on the Foundation of Semantic Oriented Data and Web Mining focused on topics ranging from the foundations of data mining to new data mining paradigms. The workshops brought together both data mining researchers and practitioners to discuss these two topics while seeking solutions to long standing data mining problems and stimul- ing new data mining research directions. We feel that the papers presented at these workshops may encourage the study of data mining as a scienti?c ?eld and spark new communications and collaborations between researchers and practitioners. Toexpressthevi- sionsforgedintheworkshopstoawiderangeofdatam- ing researchers and practitioners and foster active participation in the study of foundations of data mining, we edited this volume by involving extended and updated versions of selected papers presented at those workshops as well as some other relevant contributions. The content of this book includes st- ies of foundations of data mining from theoretical, practical, algorithmical, and managerial perspectives. The following is a brief summary of the papers contained in this book.

Data Mining: Concepts and Techniques

Data Mining: Concepts and Techniques provides the concepts and techniques in processing gathered data or information, which will be used in various applications. Specifically, it explains data mining and the tools used in discovering knowledge from the collected data. This book is referred as the knowledge discovery from data (KDD). It focuses on the feasibility, usefulness, effectiveness, and scalability of techniques of large data sets. After describing data mining, this edition explains the methods of knowing, preprocessing, processing, and warehousing data. It then presents information about data warehouses, online analytical processing (OLAP), and data cube technology. Then, the

methods involved in mining frequent patterns, associations, and correlations for large data sets are described. The book details the methods for data classification and introduces the concepts and methods for data clustering. The remaining chapters discuss the outlier detection and the trends, applications, and research frontiers in data mining. This book is intended for Computer Science students, application developers, business professionals, and researchers who seek information on data mining. Presents dozens of algorithms and implementation examples, all in pseudo-code and suitable for use in real-world, large-scale data mining projects Addresses advanced topics such as mining object-relational databases, spatial databases, multimedia databases, time-series databases, text databases, the World Wide Web, and applications in several fields Provides a comprehensive, practical look at the concepts and techniques you need to get the most out of your data

Practical Data Mining

Used by corporations, industry, and government to inform and fuel everything from focused advertising to homeland security, data mining can be a very useful tool across a wide range of applications. Unfortunately, most books on the subject are designed for the computer scientist and statistical illuminati and leave the reader largely adrift in tech

Web Data Mining

Liu has written a comprehensive text on Web mining, which consists of two parts. The first part covers the data mining and machine learning foundations, where all the essential concepts and algorithms of data mining and machine learning are presented. The second part covers the key topics of Web mining, where Web crawling, search, social network analysis, structured data extraction, information integration, opinion mining and sentiment analysis, Web usage mining, query log mining, computational advertising, and recommender systems are all treated both in breadth and in depth. His book thus brings all the related concepts and algorithms together to form an authoritative and coherent text. The book offers a rich blend of theory and practice. It is suitable for students, researchers and practitioners interested in Web mining and data mining both as a learning text and as a reference book. Professors can readily use it for classes on data mining, Web mining, and text mining. Additional teaching materials such as lecture slides, datasets, and implemented algorithms are available online.

Next Generation of Data Mining

Drawn from the US National Science Foundation’s Symposium on Next Generation of Data Mining and Cyber-Enabled Discovery for Innovation (NGDM 07), Next Generation of Data Mining explores emerging technologies and applications in data mining as well as potential challenges faced by the field. Gathering perspectives from top experts across different disciplines, the book debates upcoming challenges and outlines computational methods. The contributors look at how ecology, astronomy, social science, medicine, finance, and more can benefit from the next generation of data mining techniques. They examine the algorithms, middleware, infrastructure, and privacy policies associated with ubiquitous, distributed, and high performance data mining. They also discuss the impact of new technologies, such as the semantic web, on data mining and provide recommendations for privacy-preserving mechanisms. The dramatic increase in the availability of massive, complex data from various sources is creating computing, storage, communication, and human-computer interaction challenges for data mining. Providing a framework to better understand these fundamental issues, this volume surveys promising approaches to data mining problems that span an array of disciplines.

Data Mining

Data Mining: Practical Machine Learning Tools and Techniques, Third Edition, offers a thorough grounding in machine learning concepts as well as practical advice on applying machine learning tools and techniques in real-world data mining situations. This highly anticipated third edition of the most acclaimed work on data mining and machine learning will teach you everything you need to know about preparing inputs, interpreting outputs, evaluating results, and the algorithmic methods at the heart of successful data mining. Thorough updates reflect the technical changes and modernizations that have taken place in the field since the last edition, including new material on Data Transformations, Ensemble Learning, Massive Data Sets, Multi-instance Learning, plus a new version of the popular Weka machine learning software developed by the authors. Witten, Frank, and Hall include both tried-and-true techniques of today as well as methods at the leading edge of contemporary research. The book is targeted at information systems practitioners, programmers, consultants, developers,

information technology managers, specification writers, data analysts, data modelers, database R&D professionals, data warehouse engineers, data mining professionals. The book will also be useful for professors and students of upper-level undergraduate and graduate-level data mining and machine learning courses who want to incorporate data mining as part of their data management knowledge base and expertise. Provides a thorough grounding in machine learning concepts as well as practical advice on applying the tools and techniques to your data mining projects Offers concrete tips and techniques for performance improvement that work by transforming the input or output in machine learning methods Includes downloadable Weka software toolkit, a collection of machine learning algorithms for data mining tasks—in an updated, interactive interface. Algorithms in toolkit cover: data pre-processing, classification, regression, clustering, association rules, visualization

Data Mining: Know It All

This book brings all of the elements of data mining together in a single volume, saving the reader the time and expense of making multiple purchases. It consolidates both introductory and advanced topics, thereby covering the gamut of data mining and machine learning tactics ? from data integration and pre-processing, to fundamental algorithms, to optimization techniques and web mining methodology. The proposed book expertly combines the finest data mining material from the Morgan Kaufmann portfolio. Individual chapters are derived from a select group of MK books authored by the best and brightest in the field. These chapters are combined into one comprehensive volume in a way that allows it to be used as a reference work for those interested in new and developing aspects of data mining. This book represents a quick and efficient way to unite valuable content from leading data mining experts, thereby creating a definitive, one-stop-shopping opportunity for customers to receive the information they would otherwise need to round up from separate sources. Chapters contributed by various recognized experts in the field let the reader remain up to date and fully informed from multiple viewpoints. Presents multiple methods of analysis and algorithmic problem-solving techniques, enhancing the reader’s technical expertise and ability to implement practical solutions. Coverage of both theory and practice brings all of the elements of data mining together in a single volume, saving the reader the time and expense of making multiple purchases.

Data Mining and Analysis

A comprehensive overview of data mining from an algorithmic perspective, integrating related concepts from machine learning and statistics.

Social and Political Implications of Data Mining: Knowledge Management in E-Government

"This book focuses on the data mining and knowledge management implications that lie within online government"--Provided by publisher.

Spectral Feature Selection for Data Mining (Open Access)

Spectral Feature Selection for Data Mining introduces a novel feature selection technique that establishes a general platform for studying existing feature selection algorithms and developing new algorithms for emerging problems in real-world applications. This technique represents a unified framework for supervised, unsupervised, and semisupervise

Applied Data Mining

Data mining has witnessed substantial advances in recent decades. New research questions and practical challenges have arisen from emerging areas and applications within the various fields closely related to human daily life, e.g. social media and social networking. This book aims to bridge the gap between traditional data mining and the latest advances in newly emerging information services. It explores the extension of well-studied algorithms and approaches into these new research arenas.

The Management of Consumer Credit

This book explains how financial institutions, such as banks and finance houses, manage their portfolios of credit cards, loans, mortgages and other types of retail credit agreements. The second edition has been substantially updated, with new chapters on capital requirements, Basel II, scorecard and portfolio monitoring.

Data Preparation for Data Mining

This book focuses on the importance of clean, well-structured data as the first step to successful data mining. It shows how data should be prepared prior to mining in order to maximize mining performance.

Correlation Clustering

Given a set of objects and a pairwise similarity measure between them, the goal of correlation clustering is to partition the objects in a set of clusters to maximize the similarity of the objects within the same cluster and minimize the similarity of the objects in different clusters. In most of the variants of correlation clustering, the number of clusters is not a given parameter; instead, the optimal number of clusters is automatically determined. Correlation clustering is perhaps the most natural formulation of clustering: as it just needs a definition of similarity, its broad generality makes it applicable to a wide range of problems in different contexts, and, particularly, makes it naturally suitable to clustering structured objects for which feature vectors can be difficult to obtain. Despite its simplicity, generality, and wide applicability, correlation clustering has so far received much more attention from an algorithmic-theory perspective than from the data-mining community. The goal of this lecture is to show how correlation clustering can be a powerful addition to the toolkit of a data-mining researcher and practitioner, and to encourage further research in the area.

Mining of Massive Datasets

Now in its second edition, this book focuses on practical algorithms for mining data from even the largest datasets.

Principles of Data Mining

This book explains and explores the principal techniques of Data Mining, the automatic extraction of implicit and potentially useful information from data, which is increasingly used in commercial, scientific and other application areas. It focuses on classification, association rule mining and clustering. Each topic is clearly explained, with a focus on algorithms not mathematical formalism, and is illustrated by detailed worked examples. The book is written for readers without a strong background in mathematics or statistics and any formulae used are explained in detail. It can be used as a textbook to support courses at undergraduate or postgraduate levels in a wide range of subjects including Computer Science, Business Studies, Marketing, Artificial Intelligence, Bioinformatics and Forensic Science. As an aid to self study, this book aims to help general readers develop the necessary understanding of what is inside the 'black box' so they can use commercial data mining packages discriminatingly, as well as enabling advanced readers or academic researchers to understand or contribute to future technical advances in the field. Each chapter has practical exercises to enable readers to check their progress. A full glossary of technical terms used is included. This expanded third edition includes detailed descriptions of algorithms for classifying streaming data, both stationary data, where the underlying model is fixed, and data that is time-dependent, where the underlying model changes from time to time - a phenomenon known as concept drift.

Principles of Data Mining

The first truly interdisciplinary text on data mining, blending the contributions of information science, computer science, and statistics. The growing interest in data mining is motivated by a common problem across disciplines: how does one store, access, model, and ultimately describe and understand very large data sets? Historically, different aspects of data mining have been addressed independently by different disciplines. This is the first truly interdisciplinary text on data mining, blending the contributions of information science, computer science, and statistics. The book consists of three sections. The first, foundations, provides a tutorial overview of the principles underlying data mining algorithms and their application. The presentation emphasizes intuition rather than rigor. The second section, data mining algorithms, shows how algorithms are constructed to solve specific problems in a principled manner. The algorithms covered include trees and rules for classification and regression, association rules, belief networks, classical statistical models, nonlinear models such as neural networks, and local "memory-based" models. The third section shows how all of the preceding analysis fits together when applied to real-world data mining problems. Topics include the role of metadata, how to handle missing data, and data preprocessing.

Foundations of Data Science

Covers mathematical and algorithmic foundations of data science: machine learning, high-dimensional geometry, and analysis of large networks.

Handbook of Statistical Analysis and Data Mining Applications

Handbook of Statistical Analysis and Data Mining Applications, Second Edition, is a comprehensive professional reference book that guides business analysts, scientists, engineers and researchers, both academic and industrial, through all stages of data analysis, model building and implementation. The handbook helps users discern technical and business problems, understand the strengths and weaknesses of modern data mining algorithms and employ the right statistical methods for practical application. This book is an ideal reference for users who want to address massive and complex datasets with novel statistical approaches and be able to objectively evaluate analyses and solutions. It has clear, intuitive explanations of the principles and tools for solving problems using modern analytic techniques and discusses their application to real problems in ways accessible and beneficial to practitioners across several areas—from science and engineering, to medicine, academia and commerce. Includes input by practitioners for practitioners Includes tutorials in numerous fields of study that provide step-by-step instruction on how to use supplied tools to build models Contains practical advice from successful real-world implementations Brings together, in a single resource, all the information a beginner needs to understand the tools and issues in data mining to build successful data mining solutions Features clear, intuitive explanations of novel analytical tools and techniques, and their practical applications

Data Smart

Data Science gets thrown around in the press like it'smagic. Major retailers are predicting everything from when theircustomers are pregnant to when they want a new pair of ChuckTaylors. It's a brave new world where seemingly meaningless datacan be transformed into valuable insight to drive smart businessdecisions. But how does one exactly do data science? Do you have to hireone of these priests of the dark arts, the "data scientist," toextract this gold from your data? Nope. Data science is little more than using straight-forward steps toprocess raw data into actionable insight. And in DataSmart, author and data scientist John Foreman will show you howthat's done within the familiar environment of aspreadsheet. Why a spreadsheet? It's comfortable! You get to look at the dataevery step of the way, building confidence as you learn the tricksof the trade. Plus, spreadsheets are a vendor-neutral place tolearn data science without the hype. But don't let the Excel sheets fool you. This is a book forthose serious about learning the analytic techniques, the math andthe magic, behind big data. Each chapter will cover a different technique in aspreadsheet so you can follow along: Mathematical optimization, including non-linear programming andgenetic algorithms Clustering via k-means, spherical k-means, and graphmodularity Data mining in graphs, such as outlier detection Supervised AI through logistic regression, ensemble models, andbag-of-words models Forecasting, seasonal adjustments, and prediction intervalsthrough monte carlo simulation Moving from spreadsheets into the R programming language You get your hands dirty as you work alongside John through eachtechnique. But never fear, the topics are readily applicable andthe author laces humor throughout. You'll even learnwhat a dead squirrel has to do with optimization modeling, whichyou no doubt are dying to know.

