

Detecting Overlapping Temporal Community Structure In Time

This book redefines community discovery in the new world of Online Social Networks and Web 2.0 applications, through real-world problems and applications in the context of the Web, pointing out the current and future challenges of the field. Particular emphasis is placed on the issues of community representation, efficiency and scalability, detection of communities in hypergraphs, such as multi-mode and multi-relational networks, characterization of social media communities and online privacy aspects of online communities. User Community Discovery is for computer scientists, data scientists, social scientists and complex systems researchers, as well as students within these disciplines, while the connections to real-world problem settings and applications makes the book appealing for engineers and practitioners in the industry, in particular those interested in the highly attractive fields of data science and big data analytics.

This book features a wide spectrum of the latest computer science research relating to cyber warfare, including military and policy dimensions. It is the first

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book to explore the scientific foundation of cyber warfare and features research from the areas of artificial intelligence, game theory, programming languages, graph theory and more. The high-level approach and emphasis on scientific rigor provides insights on ways to improve cyber warfare defense worldwide. Cyber Warfare: Building the Scientific Foundation targets researchers and practitioners working in cyber security, especially government employees or contractors. Advanced-level students in computer science and electrical engineering with an interest in security will also find this content valuable as a secondary textbook or reference.

Chapter "Heavy-tailed Kernels Reveal a Finer Cluster Structure in t-SNE Visualisations" is available open access under a Creative Commons Attribution 4.0 International License via link.springer.com.

This book presents the latest research advances in complex network structure analytics based on computational intelligence (CI) approaches, particularly evolutionary optimization. Most if not all network issues are actually optimization problems, which are mostly NP-hard and challenge conventional optimization techniques. To effectively and efficiently solve these hard optimization problems, CI based network structure analytics offer significant advantages over conventional network analytics techniques. Meanwhile, using CI techniques may

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facilitate smart decision making by providing multiple options to choose from, while conventional methods can only offer a decision maker a single suggestion. In addition, CI based network structure analytics can greatly facilitate network modeling and analysis. And employing CI techniques to resolve network issues is likely to inspire other fields of study such as recommender systems, system biology, etc., which will in turn expand CI's scope and applications. As a comprehensive text, the book covers a range of key topics, including network community discovery, evolutionary optimization, network structure balance analytics, network robustness analytics, community-based personalized recommendation, influence maximization, and biological network alignment. Offering a rich blend of theory and practice, the book is suitable for students, researchers and practitioners interested in network analytics and computational intelligence, both as a textbook and as a reference work.

This book focuses on the theoretical side of temporal network research and gives an overview of the state of the art in the field. Curated by two pioneers in the field who have helped to shape it, the book contains contributions from many leading researchers. Temporal networks fill the border area between network science and time-series analysis and are relevant for the modeling of epidemics, optimization of transportation and logistics, as well as understanding biological

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phenomena. Network theory has proven, over the past 20 years to be one of the most powerful tools for the study and analysis of complex systems. Temporal network theory is perhaps the most recent significant development in the field in recent years, with direct applications to many of the "big data" sets. This monograph will appeal to students, researchers and professionals alike interested in theory and temporal networks, a field that has grown tremendously over the last decade.

This two-volume set, LNAI 10234 and 10235, constitutes the thoroughly refereed proceedings of the 21st Pacific-Asia Conference on Advances in Knowledge Discovery and Data Mining, PAKDD 2017, held in Jeju, South Korea, in May 2017. The 129 full papers were carefully reviewed and selected from 458 submissions. They are organized in topical sections named: classification and deep learning; social network and graph mining; privacy-preserving mining and security/risk applications; spatio-temporal and sequential data mining; clustering and anomaly detection; recommender system; feature selection; text and opinion mining; clustering and matrix factorization; dynamic, stream data mining; novel models and algorithms; behavioral data mining; graph clustering and community detection; dimensionality reduction.

This two-volume set (CCIS 951 and CCIS 952) constitutes the proceedings of the

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13th International Conference on Bio-inspired Computing: Theories and Applications, BIC-TA 2018, held in Beijing, China, in November 2018. The 88 full papers presented in both volumes were selected from 206 submissions. The papers deal with studies abstracting computing ideas such as data structures, operations with data, ways to control operations, computing models from living phenomena or biological systems such as evolution, cells, neural networks, immune systems, swarm intelligence.

This edited book presents contributions from three different areas: cloud computing, digital mess and business algorithms on a single platform, i.e. Digital Business. The book is divided into four sections: (i) Digital Business Transformation, (ii) Cloud Computing, (iii) IOT & Mobility, and (iv) Information Management & Social Media, which are part of a holistic approach to information management and connecting the value chains of businesses to derive more throughput in the entire business ecosystem. Digital business is a niche area of computer science and business management, and its dimension is vast – it includes technologies such as cloud computing, Internet of Things, mobile platforms, big data applied in areas like ERP, data mining and business intelligence. Digital technologies have also challenged existing business models and will continue to do so. One of the key driving forces is the capacity of

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innovation and the commercialization of information and communication technologies. Providing insights into the new paradigm of digital business, the book is a valuable resource for research scholars, academics and professionals. Illustrated throughout in full colour, this pioneering text is the only book you need for an introduction to network science.