New Fundamental Technologies in Data Mining

The progress of data mining technology and large public popularity establish a need for a comprehensive text on the subject. The series of books entitled by "Data Mining" address the need by presenting in-depth description of novel mining algorithms and many useful applications. In addition to understanding each section deeply, the two books present useful hints and strategies to solving problems in the following chapters. The contributing authors have highlighted many future research directions that will foster multi-disciplinary collaborations and hence will lead to significant development in the field of data mining.

Advancing into Analytics

Data analytics may seem daunting, but if you're an experienced Excel user, you have a unique head start. With this hands-on guide, intermediate Excel users will gain a solid understanding of analytics and the data stack. By the time you complete this book, you'll be able to conduct exploratory data

analysis and hypothesis testing using a programming language. Exploring and testing relationships are core to analytics. By using the tools and frameworks in this book, you'll be well positioned to continue learning more advanced data analysis techniques. Author George Mount, founder and CEO of Stringfest Analytics, demonstrates key statistical concepts with spreadsheets, then pivots your existing knowledge about data manipulation into R and Python programming. This practical book guides you through: Foundations of analytics in Excel: Use Excel to test relationships between variables and build compelling demonstrations of important concepts in statistics and analytics From Excel to R: Cleanly transfer what you've learned about working with data from Excel to R From Excel to Python: Learn how to pivot your Excel data chops into Python and conduct a complete data analysis

Practical Graph Mining with R

Discover Novel and Insightful Knowledge from Data Represented as a GraphPractical Graph Mining with R presents a "do-it-yourself" approach to extracting interesting patterns from graph data. It covers many basic and advanced techniques for the identification of anomalous or frequently recurring patterns in a graph, the discovery of groups or cluste

Data Mining and Data Warehousing

Provides a comprehensive textbook covering theory and practical examples for a course on data mining and data warehousing.

Data Mining Techniques

Many companies have invested in building large databases and data warehouses capable of storing vast amounts of information. This book offers business, sales and marketing managers a practical guide to accessing such information.

Data Science Foundations

"Data Science Foundations is most welcome and, indeed, a piece of literature that the field is very much in need of...quite different from most data analytics texts which largely ignore foundational concepts and simply present a cookbook of methods...a very useful text and I would certainly use it in my teaching." - Mark Girolami, Warwick University Data Science encompasses the traditional disciplines of mathematics, statistics, data analysis, machine learning, and pattern recognition. This book is designed to provide a new framework for Data Science, based on a solid foundation in mathematics and computational science. It is written in an accessible style, for readers who are engaged with the subject but not necessarily experts in all aspects. It includes a wide range of case studies from diverse fields, and seeks to inspire and motivate the reader with respect to data, associated information, and derived knowledge.

Data Mining Techniques in CRM

This is an applied handbook for the application of data mining techniques in the CRM framework. It combines a technical and a business perspective to cover the needs of business users who are looking for a practical guide on data mining. It focuses on Customer Segmentation and presents guidelines for the development of actionable segmentation schemes. By using non-technical language it guides readers through all the phases of the data mining process.

Correlation Clustering

Given a set of objects and a pairwise similarity measure between them, the goal of correlation clustering is to partition the objects in a set of clusters to maximize the similarity of the objects within the same cluster and minimize the similarity of the objects in different clusters. In most of the variants of correlation clustering, the number of clusters is not a given parameter; instead, the optimal number of clusters is automatically determined. Correlation clustering is perhaps the most natural formulation of clustering: as it just needs a definition of similarity, its broad generality makes it applicable to a wide range of problems in different contexts, and, particularly, makes it naturally suitable to clustering structured objects for which feature vectors can be difficult to obtain. Despite its simplicity, generality, and wide applicability, correlation clustering has so far received much more attention from an algorithmic-theory perspective than from the data-mining community. The goal of this lecture is to show how correlation

clustering can be a powerful addition to the toolkit of a data-mining researcher and practitioner, and to encourage further research in the area.

Data Mining Cookbook

Increase profits and reduce costs by utilizing this collection of models of the most commonly asked data mining questions In order to find new ways to improve customer sales and support, and as well as manage risk, business managers must be able to mine company databases. This book provides a step-by-step guide to creating and implementing models of the most commonly asked data mining questions. Readers will learn how to prepare data to mine, and develop accurate data mining questions. The author, who has over ten years of data mining experience, also provides actual tested models of specific data mining questions for marketing, sales, customer service and retention, and risk management. A CD-ROM, sold separately, provides these models for reader use.

Theory and Practice of Business Intelligence in Healthcare

Business intelligence supports managers in enterprises to make informed business decisions in various levels and domains such as in healthcare. These technologies can handle large structured and un-structured data (big data) in the healthcare industry. Because of the complex nature of healthcare data and the significant impact of healthcare data analysis, it is important to understand both the theories and practices of business intelligence in healthcare. Theory and Practice of Business Intelligence in Healthcare is a collection of innovative research that introduces data mining, modeling, and analytic techniques to health and healthcare data; articulates the value of big volumes of data to health and healthcare; evaluates business intelligence tools; and explores business intelligence use and applications in healthcare. While highlighting topics including digital health, operations intelligence, and patient empowerment, this book is ideally designed for healthcare professionals, IT consultants, hospital directors, data management staff, data analysts, hospital administrators, executives, managers, academicians, students, and researchers seeking current research on the digitization of health records and health systems integration.

Practical Data Mining

Used by corporations, industry, and government to inform and fuel everything from focused advertising to homeland security, data mining can be a very useful tool across a wide range of applications. Unfortunately, most books on the subject are designed for the computer scientist and statistical illuminati and leave the reader largely adrift in technical waters. Revealing the lessons known to the seasoned expert, yet rarely written down for the uninitiated, Practical Data Mining explains the ins-and-outs of the detection, characterization, and exploitation of actionable patterns in data. This working field manual outlines the what, when, why, and how of data mining and offers an easy-to-follow, six-step spiral process. Catering to IT consultants, professional data analysts, and sophisticated data owners, this systematic, yet informal treatment will help readers answer questions, such as: What process model should I use to plan and execute a data mining project? How is a quantitative business case developed and assessed? What are the skills needed for different data mining projects? How do I track and evaluate data mining projects? How do I choose the best data mining techniques? Helping you avoid common mistakes, the book describes specific genres of data mining practice. Most chapters contain one or more case studies with detailed projects descriptions, methods used, challenges encountered, and results obtained. The book includes working checklists for each phase of the data mining process. Your passport to successful technical and planning discussions with management, senior scientists, and customers, these checklists lay out the right questions to ask and the right points to make from an insider’s point of view. Visit the book’s webpage for access to additional resources—including checklists, figures, PowerPoint slides, and a small set of simple prototype data mining tools. http://www.celestech.com/PracticalDataMining

Practical Graph Mining with R

Discover Novel and Insightful Knowledge from Data Represented as a Graph Practical Graph Mining with R presents a "do-it-yourself" approach to extracting interesting patterns from graph data. It covers many basic and advanced techniques for the identification of anomalous or frequently recurring patterns in a graph, the discovery of groups or clusters of nodes that share common patterns of attributes and relationships, the extraction of patterns that distinguish one category of graphs from another, and the use of those patterns to predict the category of new graphs. Hands-On Application of

Graph Data Mining Each chapter in the book focuses on a graph mining task, such as link analysis, cluster analysis, and classification. Through applications using real data sets, the book demonstrates how computational techniques can help solve real-world problems. The applications covered include network intrusion detection, tumor cell diagnostics, face recognition, predictive toxicology, mining metabolic and protein-protein interaction networks, and community detection in social networks. Develops Intuition through Easy-to-Follow Examples and Rigorous Mathematical Foundations Every algorithm and example is accompanied with R code. This allows readers to see how the algorithmic techniques correspond to the process of graph data analysis and to use the graph mining techniques in practice. The text also gives a rigorous, formal explanation of the underlying mathematics of each technique. Makes Graph Mining Accessible to Various Levels of Expertise Assuming no prior knowledge of mathematics or data mining, this self-contained book is accessible to students, researchers, and practitioners of graph data mining. It is suitable as a primary textbook for graph mining or as a supplement to a standard data mining course. It can also be used as a reference for researchers in computer, information, and computational science as well as a handy guide for data analytics practitioners.

Foundations and Practice of Security

This book constitutes the thoroughly refereed post-conference proceedings of the 9th International Symposium on Foundations and Practice of Security, FPS 2016, held in Québec City, QC, Canada, in October 2016. The 18 revised regular papers presented together with 5 short papers and 3 invited talks were carefully reviewed and selected from 34 submissions. The accepted papers cover diverse research themes, ranging from classic topics, such as malware, anomaly detection, and privacy, to emerging issues, such as security and privacy in mobile computing and cloud.

Heterogeneous Objects Modelling and Applications

Heterogeneous object modelling is a new and quickly developing research area. This book is one of the first attempts to systematically cover the most relevant themes and problems of this new and challenging subject area. It is a collection of invited papers and papers co-authored by the editors. Each chapter presents either new research results or a survey on the following topics: Formal models and abstractions of heterogeneous objects including geometric, topological, discrete and continuous models, operations forming special algebras and conversions between different model types. Data structures and algorithms for representing, modifying and computing with heterogeneous objects. Computational techniques for the design, reconstruction, optimization, analysis and simulation of heterogeneous objects that incorporate information on shape, material and physical behavior using a common framework. Applications of heterogeneous object modelling in engineering and scientific areas, including geophysical, biomedical, artistic and multi-material fabrication applications.

Practical Text Mining and Statistical Analysis for Non-structured Text Data Applications

The world contains an unimaginably vast amount of digital information which is getting ever vaster ever more rapidly. This makes it possible to do many things that previously could not be done: spot business trends, prevent diseases, combat crime and so on. Managed well, the textual data can be used to unlock new sources of economic value, provide fresh insights into science and hold governments to account. As the Internet expands and our natural capacity to process the unstructured text that it contains diminishes, the value of text mining for information retrieval and search will increase dramatically. This comprehensive professional reference brings together all the information, tools and methods a professional will need to efficiently use text mining applications and statistical analysis. The Handbook of Practical Text Mining and Statistical Analysis for Non-structured Text Data Applications presents a comprehensive how- to reference that shows the user how to conduct text mining and statistically analyze results. In addition to providing an in-depth examination of core text mining and link detection tools, methods and operations, the book examines advanced preprocessing techniques, knowledge representation considerations, and visualization approaches. Finally, the book explores current real-world, mission-critical applications of text mining and link detection using real world example tutorials in such varied fields as corporate, finance, business intelligence, genomics research, and counterterrorism activities. -Extensive case studies, most in a tutorial format, allow the reader to 'click through' the example using a software program, thus learning to conduct text mining analyses in the most rapid manner of learning possible -Numerous examples, tutorials, power points

and datasets available via companion website on Elsevierdirect.com -Glossary of text mining terms provided in the appendix

Foundations of Deep Reinforcement Learning

The Contemporary Introduction to Deep Reinforcement Learning that Combines Theory and Practice Deep reinforcement learning (deep RL) combines deep learning and reinforcement learning, in which artificial agents learn to solve sequential decision-making problems. In the past decade deep RL has achieved remarkable results on a range of problems, from single and multiplayer games--such as Go, Atari games, and DotA 2--to robotics. Foundations of Deep Reinforcement Learning is an introduction to deep RL that uniquely combines both theory and implementation. It starts with intuition, then carefully explains the theory of deep RL algorithms, discusses implementations in its companion software library SLM Lab, and finishes with the practical details of getting deep RL to work. Understand each key aspect of a deep RL problem Explore policy- and value-based algorithms, including REINFORCE, SARSA, DQN, Double DQN, and Prioritized Experience Replay (PER) Delve into combined algorithms, including Actor-Critic and Proximal Policy Optimization (PPO) Understand how algorithms can be parallelized synchronously and asynchronously Run algorithms in SLM Lab and learn the practical implementation details for getting deep RL to work Explore algorithm benchmark results with tuned hyperparameters Understand how deep RL environments are designed This guide is ideal for both computer science students and software engineers who are familiar with basic machine learning concepts and have a working understanding of Python.

Data Mining and Machine Learning in Cybersecurity

With the rapid advancement of information discovery techniques, machine learning and data mining continue to play a significant role in cybersecurity. Although several conferences, workshops, and journals focus on the fragmented research topics in this area, there has been no single interdisciplinary resource on past and current works and possible

Principles and Practice of Big Data

Principles and Practice of Big Data: Preparing, Sharing, and Analyzing Complex Information, Second Edition updates and expands on the first edition, bringing a set of techniques and algorithms that are tailored to Big Data projects. The book stresses the point that most data analyses conducted on large, complex data sets can be achieved without the use of specialized suites of software (e.g., Hadoop), and without expensive hardware (e.g., supercomputers). The core of every algorithm described in the book can be implemented in a few lines of code using just about any popular programming language (Python snippets are provided). Through the use of new multiple examples, this edition demonstrates that if we understand our data, and if we know how to ask the right questions, we can learn a great deal from large and complex data collections. The book will assist students and professionals from all scientific backgrounds who are interested in stepping outside the traditional boundaries of their chosen academic disciplines. Presents new methodologies that are widely applicable to just about any project involving large and complex datasets Offers readers informative new case studies across a range scientific and engineering disciplines Provides insights into semantics, identification, de-identification, vulnerabilities and regulatory/legal issues Utilizes a combination of pseudocode and very short snippets of Python code to show readers how they may develop their own projects without downloading or learning new software

Mining Graph Data

This text takes a focused and comprehensive look at mining data represented as a graph, with the latest findings and applications in both theory and practice provided. Even if you have minimal background in analyzing graph data, with this book you'll be able to represent data as graphs, extract patterns and concepts from the data, and apply the methodologies presented in the text to real datasets. There is a misprint with the link to the accompanying Web page for this book. For those readers who would like to experiment with the techniques found in this book or test their own ideas on graph data, the Web page for the book should be http://www.eecs.wsu.edu/MGD.

Foundations and Advances in Data Mining

With the growing use of information technology and the recent advances in web systems, the amount of data available to users has increased exponentially. Thus, there is a critical need to understand the content of the data. As a result, data-mining has become a popular research topic in recent years for the treatment of the "data rich and information poor" syndrome. In this carefully edited volume a theoretical foundation as well as important new directions for data-mining research are presented. It brings together a set of well respected data mining theoreticians and researchers with practical data mining experiences. The presented theories will give data mining practitioners a scientific perspective in data mining and thus provide more insight into their problems, and the provided new data mining topics can be expected to stimulate further research in these important directions.

Feature Extraction

This book is both a reference for engineers and scientists and a teaching resource, featuring tutorial chapters and research papers on feature extraction. Until now there has been insufficient consider-ation of feature selection algorithms, no unified presentation of leading methods, and no systematic comparisons.

Image Feature Detectors and Descriptors

This book provides readers with a selection of high-quality chapters that cover both theoretical concepts and practical applications of image feature detectors and descriptors. It serves as reference for researchers and practitioners by featuring survey chapters and research contributions on image feature detectors and descriptors. Additionally, it emphasizes several keywords in both theoretical and practical aspects of image feature extraction. The keywords include acceleration of feature detection and extraction, hardware implantations, image segmentation, evolutionary algorithm, ordinal measures, as well as visual speech recognition.

The Art of Feature Engineering

A practical guide for data scientists who want to improve the performance of any machine learning solution with feature engineering.

Structural, Syntactic, and Statistical Pattern Recognition

This book constitutes the proceedings of the Joint IAPR International Workshop on Structural, Syntactic, and Statistical Pattern Recognition, S+SSPR 2014; comprising the International Workshop on Structural and Syntactic Pattern Recognition, SSPR, and the International Workshop on Statistical Techniques in Pattern Recognition, SPR. The total of 25 full papers and 22 poster papers included in this book were carefully reviewed and selected from 78 submissions. They are organized in topical sections named: graph kernels; clustering; graph edit distance; graph models and embedding; discriminant analysis; combining and selecting; joint session; metrics and dissimilarities; applications; partial supervision; and poster session.

Rough Sets, Fuzzy Sets, Data Mining, and Granular Computing

This book constitutes the refereed conference proceedings of the 15th International Conference on Rough Sets, Fuzzy Sets, Data Mining and Granular Computing, RSFDGrC 2015, held in Tianjin, China in November 2015 as one of the co-located conference of the 2015 Joint Rough Set Symposium, JRS 2015. The 44 papers were carefully reviewed and selected from 97 submissions. The papers in this volume cover topics such as rough sets: the experts speak; generalized rough sets; rough sets and graphs; rough and fuzzy hybridization; granular computing; data mining and machine learning; three-way decisions; IJCRS 2015 data challenge.

Feature Extraction and Classification in Context of Machine Learning

Research and development over the past decades have led to significant advances in the field of Pattern Recognition. A textbook covering the basics of attributes and feature selection is the need of the day. The author has made a sincere attempt to meet these requirements.The various concepts of the subject are arranged logically and explained in a simple reader-friendly language. For a proper under-standing of the subject, a large number of examples with their step-by-step solutions are provided for every concept. Illustrative examples are discussed to emphasize conceptual clarity, thereby presenting

typical applications. Highlight extraction, or dimensionality decrease, is a fundamental piece of many AI applications. The need for highlight extraction originates from the source of dimensionality and the high computational expense of controlling high-layered information. In this theory, we center around how to enhance extraction and arrangement of feature extraction. This highly encouraging impact of feature extraction motivated me to look into ways to write the book and create it for attribute selection.

Biosignal Processing and Classification Using Computational Learning and Intelligence

Biosignal Processing and Classification Using Computational Learning and Intelligence: Principles, Algorithms and Applications posits an approach for biosignal processing and classification using computational learning and intelligence, highlighting that the term biosignal refers to all kinds of signals that can be continuously measured and monitored in living beings. The book is composed of five relevant parts. Part One is an introduction to biosignals and Part Two describes the relevant techniques for biosignal processing, feature extraction and feature selection/dimensionality reduction. Part Three presents the fundamentals of computational learning (machine learning). Then, the main techniques of computational intelligence are described in Part Four. The authors focus primarily on the explanation of the most used methods in the last part of this book, which is the most extensive portion of the book. This part consists of a recapitulation of the newest applications and reviews in which these techniques have been successfully applied to the biosignals' domain, including EEG-based Brain-Computer Interfaces (BCI) focused on P300 and Imagined Speech, emotion recognition from voice and video, leukemia recognition, infant cry recognition, EEGbased ADHD identification among others. Provides coverage of the fundamentals of signal processing, including sensing the heart, sending the brain, sensing human acoustic, and sensing other organs Includes coverage biosignal pre-processing techniques such as filtering, artifiact removal, and feature extraction techniques such as Fourier transform, wavelet transform, and MFCC Covers the latest techniques in machine learning and computational intelligence, including Supervised Learning, common classifiers, feature selection, dimensionality reduction, fuzzy logic, neural networks, Deep Learning, bio-inspired algorithms, and Hybrid Systems Written by engineers to help engineers, computer scientists, researchers, and clinicians understand the technology and applications of computational learning to biosignal processing

Applications of Big Data and Artificial Intelligence in Smart Energy Systems

In the era of propelling traditional energy systems to evolve towards smart energy systems, including power generation, energy storage systems, and electricity consumption have become more dynamic. The quality and reliability of power supply are impacted by the sporadic and rising use of electric vehicles, domestic loads, and industrial loads. Similarly, with the integration of solid state devices, renewable sources, and distributed generation, power generation processes are evolving in a variety of ways. Several cutting-edge technologies are necessary for the safe and secure operation of power systems in such a dynamic setting, including load distribution, automation, energy regulation & control, and energy trading. This book covers the applications of various big data analytics,artificial intelligence, and machine learning technologies in smart grids for demand prediction, decision-making processes, policy, and energy management. The book delves into the new technologies for modern power systems such as the Internet of Things, Blockchain for smart home and smart city solutions in depth. Technical topics discussed in the book include: • Hybrid smart energy system technologies • Smart meters • Energy demand forecasting • Use of different protocols and communication in smart energy systems • Power quality and allied issues and mitigation using AI • Intelligent transportation • Virtual power plants • AI based smart energy business models • Smart home solutions • Blockchain solutions for smart grids.

Feature Extraction, Construction and Selection

There is broad interest in feature extraction, construction, and selection among practitioners from statistics, pattern recognition, and data mining to machine learning. Data preprocessing is an essential step in the knowledge discovery process for real-world applications. This book compiles contributions from many leading and active researchers in this growing field and paints a picture of the state-of-art techniques that can boost the capabilities of many existing data mining tools. The objective of this collection is to increase the awareness of the data mining community about the research of feature extraction, construction and selection, which are currently conducted mainly in isolation. This book is part of our endeavor to produce a contemporary overview of modern solutions, to create synergy among these seemingly different branches, and to pave the way for developing meta-systems and

novel approaches. Even with today's advanced computer technologies, discovering knowledge from data can still be fiendishly hard due to the characteristics of the computer generated data. Feature extraction, construction and selection are a set of techniques that transform and simplify data so as to make data mining tasks easier. Feature construction and selection can be viewed as two sides of the representation problem.

Advances in Selected Artificial Intelligence Areas

As new technological challenges are perpetually arising, Artificial Intelligence research interests are focusing on the incorporation of improvement abilities into machines in an effort to make them more efficient and more useful. Recent reports indicate that the demand for scientists with Artificial Intelligence skills significantly exceeds the market availability and that this shortage will intensify further in the years to come. A potential solution includes attracting more women into the field, as women currently make up only 26 percent of Artificial Intelligence positions in the workforce. The present book serves a dual purpose: On one hand, it sheds light on the very significant research led by women in areas of Artificial Intelligence, in hopes of inspiring other women to follow studies in the area and get involved in related research. On the other hand, it highlights the state-of-the-art and current research in selected Artificial Intelligence areas and applications. The book consists of an editorial note and an additional thirteen (13) chapters, all authored by invited women-researchers who work on various Artificial Intelligence areas and stand out for their significant research contributions. In more detail, the chapters in the book are organized into three parts, namely (i) Advances in Artificial Intelligence Paradigms, (ii) Advances in Artificial Intelligence Applications, and (iii) Recent Trends in Artificial Intelligence Areas and Applications. This research book is directed towards professors, researchers, scientists, engineers and students in Artificial Intelligence-related disciplines. It is also directed towards readers who come from other disciplines and are interested in becoming versed in some of the most recent Artificial Intelligence-based technologies. An extensive list of bibliographic references at the end of each chapter guides the readers to probe further into the Artificial Intelligence areas of interest to them.

Machine Learning Paradigms: Theory and Application

The book focuses on machine learning. Divided into three parts, the first part discusses the feature selection problem. The second part then describes the application of machine learning in the classification problem, while the third part presents an overview of real-world applications of swarm-based optimization algorithms. The concept of machine learning (ML) is not new in the field of computing. However, due to the ever-changing nature of requirements in today’s world it has emerged in the form of completely new avatars. Now everyone is talking about ML-based solution strategies for a given problem set. The book includes research articles and expository papers on the theory and algorithms of machine learning and bio-inspiring optimization, as well as papers on numerical experiments and real-world applications.

Rough Set and Knowledge Technology

This book constitutes the refereed proceedings of the 6th International Conference on Rough Sets and Knowledge Technology, RSKT 2011, held in Banff, Canada, in September 2011. The 89 revised full papers presented together with 3 keynote lectures and 1 invited tutorial session were carefully reviewed and selected from 229 submissions. The papers are organized in topical sections on attribute reduction and feature selection, generalized rough set models, machine learning with rough and hybrid techniques, knowledge technology and intelligent systems and applications.

The Semantic Web: Research and Applications

This book constitutes the refereed proceedings of the 9th Extended Semantic Web Conference, ESWC 2012, held in Heraklion, Crete, Greece, in May 2012. The 53 revised full papers presented were carefully reviewed and selected from 212 submissions. They are organized in tracks on linked open data, machine learning, natural language processing and information retrieval, ontologies, reasoning, semantic data management, services, processes, and cloud computing, social Web and Web science, in-use and industrial, digital libraries and cultural heritage, and e-government. The book also includes 13 PhD papers presented at the PhD Symposium.

Handbook of Research on Foundations and Applications of Intelligent Business Analytics

Intelligent business analytics is an emerging technology that has become a mainstream market adopted broadly across industries, organizations, and geographic regions. Intelligent business analytics is a current focus for research and development across academia and industries and must be examined and considered thoroughly so businesses can apply the technology appropriately. The Handbook of Research on Foundations and Applications of Intelligent Business Analytics examines the technologies and applications of intelligent business analytics and discusses the foundations of intelligent analytics such as intelligent mining, intelligent statistical modeling, and machine learning. Covering topics such as augmented analytics and artificial intelligence systems, this major reference work is ideal for scholars, engineers, professors, practitioners, researchers, industry professionals, academicians, and students.

Character Recognition Systems

"Much of pattern recognition theory and practice, including methods such as Support Vector Machines, has emerged in an attempt to solve the character recognition problem. This book is written by very well-known academics who have worked in the field for many years and have made significant and lasting contributions. The book will no doubt be of value to students and practitioners." -Sargur N. Srihari, SUNY Distinguished Professor, Department of Computer Science and Engineering, and Director, Center of Excellence for Document Analysis and Recognition (CEDAR), University at Buffalo, The State University of New York "The disciplines of optical character recognition and document image analysis have a history of more than forty years. In the last decade, the importance and popularity of these areas have grown enormously. Surprisingly, however, the field is not well covered by any textbook. This book has been written by prominent leaders in the field. It includes all important topics in optical character recognition and document analysis, and is written in a very coherent and comprehensive style. This book satisfies an urgent need. It is a volume the community has been awaiting for a long time, and I can enthusiastically recommend it to everybody working in the area." -Horst Bunke, Professor, Institute of Computer Science and Applied Mathematics (IAM), University of Bern, Switzerland In Character Recognition Systems, the authors provide practitioners and students with the fundamental principles and state-of-the-art computational methods of reading printed texts and handwritten materials. The information presented is analogous to the stages of a computer recognition system, helping readers master the theory and latest methodologies used in character recognition in a meaningful way. This book covers: * Perspectives on the history, applications, and evolution of Optical Character Recognition (OCR) * The most widely used pre-processing techniques, as well as methods for extracting character contours and skeletons * Evaluating extracted features, both structural and statistical * Modern classification methods that are successful in character recognition, including statistical methods, Artificial Neural Networks (ANN), Support Vector Machines (SVM), structural methods, and multi-classifier methods * An overview of word and string recognition methods and techniques * Case studies that illustrate practical applications, with descriptions of the methods and theories behind the experimental results Each chapter contains major steps and tricks to handle the tasks described at-hand. Researchers and graduate students in computer science and engineering will find this book useful for designing a concrete system in OCR technology, while practitioners will rely on it as a valuable resource for the latest advances and modern technologies that aren't covered elsewhere in a single book.

Algorithmic Learning Theory

This volume contains papers presented at the 19th International Conference on Algorithmic Learning Theory (ALT 2008), which was held in Budapest, Hungary during October 13–16, 2008. The conference was co-located with the 11th - ternational Conference on Discovery Science (DS 2008). The technical program of ALT 2008 contained 31 papers selected from 46 submissions, and 5 invited talks. The invited talks were presented in joint sessions of both conferences. ALT 2008 was the 19th in the ALT conference series, established in Japan in 1990. The series Analogical and Inductive Inference is a predecessor of this series: it was held in 1986, 1989 and 1992, co-located with ALT in 1994, and s- sequently merged with ALT. ALT maintains its strong connections to Japan, but has also been held in other countries, such as Australia, Germany, Italy, Sin- pore, Spain and the USA. The ALT conference series is supervised by its Steering Committee: Naoki Abe (IBM T. J.

Application of Pattern Recognition and Adaptive DSP Methods for Spatio-temporal Analysis of Satellite Based Hydrological Datasets

Data assimilation of satellite-based observations of hydrological variables with full numerical physics models can be used to downscale these observations from coarse to high resolution to improve microwave sensor-based soil moisture observations. Moreover, assimilation can also be used to predict related hydrological variables, e.g., precipitation products can be assimilated in a land information system to estimate soil moisture. High quality spatio-temporal observations of these processes are vital for a successful assimilation which in turn needs a detailed analysis and improvement. In this research, pattern recognition and adaptive signal processing methods are developed for the spatio-temporal analysis and enhancement of soil moisture and precipitation datasets. These methods are applied to accomplish the following tasks: (i) a consistency analysis of level-3 soil moisture data from the Advanced Microwave Scanning Radiometer - EOS (AMSR-E) against in-situ soil moisture measurements from the USDA Soil Climate Analysis Network (SCAN). This method performs a consistency assessment of the entire time series in relation to others and provides a spatial distribution of consistency levels. The methodology is based on a combination of wavelet-based feature extraction and oneclass support vector machines (SVM) classifier. Spatial distribution of consistency levels are presented as consistency maps for a region, including the states of Mississippi, Arkansas, and Louisiana. These results are well correlated with the spatial distributions of average soil moisture, and the cumulative counts of dense vegetation; (ii) a modified singular spectral analysis based interpolation scheme is developed and validated on a few geophysical data products including GODAE's high resolution sea surface temperature (GHRSST). This method is later employed to fill the systematic gaps in level-3 AMSR-E soil moisture dataset; (iii) a combination of artificial neural networks and vector space transformation function is used to fuse several high resolution precipitation products (HRPP). The final merged product is statistically superior to any of the individual datasets over a seasonal period. The results have been tested against ground based measurements of rainfall over our study area and average accuracies obtained are 85% in the summer and 55% in the winter 2007.

Artificial Intelligence and Soft Computing, Part I

The LNAI series reports state-of-the-art results in artificial intelligence research, development, education, at a high level and in both printed and electronic form. Enjoying tight cooperation with the R&D community, with numerous individuals, as well as with prestigious organizations and societies, LNAI has grown into the most comprehensive artificial intelligence research forum available. The scope of LNAI spans the whole range of artificial intelligence and intelligent information processing including interdisciplinary topics in a variety of application fields.

Transactions on Rough Sets IX

This book is the ninth volume of the Transactions on Rough Sets series. The 26 papers in it introduce new advances in the foundations and applications of artificial intelligence, engineering, image processing, logic, mathematics, medicine, music, and science.

Advances in Information Retrieval

This book constitutes the proceedings of the 34th European Conference on IR Research, ECIR 2012, held in Barcelona, Spain, in April 2012. The 37 full papers, 28 poster papers and 7 demonstrations presented in this volume were carefully reviewed and selected from 167 submissions. The contributions are organized in sections named: query representation; blogs and online-community search; semi-structured retrieval; evaluation; applications; retrieval models; image and video retrieval; text and content classification, categorisation, clustering; systems efficiency; industry track; and posters.

Internet of Things

The book aims to provide a broad overview of various topics of the Internet of Things (IoT) from the research and development priorities to enabling technologies, architecture, security, privacy, interoperability and industrial applications. It is intended to be a standalone book in a series that covers the Internet of Things activities of the IERC ? Internet of Things European Research Cluster from technology to international cooperation and the global state of play. The book builds on the ideas put forward by the European research Cluster on the Internet of Things Strategic Research Agenda and presents global views and state of the art results on the challenges facing the research, development and deployment of IoT at the global level.Today we see the integration of Industrial, Business and Consumer Internet which is bringing together the Internet of People, Internet of Things, Internet of Energy, Internet of Vehicles, Internet of Media, Services and Enterprises in forming the backbone of the digital

economy, the digital society and the foundation for the future knowledge and innovation based economy in supporting solutions for the emerging challenges of public health, aging population, environmental protection and climate change, the conservation of energy and scarce materials, enhancements to safety and security and the continuation and growth of economic prosperity.Penetration of smartphones and advances in machine to machine and wireless communication technology will be the main drivers for IoT development. The IoT contribution is in the increased value of information created by the number of interconnections among things and the transformation of the processed information into knowledge shared into the Internet of Everything.

Pattern Recognition, Machine Intelligence and Biometrics

"Pattern Recognition, Machine Intelligence and Biometrics" covers the most recent developments in Pattern Recognition and its applications, using artificial intelligence technologies within an increasingly critical field. It covers topics such as: image analysis and fingerprint recognition; facial expressions and emotions; handwriting and signatures; iris recognition; hand-palm gestures; and multimodal based research. The applications span many fields, from engineering, scientific studies and experiments, to biomedical and diagnostic applications, to personal identification and homeland security. In addition, computer modeling and simulations of human behaviors are addressed in this collection of 31 chapters by top-ranked professionals from all over the world in the field of PR/AI/Biometrics. The book is intended for researchers and graduate students in Computer and Information Science, and in Communication and Control Engineering. Dr. Patrick S. P. Wang is a Professor Emeritus at the College of Computer and Information Science, Northeastern University, USA, Zijiang Chair of ECNU, Shanghai, and NSC Visiting Chair Professor of NTUST, Taipei.

Meta-Learning in Computational Intelligence

Computational Intelligence (CI) community has developed hundreds of algorithms for intelligent data analysis, but still many hard problems in computer vision, signal processing or text and multimedia understanding, problems that require deep learning techniques, are open. Modern data mining packages contain numerous modules for data acquisition, pre-processing, feature selection and construction, instance selection, classification, association and approximation methods, optimization techniques, pattern discovery, clusterization, visualization and post-processing. A large data mining package allows for billions of ways in which these modules can be combined. No human expert can claim to explore and understand all possibilities in the knowledge discovery process. This is where algorithms that learn how to learnl come to rescue. Operating in the space of all available data transformations and optimization techniques these algorithms use meta-knowledge about learning processes automatically extracted from experience of solving diverse problems. Inferences about transformations useful in different contexts help to construct learning algorithms that can uncover various aspects of knowledge hidden in the data. Meta-learning shifts the focus of the whole CI field from individual learning algorithms to the higher level of learning how to learn. This book defines and reveals new theoretical and practical trends in meta-learning, inspiring the readers to further research in this exciting field.

AI 2011: Advances in Artificial Intelligence

This book constitutes the refereed proceedings of the 24th Australasian Joint Conference on Artificial Intelligence, AI 2011, held in Perth, Australia, in December 2011. The 82 revised full papers presented were carefully reviewed and selected from 193 submissions. The papers are organized in topical sections on data mining and knowledge discovery, machine learning, evolutionary computation and optimization, intelligent agent systems, logic and reasoning, vision and graphics, image processing, natural language processing, cognitive modeling and simulation technology, and AI applications.

Information Sciences and Systems 2013

Based on a rigorous selection from 58 proposals coming from across the world, this volume will include some of the most recent ideas and technical results in computer systems, computer science, and computer-communication networks. The book will offer the reader with a timely access to innovative research from many different areas of the world where advances in computing and communications are created.

Analyzing Risk through Probabilistic Modeling in Operations Research

Probabilistic modeling represents a subject spanning many branches of mathematics, economics, and computer science to connect pure mathematics with applied sciences. Operational research also relies on this connection to enable the improvement of business functions and decision making. Analyzing Risk through Probabilistic Modeling in Operations Research is an authoritative reference publication discussing the various challenges in management and decision science. Featuring exhaustive coverage on a range of topics within operational research including, but not limited to, decision analysis, data mining, process modeling, probabilistic interpolation and extrapolation, and optimization methods, this book is an essential reference source for decision makers, academicians, researchers, advanced-level students, technology developers, and government officials interested in the implementation of probabilistic modeling in various business applications.

Artificial Intelligence and Soft Computing – ICAISC 2008

This book constitutes the refereed proceedings of the 9th International Conference on Artificial Intelligence and Soft Computing, ICAISC 2008, held in Zakopane, Poland, in June 2008. The 116 revised contributed papers presented were carefully reviewed and selected from 320 submissions. The papers are organized in topical sections on neural networks and their applications, fuzzy systems and their applications, evolutionary algorithms and their applications, classification, rule discovery and clustering, image analysis, speech and robotics, bioinformatics and medical applications, various problems of artificial intelligence, and agent systems.

Advances in Bioinformatics

The fields of Bioinformatics and Computational Biology have been growing steadily over the last few years boosted by an increasing need for computational techniques that can efficiently handle the huge amounts of data produced by the new experimental techniques in Biology. This calls for new algorithms and - proaches from fields such as Data Integration, Statistics, Data Mining, Machine Learning, Optimization, Computer Science and Artificial Intelligence. Also, new global approaches, such as Systems Biology, have been emerging replacing the reductionist view that dominated biological research in the last d- ades. Indeed, Biology is more and more a science of information needing tools from the information technology field. The interaction of researchers from diff- ent scientific fields is, more than ever, of foremost importance and we hope this event will contribute to this effort. IWPACBB'10 technical program included a total of 30 papers (26 long papers and 4 short papers) spanning many different sub-fields in Bioinformatics and Computational Biology. Therefore, the technical program of the conference will certainly be diverse, challenging and will promote the interaction among computer scientists, mathematicians, biologists and other researchers. We would like to thank all the contributing authors, as well as the members of the Program Committee and the Organizing Committee for their hard and highly valuable work. Their work has helped to contribute to the success of the IWAPCBB’10 event. IWPACBB’10 wouldn’t exist without your contribution.

Machine Learning and Data Mining in Pattern Recognition

This book constitutes the refereed proceedings of the 8th International Conference, MLDM 2012, held in Berlin, Germany in July 2012. The 51 revised full papers presented were carefully reviewed and selected from 212 submissions. The topics range from theoretical topics for classification, clustering, association rule and pattern mining to specific data mining methods for the different multimedia data types such as image mining, text mining, video mining and web mining.

Speech and Computer

This book constitutes the proceedings of the 20th International Conference on Speech and Computer, SPECOM 2018, held in Leipzig, Germany, in September 2018. The 79 papers presented in this volume were carefully reviewed and selected from 132 submissions. The papers present current research in the area of computer speech processing, including recognition, synthesis, understanding and related domains like signal processing, language and text processing, computational paralinguistics, multi-modal speech processing or human-computer interaction.

Machine Learning and its Applications

In recent years, machine learning has gained a lot of interest. Due to the advances in processor technology and the availability of large amounts of data, machine learning techniques have provided

astounding results in areas such as object recognition or natural language processing. New approaches, e.g. deep learning, have provided groundbreaking outcomes in fields such as multimedia mining or voice recognition. Machine learning is now used in virtually every domain and deep learning algorithms are present in many devices such as smartphones, cars, drones, healthcare equipment, or smart home devices. The Internet, cloud computing and the Internet of Things produce a tsunami of data and machine learning provides the methods to effectively analyze the data and discover actionable knowledge. This book describes the most common machine learning techniques such as Bayesian models, support vector machines, decision tree induction, regression analysis, and recurrent and convolutional neural networks. It first gives an introduction into the principles of machine learning. It then covers the basic methods including the mathematical foundations. The biggest part of the book provides common machine learning algorithms and their applications. Finally, the book gives an outlook into some of the future developments and possible new research areas of machine learning and artificial intelligence in general. This book is meant to be an introduction into machine learning. It does not require prior knowledge in this area. It covers some of the basic mathematical principle but intends to be understandable even without a background in mathematics. It can be read chapter wise and intends to be comprehensible, even when not starting in the beginning. Finally, it also intends to be a reference book. Key Features: Describes real world problems that can be solved using Machine Learning Provides methods for directly applying Machine Learning techniques to concrete real world problems Demonstrates how to apply Machine Learning techniques using different frameworks such as TensorFlow, MALLET, R

Cause Effect Pairs in Machine Learning

This book presents ground-breaking advances in the domain of causal structure learning. The problem of distinguishing cause from effect (“Does altitude cause a change in atmospheric pressure, or vice versa?”) is here cast as a binary classification problem, to be tackled by machine learning algorithms. Based on the results of the ChaLearn Cause-Effect Pairs Challenge, this book reveals that the joint distribution of two variables can be scrutinized by machine learning algorithms to reveal the possible existence of a “causal mechanism”, in the sense that the values of one variable may have been generated from the values of the other. This book provides both tutorial material on the state-of-the-art on cause-effect pairs and exposes the reader to more advanced material, with a collection of selected papers. Supplemental material includes videos, slides, and code which can be found on the workshop website. Discovering causal relationships from observational data will become increasingly important in data science with the increasing amount of available data, as a means of detecting potential triggers in epidemiology, social sciences, economy, biology, medicine, and other sciences.

Knowledge Graphs for eXplainable Artificial Intelligence: Foundations, Applications and Challenges

The latest advances in Artificial Intelligence and (deep) Machine Learning in particular revealed a major drawback of modern intelligent systems, namely the inability to explain their decisions in a way that humans can easily understand. While eXplainable AI rapidly became an active area of research in response to this need for improved understandability and trustworthiness, the field of Knowledge Representation and Reasoning (KRR) has on the other hand a long-standing tradition in managing information in a symbolic, human-understandable form. This book provides the first comprehensive collection of research contributions on the role of knowledge graphs for eXplainable AI (KG4XAI), and the papers included here present academic and industrial research focused on the theory, methods and implementations of AI systems that use structured knowledge to generate reliable explanations. Introductory material on knowledge graphs is included for those readers with only a minimal background in the field, as well as specific chapters devoted to advanced methods, applications and case-studies that use knowledge graphs as a part of knowledge-based, explainable systems (KBX-systems). The final chapters explore current challenges and future research directions in the area of knowledge graphs for eXplainable AI. The book not only provides a scholarly, state-of-the-art overview of research in this subject area, but also fosters the hybrid combination of symbolic and subsymbolic AI methods, and will be of interest to all those working in the field.

A Beginner's Guide to Image Shape Feature Extraction Techniques

This book emphasizes various image shape feature extraction methods which are necessary for image shape recognition and classification. Focussing on a shape feature extraction technique used in content-based image retrieval (CBIR), it explains different applications of image shape features in

the field of content-based image retrieval. Showcasing useful applications and illustrating examples in many interdisciplinary fields, the present book is aimed at researchers and graduate students in electrical engineering, data science, computer science, medicine, and machine learning including medical physics and information technology.

Feature Selection for High-Dimensional Data

This book offers a coherent and comprehensive approach to feature subset selection in the scope of classification problems, explaining the foundations, real application problems and the challenges of feature selection for high-dimensional data. The authors first focus on the analysis and synthesis of feature selection algorithms, presenting a comprehensive review of basic concepts and experimental results of the most well-known algorithms. They then address different real scenarios with high-dimensional data, showing the use of feature selection algorithms in different contexts with different requirements and information: microarray data, intrusion detection, tear film lipid layer classification and cost-based features. The book then delves into the scenario of big dimension, paying attention to important problems under high-dimensional spaces, such as scalability, distributed processing and real-time processing, scenarios that open up new and interesting challenges for researchers. The book is useful for practitioners, researchers and graduate students in the areas of machine learning and data mining.

Advances in Neural Networks Research

IJCNN is the flagship conference of the INNS, as well as the IEEE Neural Networks Society. It has arguably been the preeminent conference in the field, even as neural network conferences have proliferated and specialized. As the number of conferences has grown, its strongest competition has migrated away from an emphasis on neural networks. IJCNN has embraced the proliferation of spin-off and related fields (see the topic list, below), while maintaining a core emphasis befitting its name. It has also succeeded in enforcing an emphasis on quality.

Recent Advances in Ensembles for Feature Selection

This book offers a comprehensive overview of ensemble learning in the field of feature selection (FS), which consists of combining the output of multiple methods to obtain better results than any single method. It reviews various techniques for combining partial results, measuring diversity and evaluating ensemble performance. With the advent of Big Data, feature selection (FS) has become more necessary than ever to achieve dimensionality reduction. With so many methods available, it is difficult to choose the most appropriate one for a given setting, thus making the ensemble paradigm an interesting alternative. The authors first focus on the foundations of ensemble learning and classical approaches, before diving into the specific aspects of ensembles for FS, such as combining partial results, measuring diversity and evaluating ensemble performance. Lastly, the book shows examples of successful applications of ensembles for FS and introduces the new challenges that researchers now face. As such, the book offers a valuable guide for all practitioners, researchers and graduate students in the areas of machine learning and data mining.

Math Physics Foundation of Advanced Remote Sensing Digital Image Processing

This book focuses on the mathematical and physical foundations of remote sensing digital image processing and introduces key algorithms utilized in this area. The book fully introduces the basic mathematical and physical process of digital imaging, the basic theory and algorithm of pixel image processing, and the higher-order image processing algorithm and its application. This book skillfully and closely integrates theory, algorithms, and applications, making it simple for readers to understand and use. Researchers and students working in the fields of remote sensing, computer vision, geographic information science, electronic information, etc., can profit from this book. For their work and research in digital image processing, they can master the fundamentals of imaging and image processing techniques.

Feature Engineering for Machine Learning and Data Analytics

Focusing on feature extraction while also covering issues and techniques such as image acquisition, sampling theory, point operations and low-level feature extraction, the authors have a clear and coherent approach that will appeal to a wide range of students and professionals. Ideal module text for

courses in artificial intelligence, image processing and computer vision Essential reading for engineers and academics working in this cutting-edge field Supported by free software on a companion website

Feature Extraction and Image Processing

The Law And Practice Of The United Nations

This fully up-dated, third revised edition of Conforti's thought-provoking and challenging textbook, The Law and Practice of the United Nations, provides a comprehensive legal analysis of problems concerning membership, the structure of UN organs, their functions and their acts, taking into consideration the text of the Charter, its historical origins, and, particularly, the practice of the organs. Its main focus is on the practice of the Security Council. In particular the action of the Security Council under Chapter VII has been taken into account. The legal literature on Chapter VII - a literature which has grown enormously in recent times - has also been considered. The fact that the legal aspects of the action or the inaction of the Security Council have been discussed to an unusually large extent by ordinary people at the time of the war against Iraq and even later is worth noting. The importance of the role of the United Nations, and the content of the rules governing it, has become a leitmotiv of all debates on international politics. Consequently, the opinion often held in the past, according to which it was useless to deal with the legal aspects of the United Nations activity, can be considered as obsolete.

The Law and Practice of the United Nations

The Law and Practice of the United Nations examines the law of the United Nations through an analysis of the Organization’s practice from its inception until the present.

The Law and Practice of the United Nations

Revised and updated, The Law and Practice of the United Nations provides an analysis of the main legal issues surrounding the United Nations’ practice, including a thorough discussion of Chapter VII of the Charter and its interpretation.

The Law and Practice of the United Nations

"In memory of Professor Thomas M. Franck"

Law and Practice of the United Nations

The political changes in the world have profoundly altered the United Nations. This new book is one of the first to describe the structure of the world organization in the present context of international relations. "The United Nations: Law and Practice" is a no-nonsense book, concise, informative and up-to-date. In their respective careers as diplomats or academics, all authors combine vast practical and theoretical experience in dealing with the UN.

The United Nations

This book combines primary materials with expert commentary, demonstrating the interaction between law and practice in the UN organisation, as well as the possibilities and limitations of multilateral institutions in general. Each chapter begins with a short introductory essay by the authors that describes how the documents that follow illustrate a set of legal, institutional, and political issues relevant to the practice of diplomacy and the development of public international law through the United Nations. This second edition updates the materials in the first edition and introduces new features that reflect a changing global landscape.--Résumé de l'éditeur.

The Law and Practice of the United Nations

This new edition is a comprehensive manual of the rules of procedure for the conduct of business at the UN General Assembly, at international conferences and at assemblies of inter-governmental organisations such as the IAEA, ICAO, ILO, IMO and WHO. It examines the legal basis of these rules, the history of their development and the attempts at their codification. At the heart of the book is an examination of the practical applications of rules of procedure. Sabel also considers whether certain procedural rules and applications have become so well established that they have now attained the

status of customary international law. The book is of interest to those involved in international law, international relations and international organisations. It also serves as a practical manual for delegates to the UN General Assembly and to international conferences.

Law and Practice of the United Nations

The purpose of these volumes is to examine, explain and appraise contributions made by the United Nations system to international law and the law-creating process. The work assesses the effect UN institutions have had on the law-making process, and the extent to which that law has been accepted by and evidenced in contemporary state practice. It is divided into three main parts. The first examines the practical as well as conceptual aspects of the UN system as a source of law. The second part deals with different fields of activity which have become the subjects of legal rules and processes. Areas covered include human rights, use of force and economic relations. In addition, topics that have not previously been examined in such a comprehensive manner, such as shipping, aviation, and private international law, are also discussed. The third part covers the internal law of the UN system - international civil services and financial contributions.

Procedure at International Conferences

Revised edition of : The law and practice of the International Court, 1920-1996. 3rd edition 1997.

United Nations Legal Order

Volume 2 addresses jurisdiction and the various mechanisms and modalities of international cooperation in penal matters, which for all practical purposes, apply to both the direct and indirect enforcement methods of ICL. These mechanisms and modalities of international cooperation are used not only in bilateral interstate cooperation in penal matters but they are also employed by international tribunals, including the ICC, in their relations with states. This volume is divided into 5 chapters which are titled as: Chapter 1: Policies and Modalities (Modalities of International Cooperation in Penal Matters; The Duty to Prosecute and/or Extradite: Aut Dedere Aut Judicare; Globalization of International Enforcement Mechanisms: The Problem of Legitimacy; Globalization of Law Enforcement and Intelligence Gathering and Sharing); Chapter 2: Jurisdiction (Extraterritorial Jurisdiction; Universal Jurisdiction; Competing and Overlapping Jurisdictions; Immunities and Exceptions; The European Union and the Schengen Agreement); Chapter 3: Extradition (Law and Practice in the United States; The European Approach; Commentary on the United Nations Draft Model Law on Extradition); Chapter 4:Judicial Assistance and Mutual Cooperation in Penal Matters (United States Treaties on Mutual Assistance in Criminal Matters; Commentary on the United Nations Draft Model Law on Mutual Legal Assistance; Inter-State Cooperation in Penal Matters in the Commonwealth; The Council of Europe and the European Union; European Perspective on International Cooperation in Matters of Terrorism; Freezing and Seizing of Assets: Controlling Money Laundering); Chapter 5: Recognition of Foreign Penal Judgments, Transfer of Criminal Proceedings, and Execution of Foreign Penal Sentences (Introduction to Recognition of Foreign Penal Judgments; Introduction to Transfer of Criminal Proceedings; Transfer of Criminal Proceedings: The European System; The Lockerbie Model of Transfer of Proceedings; International Perspective on Transfer of Prisoners and Execution of Foreign Penal Judgments; United States Policies and Practices on the Execution of Foreign Penal Sentences).

United Nations Legal Order

This book aims to provide a comprehensive legal analysis of problems concerning membership, the structure of the United Nations organs, their functions and their acts taking into consideration the text of the Charter, its historical origins, and, particularly, the practice of the organs. One of the aims of the book is to trace precisely the `story' of the United Nations from its birth through an analysis of the practice. Moreover, since the Charter has never undergone any substantive modifications, one cannot exclude that what may appear to be old and obsolete today could become of current interest in the future. This volume is the up-to-date English version of the fifth edition of an Italian textbook on the United Nations which was first published in 1971. An extensive bibliography conveniently precedes every section in each of the chapters, which is of substantial value to anyone studying the United Nations.

The court and the United Nations

This new third edition is a comprehensive manual of the rules of procedure and conduct of business at the UN General Assembly, at international conferences and at assemblies of inter-governmental organisations such as the World Health Organization. It examines the legal basis of these rules, the history of their development and the attempts at their codification. At the heart of the book is an examination of the practical applications of rules of procedure. Procedural rulings, updated to October 2016, are quoted from the records of UN General Assembly meetings, from assemblies of international organisations and from treaty-making conferences. This book is of interest to those involved in international law, international relations and international organisations. It also serves as an indispensable practical guide for delegates to the UN General Assembly and to international inter-governmental conferences. The first edition of this book was awarded the American Society of International Law 'Special Award'.

International Criminal Law, Volume 2: Multilateral and Bilateral Enforcement Mechanisms

Updated throughout, this is the third edition of Ian Hurd's lively introduction to the law and politics of international organizations.

The Law and Practice of the United Nations

UNESCO pub. Study of the role of UN in the development of legal theories and practice in international law - examines international sources of law such as resolutions of the General Assembly and the Security Council, judicial decisions of the ICJ, etc.; considers the impact of political ideologies and international relations on recognition of the right of self determination and the new international economic order. References.

Rules of Procedure at the UN and at Inter-Governmental Conferences

Law and Practice of the United Nations: Documents and Commentary combines primary materials with expert commentary demonstrating the interaction between law and practice in the UN organization, as well as the possibilities and limitations of multilateral institutions in general. Each chapterbegins with a short introductory essay describing how the documents that ensue illustrate a set of legal, institutional, and political issues relevant to the practice of diplomacy and the development of public international law through the United Nations. Each chapter also includes questions toguide discussion of the primary materials, and a brief bibliography to facilitate further research on the subject.This second edition addresses the most challenging issues confronting the United Nations and the global community today, from terrorism to climate change, from poverty to nuclear proliferation. New features include hypothetical fact scenarios to test the understanding of concepts in each chapter.This edition contains expanded author commentary, while maintaining the focus on primary materials. Such materials enable a realistic presentation of the work of international diplomacy: the negotiation, interpretation and application of such texts are an important part of what actually takes placeat the United Nations and other international organizations.This work is ideal for courses on the United Nations or International Organizations, taught in both law and international relations programs.

International Organizations

A special course adoption price is available for an order of six or more copies from a university bookstore. Contact cs@brillusa.com or sales@brill.nl.International and Foreign Legal Research: A Coursebook, by Marci Hoffman and Mary Rumsey, now in a second, revised edition, is designed for classes in foreign and international legal research. Following a general section on basic concepts, topics covered in the book range from treaty research to chapters on particular subjects of international law. Coverage also includes chapters on researching foreign and comparative law as well as major international organizations, including the UN and the EU. International and Foreign Legal Research offers a possible roadmap for structuring a class in international and foreign legal research while also serving as a tool for quick look-ups when a researcher requires direction on a topic or information on a source.Developed for use in legal research courses, International and Foreign Legal Research is an invaluable resource for librarians, students, law professors, and other researchers in the research of foreign and international law."

United Nations Law Making

This third edition of International Arbitration Law and Practice has been largely enriched by covering international commercial arbitrations, investment treaty arbitrations, arbitrations between public bodies, between states and individuals, the UNCITRAL model law and Iran-US Tribunal proceedings as well as commodity arbitration, online arbitration and sports arbitral proceedings. International Arbitration Law and Practice, 3rd edition elaborates new concepts such as a definition of international arbitration based on procedural law (different from transnational law) and a doctrine (the tronc commun doctrine) to identify the applicable substantive law on disputes between parties belonging to different countries. It further suggests that a law of international arbitration has arisen from the various conventions and laws. Besides dealing with all the aspects of arbitration on a topic by topic basis, the writer presents a third generation arbitration which builds on analysis of major obstacles to a smooth running arbitration.International Arbitration Law and Practice, 3rd edition is a work that anyone involved in arbitral proceedings will find to be absolutely indispensable.

Law and Practice of the United Nations

Practice of states at the time of entry into force of the United Nations Convention on the Law of the Sea.

Searching the Law, 3d Edition

This landmark publication in the field of international law delivers expert assessment of new developments in the important work of the International Court of Justice (ICJ) from a team of renowned editors and commentators.The ICJ is the principal judicial organ of the United Nations and plays a central role in both the peaceful settlement of international disputes and the development of international law. This comprehensive Commentary on the Statute of the International Court of Justice, now in its third edition, analyses in detail not only the Statute of the Court itself but also the related provisions of the United Nations Charter as well as the relevant provisions of the Court's Rules of Procedure. Six years after the publication of the second edition, the third edition of the Commentary embraces current events before the International Court of Justice as well as before other courts and tribunals relevant for the interpretation and application of its Statute.The Commentary provides a comprehensive overview and analysis of all legal questions and issues the Court has had to address in the past, and looks forward to those it will have to address in the future. It illuminates the central issues of procedure and substance that the Court and counsel appearing before it face in their day-to-day work. In addition to commentary covering all of the articles of the Statute of the ICJ, plus the relevant articles of the Charter of the United Nations, the book includes two scene-setting chapters: Historical Introduction and General Principles of Procedural Law, as well as important and instructive chapters on Counter-Claims, Discontinuation and Withdrawal, and Evidentiary Issues.

International and Foreign Legal Research

The only human rights textbook truly merging law with practice in a comprehensive and enjoyable manner.

International Arbitration Law and Practice, Third Edition

A third edition textbook providing a comprehensive account of the law of treaties from the viewpoint of an experienced practitioner.

The Law of the Sea

This volume examines the role of international law in the Security Council's decisions and decision-making process since the end of the Cold War, with the principle of legality as theoretical framework.

Third World Attitudes Toward International Law

The United Nations began as an alliance during World War II. Eventually, however, the UN came to approximate a universal organization - i.e., open to and aspiring to include all States. This presents a legal question, for Article 4 of the Charter contains substantive criteria to limit admission of States to the UN and no formal amendment has touched that part of the Charter. This book gives an up-to-date account of admission to the UN, from the 1950s logjam through on-going controversies like Kosovo and Taiwan. With reference to Charter law, the book considers how Article 4 came to accommodate

universality and what the future of a universal organization in a world of politically diverse States might be.

Human Rights and the UN: Practice Before the Treaty Bodies

This work is a comparative study of domestic implementation of Security Council mandatory sanctions taken under Article 41, Chapter VII of the UN Charter, including the establishment of the two international criminal tribunals, the ICTY and ICTR, and recent resolutions on the combating of the financing of terrorism. The book examines implementation in 16 select States in Europe, America, Asia, the Middle East and Africa, underlining also the particular problems arising from sanctions implementation by the European Union, by a permanently neutral and former non-Member State - Switzerland - and by States confronted with special economic problems within the meaning of Article 50 of the UN Charter. Three interrelated themes are addressed. The first, of a theoretical nature, concerns the question of whether implementation of Security Council resolutions, particularly where perceived to be in fulfilment of community objectives, poses problems which are in some way distinct from those raised by the implementation of other conventional international law obligations, thereby shedding a different light on the traditional relationship between international and municipal law. The second concerns the effectiveness of the decisions of the Security Council viewed from the perspective of the effective mise en oeuvre of these decisions in national law. The third theme concerns the legitimacy of Security Council resolutions as seen from the viewpoint of domestic legal systems, that is the extent to which Security Council decisions encroach on internationally or constitutionally protected individual rights and the potential role played by domestic courts in reviewing the decisions of the Security Council.The latter has assumed particular importance in the framework of the combating of the financing of terrorism. This work, which brings together the research results of 29 academics and experts, is the second publication within the framework of a project on Security Council sanctions carried out under the auspices of the Graduate Institute of International Studies. The first, which looked at a broad set of issues, was entitled "United Nations Sanctions and International Law" and was published by Kluwer Law International in 2001.

The Statute of the International Court of Justice

An Introduction to Contemporary International Law: A Policy-Oriented Perspective introduces the reader to all major aspects of contemporary international law. It applies the highly acclaimed approach developed by the New Haven School of International Law, holding international law as an ongoing process of authoritative decision-making through which the members of the world community identify, clarify, and secure their common interests. Unlike conventional works in international law, this book is organized and structured in terms of the process of decision making in the international arena, and references both classic historical examples and contemporary events to illustrate international legal processes and principles. Using contemporary examples, this Third Edition builds on the previous editions by contextualizing and dramatizing recent events with reference to seven features that characterize the New Haven School approach to international law: participants, perspectives, arenas of decision, bases of power, strategies, outcomes, and effects. This new edition highlights cutting-edge ideas in international law, including the right to self-determination, the evolution of Taiwan statehood, the expanding scope of international concern and the duty of states to protect human rights, the trend towards greater accountability for states and individual decision-makers under international law, and the vital role individual responsibility plays in the emerging field of international criminal law. It offers a new generation the intellectual tools needed to act as responsible citizens in a world community seeking human dignity and human security for all people.

International Human Rights Law and Practice

With the fall of communism and the appearance of a new world order, it is hoped that the United Nations will become the principle organisation for the regulation of relations between states as well as for the settlement of conflict. The recent crises over Iraq and the continued bloodshed in the former Yugoslavia have ensured a higher profile for the United Nations but have at the same time placed great pressure on that organisation to resolve conflict and organise relations between states in a manner that is acceptable to the international community. The essays collected in this volume are published in conjunction with the International Law Group. Providing valuable statements of the fundamentals of international law from leading authorities, they re-examine the Declaration of Principles of International Law Governing Friendly Relations Between States. The Declaration is the nearest thing that states have

to an international constitution and embodies the fundamental values of the international legal system. The great changes in the international system since 1989 hold out the prospect of the reinvigoration of the Charter, perhaps for a new system of international legal relations, and make the reconsideration of the Declaration particularly timely.

Modern Treaty Law and Practice

This English edition of the German "Lexikon der Vereinten Nationen" provides concise and comprehensive information not only about the structure of the UN system, its goals and functions, but about recent developments and reform efforts in the face of global opportunities and challenges. The contributing authors are academic scholars of international law, economics and political sciences; active and former diplomats and UN officials; journalists and members of non-governmental organizations (NGOs), and offer a variety of interesting perspectives. The entries are provided with Internet addresses for further information and are supplemented in the annex with a trilingual list (English-French-German) of the most important institutions and items of the official terminology and a list of information facilities concerning the UN. Readership: scholars and students of international law, international economics and political sciences, teachers, journalists, diplomats and politicians in the parliaments of the UN member states. "This new encyclopedia on the United Nations is a welcome addition to the works of academic research and political analysis covering the organization, its complex goals in the post-cold war era, and its ever broader role in the new millennium. While taking stock of more than half a century's achievements and setbacks, the encyclopedia also reflects the many ways in which the United Nations touches the lives of people everywhere." from the Preface by UN Secretary-General Kofi Annan

The United Nations Security Council in the Post-Cold War Era

The United Nations, whose specialized agencies were the subject of an Appendix to the 1958 edition of Oppenheim's International Law: Peace, has expanded beyond all recognition since its founding in 1945.This volume represents a study that is entirely new, but prepared in the way that has become so familiar over succeeding editions of Oppenheim. An authoritative and comprehensive study of the United Nations' legal practice, this volume covers the formal structures of the UN as it has expanded over the years, and all that this complex organization does. All substantive issues are addressed in separate sections, including among others, the responsibilities of the UN, financing, immunities, human rights, preventing armed conflicts and peacekeeping, and judicial matters. In examining the evolving structures and ever expanding work of the United Nations, this volume follows the long-held tradition of Oppenheim by presenting facts uncoloured by personal opinion, in a succinct text that also offers in the footnotes a wealth of information and ideas to be explored. It is book that, while making all necessary reference to the Charter, the Statute of the International Court of Justice, and other legal instruments, tells of the realities of the legal issues as they arise in the day to day practice of the United Nations. Missions to the UN, Ministries of Foreign Affairs, practitioners of international law, academics, and students will all find this book to be vital in their understanding of the workings of the legal practice of the UN. Research for this publication was made possible by The Balzan Prize, which was awarded to Rosalyn Higgins in 2007 by the International Balzan Foundation.

Admission to the United Nations

This volume contains the report of the International Law Commission on the work of its fifty-fourth session (29 April - 7 June and 22 July – 16 August 2002). The issues discussed at that session included: reservations to treaties, diplomatic protection, unilateral acts of States, state responsibility, and international liability for injurious consequences arising out of acts not prohibited by international law, and responsibilities of international organizations.

National Implementation of United Nations Sanctions

This Yearbook is a compilation of all substantive documents related to the work of the Commission and its Working Groups. It also reproduces the annual Report of the Commission which is published as Supplement No. 17 of the "Official Records of the General Assembly". UNCITRAL is the core legal body of the United Nations system in the field of international trade law. It specializes in the modernization and harmonization of rules on international business.

An Introduction to Contemporary International Law

Julie Mertus' highly acclaimed text continues to be the only completely up-to-date comprehensive yet succinct guide to the United Nations human rights system. Today, virtually all UN bodies and specialized agencies are undertaking efforts to incorporate the promotion or protection of human rights into their programs and activities. The United Nations and Human Rights examines these recent initiatives within the broader context of human rights practice, including the promotion of individual rights, management of international conflict and the advancement of agendas of social movements. The fully revised and updated second edition not only provides a complete guide to the development, structure and procedures within the UN human rights system, but also reflects the vital changes that have occurred within the UN system, devoting considerable attention to expanding the range of issues discussed, including: new developments in the Office of the High Commissioner for Human Rights the current controversy surrounding the new Human Rights Council expanded treatment of economic and social rights. A superb addition to any human rights syllabus, this book maintains its position as essential reading for students and practitioners of human rights, international relations and international law.

The United Nations and the Principles of International Law

The book is a study of the rules of procedure of international conferences. It examines the legal basis of these rules of procedure and the history of their development since the end of the Second World War. The central part of the work consists of an examination of the practical application of rules of procedure at international conferences. The book also compares the application of rules at conferences with the relevant practice of the UN General Assembly, and the assemblies of international organisations such as the WHO and ILO. The book examines whether certain procedural rules and applications have become so well established that they have by now attained the status of customary international law.

Report of the Special Committee on the Charter of the United Nations and on the Strengthening of the Role of the Organization

A Concise Encyclopedia of the United Nations

Computerized Adaptive Testing: Theory and Practice

This book offers a comprehensive introduction to the latest developments in the theory and practice of CAT. It can be used both as a basic reference and a valuable resource on test theory. It covers such topics as item selection and ability estimation, item pool development and maintenance, item calibration and model fit, and testlet-based adaptive testing, as well as the operational aspects of existing large-scale CAT programs.

Computerized Adaptive Testing

Computerized Adaptive Testing (CAT) is now entering a new phase of its existence, having developed into a viable alternative form of measurement backed by rigorous technology involving far more than hardware and software. Computer technology, test development, statistics, and mental test theory all play a role in CAT and are thus united in this primer. Based on 30 years of solid research, this book will educate the novice and serve as a compendium of state-of-the-art data for professionals. A hypothetical test taken as a prelude to employment, the "Gedanken Computerized Adaptive Test," is used throughout as a common example that highlights important features and problems presented by different types of computerized testing.

Computerized Adaptive Testing

Modern computer technology has opened up several new possibilities for optimizing the administration of educational and psychological tests. In computer adaptive testing (CAT), tests are automatically tailored to the proficiency level of the individual examinees. Currently, nearly all large-scale testing programs in the western world are already adaptive or in the process of becoming so. Written by active CAT researchers from Europe and North America, the chapters offer a comprehensive introduction to the latest developments in the theory and practice of CAT. The book can be used both as a basic reference on the state of the art in CAT and a valuable resource in graduate courses on test theory. The theoretical chapters in this book cover such topics as item selection and ability estimation, item

pool development and maintenance, item calibration and model fit, and testlet-based adaptive testing. The practical chapters describe the operational aspects of existing large-scale CAT programs.

Proceedings of the First Conference on Computerized Adaptive Testing, Washington, D.C., June 12 and 13, 1975

This book constitutes the refereed proceedings of the First International Conference on Interdisciplinary Research on Technology, Education and Communication, ITEC 2010, held in Kortrijk, Belgium, in May 2010. The 11 revised full papers presented were carefully reviewed and selected from 38 submissions. The papers address all current issues within the fields of computer sciences, applied linguistics, methodology, and educational technology with special emphasis on topics such as distributed decision support, agent based systems, heuristic optimization, heuristics for data mining, distributed search, pervasive learning, mobile learning electronic language learning environments, language testing, CorpusCALL, authoring systems statistical modelling, item response theory, data mining, electronic assessment adaptive and adaptable learning environments, instructional design, game-based learning, learner characteristics, mobile learning.

Interdisciplinary Approaches to Adaptive Learning: A Look at the Neighbours

This authoritative reference work contains more than 300 entries covering all aspects of the multi-disciplinary field of adult development and aging Brings together concise, accurate summaries of classic topics as well as the most recent thinking and research in new areas Covers a broad range of issues, from biological and physiological changes in the body to changes in cognition, personality, and social roles to applied areas such as psychotherapy, long-term care, and end-of-life issues Includes contributions from major researchers in the academic and clinical realms 3 Volumes www.encyclopediaadulthoodandaging.com

The Encyclopedia of Adulthood and Aging, 3 Volume Set

The arrival of the computer in educational and psychological testing has led to the current popularity of adaptive testing---a testing format in which the computer uses statistical information about the test items to automatically adapt their selection to a real-time update of the test taker’s ability estimate. This book covers such key features of adaptive testing as item selection and ability estimation, adaptive testing with multidimensional abilities, sequencing adaptive test batteries, multistage adaptive testing, item-pool design and maintenance, estimation of item and item-family parameters, item and person fit, as well as adaptive mastery and classification testing. It also shows how these features are used in the daily operations of several large-scale adaptive testing programs.

Elements of Adaptive Testing

The eight-volume set LNCS 13375 – 13382 constitutes the proceedings of the 22nd International Conference on Computational Science and Its Applications, ICCSA 2022, which was held in Malaga, Spain during July 4 – 7, 2022. The first two volumes contain the proceedings from ICCSA 2022, which are the 57 full and 24 short papers presented in these books were carefully reviewed and selected from 279 submissions. The other six volumes present the workshop proceedings, containing 285 papers out of 815 submissions. These six volumes includes the proceedings of the following workshops: Advances in Artificial Intelligence Learning Technologies: Blended Learning, STEM, Computational Thinking and Coding (AAILT 2022); Workshop on Advancements in Applied Machine-learning and Data Analytics (AAMDA 2022); Advances in information Systems and Technologies for Emergency management, risk assessment and mitigation based on the Resilience (ASTER 2022); Advances in Web Based Learning (AWBL 2022); Blockchain and Distributed Ledgers: Technologies and Applications (BDLTA 2022); Bio and Neuro inspired Computing and Applications (BIONCA 2022); Configurational Analysis For Cities (CA Cities 2022); Computational and Applied Mathematics (CAM 2022), Computational and Applied Statistics (CAS 2022); Computational Mathematics, Statistics and Information Management (CMSIM); Computational Optimization and Applications (COA 2022); Computational Astrochemistry (CompAstro 2022); Computational methods for porous geomaterials (CompPor 2022); Computational Approaches for Smart, Conscious Cities (CASCC 2022); Cities, Technologies and Planning (CTP 2022); Digital Sustainability and Circular Economy (DiSCE 2022); Econometrics and Multidimensional Evaluation in Urban Environment (EMEUE 2022); Ethical AI applications for a human-centered cyber society (EthicAI 2022); Future Computing System Technologies and Applications (FiSTA 2022); Geographical Computing and Remote Sensing for Archaeology (GCRSArcheo 2022); Geodesign in Decision Making:

meta planning and collaborative design for sustainable and inclusive development (GDM 2022); Geomatics in Agriculture and Forestry: new advances and perspectives (GeoForAgr 2022); Geographical Analysis, Urban Modeling, Spatial Statistics (Geog-An-Mod 2022); Geomatics for Resource Monitoring and Management (GRMM 2022); International Workshop on Information and Knowledge in the Internet of Things (IKIT 2022); 13th International Symposium on Software Quality (ISSQ 2022); Land Use monitoring for Sustanability (LUMS 2022); Machine Learning for Space and Earth Observation Data (MALSEOD 2022); Building multi-dimensional models for assessing complex environmental systems (MES 2022); MOdels and indicators for assessing and measuring the urban settlement deVElopment in the view of ZERO net land take by 2050 (MOVEto0 2022); Modelling Post-Covid cities (MPCC 2022); Ecosystem Services: nature's contribution to people in practice. Assessment frameworks, models, mapping, and implications (NC2P 2022); New Mobility Choices For Sustainable and Alternative Scenarios (NEMOB 2022); 2nd Workshop on Privacy in the Cloud/Edge/IoT World (PCEIoT 2022); Psycho-Social Analysis of Sustainable Mobility in The Pre- and Post-Pandemic Phase (PSYCHE 2022); Processes, methods and tools towards RESilient cities and cultural heritage prone to SOD and ROD disasters (RES 2022); Scientific Computing Infrastructure (SCI 2022); Socio-Economic and Environmental Models for Land Use Management (SEMLUM 2022); 14th International Symposium on Software Engineering Processes and Applications (SEPA 2022); Ports of the future - smartness and sustainability (SmartPorts 2022); Smart Tourism (SmartTourism 2022); Sustainability Performance Assessment: models, approaches and applications toward interdisciplinary and integrated solutions (SPA 2022); Specifics of smart cities development in Europe (SPEED 2022); Smart and Sustainable Island Communities (SSIC 2022); Theoretical and Computational Chemistryand its Applications (TCCMA 2022); Transport Infrastructures for Smart Cities (TISC 2022); 14th International Workshop on Tools and Techniques in Software Development Process (TTSDP 2022); International Workshop on Urban Form Studies (UForm 2022); Urban Regeneration: Innovative Tools and Evaluation Model (URITEM 2022); International Workshop on Urban Space and Mobilities (USAM 2022); Virtual and Augmented Reality and Applications (VRA 2022); Advanced and Computational Methods for Earth Science Applications (WACM4ES 2022); Advanced Mathematics and Computing Methods in Complex Computational Systems (WAMCM 2022).

Computational Science and Its Applications – ICCSA 2022

Over the last 20 years there have been a large number of technical advances and changes in the field of educational and psychological testing. According to Anne Anastasi, The decade of the 1980's has been a period of unusual advances in ,psychological testing. Technological progress, theoretical sophistication, and increasing pro fessional responsibility are all evident in the fast-moving events in this field (A. Anastasi, Psychological Testing, Sixth Edition. New York: Macmillan, 1988). On the psychometric front, advances in topics such as item response theory, criterion-referenced measurement, generalizability theory,· analy sis of covariance structures, and validity generalization are reshaping the ways that ability and achievement tests are constructed and evaluated, and that test scores are interpreted. But \\Jsychometric advances, as substantial and important as they have been, are only a fraction of the major changes in the field of testing. Today, for example, the computer is radically chang ing the ways in which tests are constructed, administered, and scored. Computers are being used to administer tests "adaptively." That is, the sequence of questions an examinee is administered depends upon his or her performance on earlier administered items in the test. Tests are "adapted" to the ability levels of the examinees who are being assessed. One result is shorter tests with little or no loss in measurement precision. Computers are also being used to store or bank test items. Later, items of interest can be selected, and the computer is used to print copies of the test.

Advances in Educational and Psychological Testing: Theory and Applications

Unlike other forms of adaptive testing, multistage testing (MST) is highly suitable for testing educational achievement because it can be adapted to educational surveys and student testing. This volume provides the first unified source of information on the design, psychometrics, implementation, and operational use of MST. It shows how to apply theoretical statistical tools to testing in novel and useful ways. It also explains how to explicitly tie the assumptions made by each model to observable (or at least inferable) data conditions.

Computerized Multistage Testing

The Programme for International Student Assessment (PISA) is an important part of the OECD's Indicator Programme. It collects data and provides comparative indicators of education systems in OECD member and partner countries. PISA provides datasets of outstanding quality regarding samples, instruments and analyses. In addition to its important function for educational monitoring, the PISA datasets are the basis of a wide range of secondary analyses from a number of different scientific perspectives and disciplines. The aim of this book is to make some of the outstanding PISA related research results available for a wider audience. Specifically four research areas will be focused: (1) Content related research; (2) Methodological research; (3) Context related research; (4) Research on trends in PISA. Each part of the book is devoted to one of these areas and will start with an introduction from a leading expert in the field followed by chapters covering research conducted in this field.

Research on PISA

The focus of this book is computer based assessment of the receptive skills.

Issues in Computer-Adaptive Testing of Reading Proficiency

Quantitative methodology is a highly specialized field, and as with any highly specialized field, working through idiosyncratic language can be very difficult made even more so when concepts are conveyed in the language of mathematics and statistics. The Sage Handbook of Quantitative Methodology for the Social Sciences was conceived as a way of introducing applied statisticians, empirical researchers, and graduate students to the broad array of state-of-the-art quantitative methodologies in the social sciences. The contributing authors of the Handbook were asked to write about their areas of expertise in a way that would convey to the reader the utility of their respective methodologies. Relevance to real-world problems in the social sciences is an essential ingredient of each chapter. The Handbook consists of six sections comprising twenty-five chapters, from topics in scaling and measurement, to advances in statistical modelling methodologies, and finally to broad philosophical themes that transcend many of the quantitative methodologies covered in this handbook.

The SAGE Handbook of Quantitative Methodology for the Social Sciences

The standard approach to cognitive development most frequently consists of cross-sectional studies comparing different ages and groups while restricted to a single task. The necessity to focus on the individual in an idiographic perspective, rather than on the task or the variable, has been repeatedly emphasized, most recently in several very important papers by Nesselroade and Molenaar. Variability has also emerged as a crucial characteristic. Moreover, understanding the developmental construction of a given cognitive achievement is imperative to understanding cognitive functioning in adulthood. The general objective of this book is to focus on the individual by studying intraindividual and interindividual variability in various cognitive tasks, that is, intraindividual variability across items of a given task (“inconsistency”), across various cognitive tasks (“dispersion”), and/or across years (“intraindividual change”), and of course, on interindividual differences in intraindividual variability. This book presents empirical studies that have been conducted by research groups in Europe and in North America, prominent in the field of variability and development or methodology. The 26 authors/co-authors include senior authors such as Lautrey, Schmiedek, Dauvier, van der Maas, Ghisletta, Stawski, MacDonald, and de Ribaupierre.

Cognitive Development and Individual Variability

The purpose of this book is to bring researchers and practitioners up-to-date on the growing body of research on Automatic Item Generation by organizing in one volume what is currently known about this research area.

Resources in Education

The goal of this guide and manual is to provide a practical and brief overview of the theory on computerized adaptive testing (CAT) and multistage testing (MST) and to illustrate the methodologies and applications using R open source language and several data examples. Implementation relies on the R packages catR and mstR that have been already or are being developed by the first author (with the team) and that include some of the newest research algorithms on the topic. The book covers many topics along with the R-code: the basics of R, theoretical overview of CAT and MST, CAT designs, CAT assembly methodologies, CAT simulations, catR package, CAT applications, MST

designs, IRT-based MST methodologies, tree-based MST methodologies, mstR package, and MST applications. CAT has been used in many large-scale assessments over recent decades, and MST has become very popular in recent years. R open source language also has become one of the most useful tools for applications in almost all fields, including business and education. Though very useful and popular, R is a difficult language to learn, with a steep learning curve. Given the obvious need for but with the complex implementation of CAT and MST, it is very difficult for users to simulate or implement CAT and MST. Until this manual, there has been no book for users to design and use CAT and MST easily and without expense; i.e., by using the free R software. All examples and illustrations are generated using predefined scripts in R language, available for free download from the book's website.

Automatic Item Generation

A review book containing a comprehensive simulated NCLEX-RN exam with answers and rationales. Also included are test-taking tips and strategies, a section on high-yield facts, objective reviews of exam preparation books and courses, and a computer disk with simulated exam.

Designing Optimal Item Pools for Computerized Adaptive Tests with Exposure Controls

This new text provides the most current coverage of measurement and psychometrics in a single volume. Authors W. Holmes Finch and Brian F. French first review the basics of psychometrics and measurement, before moving on to more complex topics such as equating and scaling, item response theory, standard setting, and computer adaptive testing. Also included are discussions of cutting-edge topics utilized by practitioners in the field, such as automated test development, game-based assessment, and automated test scoring. This book is ideal for use as a primary text for graduate-level psychometrics/measurement courses, as well as for researchers in need of a broad resource for understanding test theory. Features: "How it Works" and "Psychometrics in the Real World" boxes break down important concepts through worked examples, and show how theory can be applied to practice. End-of-chapter exercises allow students to test their comprehension of the material, while suggested readings and website links provide resources for further investigation. A collection of free online resources include the full output from R, SPSS, and Excel for each of the analyses conducted in the book, as well as additional exercises, sample homework assignments, answer keys, and PowerPoint lecture slides.

Computerized Adaptive and Multistage Testing with R

Sponsored by Division 15 of APA, the second edition of this groundbreaking book has been expanded to 41 chapters that provide unparalleled coverage of this far-ranging field. Internationally recognized scholars contribute up-to-date reviews and critical syntheses of the following areas: foundations and the future of educational psychology, learners' development, individual differences, cognition, motivation, content area teaching, socio-cultural perspectives on teaching and learning, teachers and teaching, instructional design, teacher assessment, and modern perspectives on research methodologies, data, and data analysis. New chapters cover topics such as adult development, self-regulation, changes in knowledge and beliefs, and writing. Expanded treatment has been given to cognition, motivation, and new methodologies for gathering and analyzing data. The Handbook of Educational Psychology, Second Editionprovides an indispensable reference volume for scholars, teacher educators, in-service practitioners, policy makers and the academic libraries serving these audiences. It is also appropriate for graduate level courses devoted to the study of educational psychology. s, teacher educators, in-service practitioners, policy makers and the academic libraries serving these audiences. It is also appropriate for graduate level courses devoted to the study of educational psychology.

First Aid for the NCLEX-RN Computerized Adaptive Testing

The largest work ever published in the social and behavioural sciences. It contains 4000 signed articles, 15 million words of text, 90,000 bibliographic references and 150 biographical entries.

Educational and Psychological Measurement

Quality of life is an important outcome when treating a cancer patient. Research is vast on the role of quality of life on patients' general wellbeing, responsiveness to treatment, and even mortality. On the other hand, there are several methodological considerations when planning to measure and assess

quality of life in cancer patients. This handbook – with authorship that is diverse in terms of perspectives, countries, and fields – aims to fill a gap in the available literature and responds to a number of questions in its 26 chapters: What is quality of life and health-related quality of life and why are they important? How is quality of life assessed? What are the theoretical and methodological considerations when using quality of life outcomes in cancer research? How is quality of life useful in routine clinical care? How is quality of life impacting different cancer populations in terms of site of the cancer, age, gender, and context? Handbook of Quality of Life in Cancer is a learning and consulting tool that can be used by a diverse audience. It is an essential resource for researchers who wish to use quality of life assessment tools in clinical trials or other types of studies; clinicians who want to develop their understanding of how they can utilize quality of life and how it is important for the patients they care for; and commissioners who wish to see why quality of life may impact population health and health system costs. Students in diverse fields of study (medicine, nursing, psychology, social work, medical sociology, population health, epidemiology, and medical statistics, among others) also would benefit from using the handbook for their studies and for their continuing professional development.

Handbook of Educational Psychology

This open access book presents a large number of innovations in the world of operational testing. It brings together different but related areas and provides insight in their possibilities, their advantages and drawbacks. The book not only addresses improvements in the quality of educational measurement, innovations in (inter)national large scale assessments, but also several advances in psychometrics and improvements in computerized adaptive testing, and it also offers examples on the impact of new technology in assessment. Due to its nature, the book will appeal to a broad audience within the educational measurement community. It contributes to both theoretical knowledge and also pays attention to practical implementation of innovations in testing technology. This work was published by Saint Philip Street Press pursuant to a Creative Commons license permitting commercial use. All rights not granted by the work's license are retained by the author or authors.

Proceedings of the 1977 Computerized Adaptive Testing Conference Held at the University of Minnesota, July 19-22, 1977

This book introduces computer-based testing, addressing both nontechnical and technical considerations. The material is oriented toward practitioners and graduate students. The practical emphasis will be useful to measurement professionals who are or will be responsible for implementing a computerized testing program. The instructional information is also designed to be suitable for a one-semester graduate course in computerized testing in an educational measurement or quantitative methods program. While certain theoretical concepts are addressed, the focus of the book is on the applied nature of computerized testing. For this reason, the materials include such features as example applications, figures, and plots to illustrate critical points in the discussions. A wide range ofnontechnical issues need to be considered in implementing a computer-based testing program. Separate chapters are provided on test administration and development issues, examinee issues, software issues, and innovative item types. Test administration and delivery issues include the location of exam administration, selection of hardware and software, security considerations, scheduling of administration frequency and time limits, cost implications, and program support as well as approaches for addressing reliability, validity, comparability, and data analysis. Examinee issues include the influence ofexaminees' reactions to adaptive testing, the effect ofcomputer based task constraints, and the impact of examinees' prior computer experience. Software issues include usability studies and software evaluation as tools in selecting and developing appropriate software, based on the test program needs.

International Encyclopedia of the Social & Behavioral Sciences

Wim van der Linden was just given a lifetime achievement award by the National Council on Measurement in Education. There is no one more prominent in the area of educational testing. There are hundreds of computer-based credentialing exams in areas such as accounting, real estate, nursing, and securities, as well as the well-known admissions exams for college, graduate school, medical school, and law school - there is great need on the theory of testing. This book presents the statistical theory and practice behind constructing good tests e.g., how is the first test item selected, how are the next items selected, and when do you have enough items.

Cognitive Diagnostic Models: Methods for Practical Applications

There is an increasing need to rein in the cost of scientific study without sacrificing accuracy in statistical inference. Optimal design is the judicious allocation of resources to achieve the objectives of studies using minimal cost via careful statistical planning. Researchers and practitioners in various fields of applied science are now beginning to recognize the advantages and potential of optimal experimental design. Applied Optimal Designs is the first book to catalogue the application of optimal design to real problems, documenting its widespread use across disciplines as diverse as drug development, education and ground water modelling. Includes contributions covering: Bayesian design for measuring cerebral blood-flow Optimal designs for biological models Computer adaptive testing Ground water modelling Epidemiological studies and pharmacological models Applied Optimal Designs bridges the gap between theory and practice, drawing together a selection of incisive articles from reputed collaborators. Broad in scope and inter-disciplinary in appeal, this book highlights the variety of opportunities available through the use of optimal design. The wide range of applications presented here should appeal to statisticians working with optimal designs, and to practitioners new to the theory and concepts involved.

Handbook of Quality of Life in Cancer

No topic is more central to innovation and current practice in testing and assessment today than computers and the Internet. This timely publication highlights four main themes that define current issues, technical advances and applications of computer-based testing: Advances in computer-based testing -- new test designs, item selection algorithms, exposure control issues and methods, and new tests that capitalize on the power of computer technology. Operational issues -- systems design, test security, and legal and ethical matters. New and improved uses -- for tests in employment and credentialing. The future of computer-based testing -- identifying potential issues, developments, major advances and problems to overcome. Written by internationally recognized contributors, each chapter focuses on issues of control, quality, security and technology. These issues provide the basic structure for the International Test Commission's new Guidelines on Computer-Based Testing and Testing on the Internet. The contributions to this book have played a key role in the development of these guidelines. Computer-Based Testing and the Internet is a comprehensive guide for all professionals, academics and practitioners working in the fields of education, credentialing, personnel testing and organizational assessment. It will also be of value to students developing expertise in these areas.

Development and Validation of a Computerized Adaptive EFL Test

This book introduces theories and practices for using assessment data to enhance learning and instruction. Topics include reshaping the homework review process, iterative learning engineering, learning progressions, learning maps, score report designing, the use of psychosocial data, and the combination of adaptive testing and adaptive learning. In addition, studies proposing new methods and strategies, technical details about the collection and maintenance of process data, and examples illustrating proposed methods and software are included. Chapters 1, 4, 6, 8, and 9 discuss how to make valid interpretations of results and achieve more efficient instructions from various sources of data. Chapters 3 and 7 propose and evaluate new methods to promote students’ learning by using evidence-based iterative learning engineering and supporting the teachers’ use of assessment data, respectively. Chapter 2 provides technical details on the collection, storage, and security protection of process data. Chapter 5 introduces software for automating some aspects of developmental education and the use of predictive modeling. Chapter 10 describes the barriers to using psychosocial data for formative assessment purposes. Chapter 11 describes a conceptual framework for adaptive learning and testing and gives an example of a functional learning and assessment system. In summary, the book includes comprehensive perspectives of the recent development and challenges of using test data for formative assessment purposes. The chapters provide innovative theoretical frameworks, new perspectives on the use of data with technology, and how to build new methods based on existing theories. This book is a useful resource to researchers who are interested in using data and technology to inform decision making, facilitate instructional utility, and achieve better learning outcomes.

A Method to Determine Targets for Multi-stage Adaptive Tests

Fairness and ethicality have been at the center of the debates on the appropriate use of educational tests since the 1960s. Particularly in high-stakes contexts, it is clear that fairness should be a major concern to both the test developers, and to those being tested, given that the fairness of a test is so intertwined with its validity. Fairness Issues in Educational Assessment aims to shed more light on the

issue and bring to sight some of the ways in which test fairness can be addressed. The contributions, written by some of the most prominent figures in educational assessment, address both theoretical and practical aspects of test fairness. The wealth of ideas presented here will be valuable to novice researchers and help them appreciate both the joy and complexity of conducting fair educational measurement. This book was originally published as a special issue of Educational Research and Evaluation.

Theoretical and Practical Advances in Computer-based Educational Measurement

Introduction to measurement -- The one-parameter model -- Joint maximum likelihood parameter estimation -- Marginal maximum likelihood parameter estimation -- The two-parameter model -- The three-parameter model -- Rasch models for ordered polytomous data -- Non-Rasch models for ordered polytomous data -- Models for nominal polytomous data -- Models for multidimensional data -- Linking and equating -- Differential item functioning -- Multilevel IRT models.

Practical Considerations in Computer-Based Testing

Since the mid-80s several laboratories around the world have been developing techniques for the operational use of tests derived from item-generation. According to the experts, the major thrust of test development in the next decade will be the harnessing of item generation technology to the production of computer developed tests. This is expected to revolutionize the way in which tests are constructed and delivered. This book is a compilation of the papers presented at a symposium held at ETS in Princeton, attended by the world's foremost experts in item-generation theory and practice. Its goal is to present the major applications of cognitive principles in the construction of ability, aptitude, and achievement tests. It is an intellectual contribution to test development that is unique, with great potential for changing the ways tests are generated. The intended market includes professional educators and psychologists interested in test generation.

Linear Models for Optimal Test Design

First thorough treatment of multidimensional item response theory Description of methods is supported by numerous practical examples Describes procedures for multidimensional computerized adaptive testing

Applied Optimal Designs

"The Encyclopedia of Social Measurement captures the data, techniques, theories, designs, applications, histories, and implications of assigning numerical values to social phenomena. Responding to growing demands for transdisciplinary descriptions of quantitative and qualitative techniques, measurement, sampling, and statistical methods, it will increase the proficiency of everyone who gathers and analyzes data. Covering all core social science disciplines, the 300+ articles of the Encyclopedia of Social Measurement not only present a comprehensive summary of observational frameworks and mathematical models, but also offer tools, background information, qualitative methods, and guidelines for structuring the research process. Articles include examples and applications of research strategies and techniques, highlighting multidisciplinary options for observing social phenomena. The alphabetical arrangement of the articles, their glossaries and cross-references, and the volumes' detailed index will encourage exploration across the social sciences. Descriptions of important data sets and case studies will help readers understand resources they can often instantly access. Also available online via ScienceDirect -- featuring extensive browsing, searching, and internal cross-referencing between articles in the work, plus dynamic linking to journal articles and abstract databases, making navigation flexible and easy. For more information, pricing options and availability visit www.info.sciencedirect.com. * Introduces readers to the advantages and potential of specific techniques and suggests additional sources that readers can then consult to learn more * Conveys a range of basic to complex research issues in sufficient detail to explain even the most complicated statistical technique. Readers are provided with references for further information * Eleven substantive sections delineate social sciences and the research processes they follow to measure and provide new knowledge on a wide range of topics * Authors are prominent scholars and methodologists from all social science fields * Within each of the sections important components of quantitative and qualitative research methods are dissected and illustrated with examples from diverse fields of study * Actual research experiences provide useful examples." -- Publisher.

Computer-Based Testing and the Internet

The focus of this book is computer based assessment of the receptive skills.

Enhancing Effective Instruction and Learning Using Assessment Data

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