This book sheds light on the challenges facing social media in combating malicious accounts, and aims to introduce current practices to address the challenges. It further provides an in-depth investigation regarding characteristics of “Pathogenic Social Media (PSM),” by focusing on how they differ from other social bots (e.g., trolls, sybils and cyborgs) and normal users as well as how PSMs communicate to achieve their malicious goals. This book leverages sophisticated data mining and machine learning techniques for early identification of PSMs, using the relevant information produced by these bad actors. It also presents proactive intelligence with a multidisciplinary approach that combines machine learning, data mining, causality analysis and social network analysis, providing defenders with the ability to detect these actors that are more likely to form malicious campaigns and spread harmful disinformation. Over the past years, social media has played a major role in massive dissemination of misinformation online. Political events and public opinion on the Web have been allegedly manipulated by several forms of accounts including “Pathogenic Social Media (PSM)” accounts (e.g., ISIS supporters and fake news writers). PSMs are key users in spreading misinformation on social media - in viral proportions. Early identification of PSMs is thus of utmost importance for social media authorities in an effort toward stopping their

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propaganda. The burden falls to automatic approaches that can identify these accounts shortly after they began their harmful activities. Researchers and advanced-level students studying and working in cybersecurity, data mining, machine learning, social network analysis and sociology will find this book useful. Practitioners of proactive cyber threat intelligence and social media authorities will also find this book interesting and insightful, as it presents an important and emerging type of threat intelligence facing social media and the general public. This edited volume offers a clear in-depth overview of research covering a variety of issues in social search and recommendation systems. Within the broader context of social network analysis it focuses on important and up-coming topics such as real-time event data collection, frequent-sharing pattern mining, improvement of computer-mediated communication, social tagging information, search system personalization, new detection mechanisms for the identification of online user groups, and many more. The twelve contributed chapters are extended versions of conference papers as well as completely new invited chapters in the field of social search and recommendation systems. This first-of-its kind survey of current methods will be of interest to researchers from both academia and industry working in the field of social networks.

This book constitutes the proceedings of the 4th International Conference on Social Informatics, SocInfo 2012, held in Lausanne, Switzerland, in December 2012. The 21 full papers, 18 short papers included in this volume were carefully reviewed and selected from 61 submissions. The papers are organized in topical sections named: social choice mechanisms in the e-society, computational models of social phenomena, social simulation, web mining and its social interpretations, algorithms and protocols inspired by human societies, socio-economic

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systems and applications, trust, privacy, risk and security in social contexts.

This book constitutes the proceedings of the 21st International Conference on Web Information Systems Engineering, WISE 2020, held in Amsterdam, The Netherlands, in October 2020. The 81 full papers presented were carefully reviewed and selected from 190 submissions. The papers are organized in the following topical sections: Part I: network embedding; graph neural network; social network; graph query; knowledge graph and entity linkage; spatial temporal data analysis; and service computing and cloud computing Part II: information extraction; text mining; security and privacy; recommender system; database system and workflow; and data mining and applications

The 7 papers presented in this book are revised and significantly extended versions of papers submitted to three related workshops: 6th International Workshop on Mining Ubiquitous and Social Environments, MUSE 2015, held in Porto, Portugal, September 2015, in conjunction with the 6th European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases, ECML-PKDD 2015; 6th International Workshop on Modeling Social Media, MSM 2015, held in Florence, Italy, May 2015, in conjunction with the 24th International World Wide Web Conference, WWW 2015; 7th International Workshop on Modeling Social Media, MSM 2016, Montreal, QC, Canada, April 2016, in conjunction with the 25th International World Wide Web Conference, WWW 2016.

This three-volume set, LNAI 10937, 10938, and 10939, constitutes the thoroughly refereed proceedings of the 22nd Pacific-Asia Conference on Advances in Knowledge Discovery and Data Mining, PAKDD 2018, held in Melbourne, VIC, Australia, in June 2018. The 164 full papers were carefully reviewed and selected from 592 submissions. The volumes present

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papers focusing on new ideas, original research results and practical development experiences from all KDD related areas, including data mining, data warehousing, machine learning, artificial intelligence, databases, statistics, knowledge engineering, visualization, decision-making systems and the emerging applications.

The three volume proceedings LNAI 11051 – 11053 constitutes the refereed proceedings of the European Conference on Machine Learning and Knowledge Discovery in Databases, ECML PKDD 2018, held in Dublin, Ireland, in September 2018. The total of 131 regular papers presented in part I and part II was carefully reviewed and selected from 535 submissions; there are 52 papers in the applied data science, nectar and demo track. The contributions were organized in topical sections named as follows: Part I: adversarial learning; anomaly and outlier detection; applications; classification; clustering and unsupervised learning; deep learningensemble methods; and evaluation. Part II: graphs; kernel methods; learning paradigms; matrix and tensor analysis; online and active learning; pattern and sequence mining; probabilistic models and statistical methods; recommender systems; and transfer learning. Part III: ADS data science applications; ADS e-commerce; ADS engineering and design; ADS financial and security; ADS health; ADS sensing and positioning; nectar track; and demo track.

The main interest of this research has been in understanding and characterizing large networks of human interactions as continuously changing objects. In fact, although many real social networks are dynamic networks whose elements and properties continuously change over time, traditional approaches to social network analysis are

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essentially static, thus neglecting all temporal aspects. Specifically, we have investigated the role that temporal patterns of human interaction play in three main fields of social network analysis and data mining: characterization of time (or attention) allocation in social networks, prediction of link decay/persistence, and information spreading. In order to address this we analyzed large anonymized data sets of phone call communication traces over long periods of time. Access to these observations was granted by Telefonica Research, Spain. The findings that emerge from our research indicate that the observed heterogeneities and correlations of human temporal patterns of interaction significantly affect the traditional view of social networks, shifting from a very steady to a highly complex entity. Since structure and dynamics are tightly coupled, they cannot be disentangled in the analysis and modeling of human behavior, though traditional models seek to do so. Our results impact not only the way in which social network are traditionally characterized, but more importantly also the understanding and modeling phenomena such as group formation, spread of epidemics, and the dissemination of ideas, opinions and information.

This two-volume set LNCS 11446 and LNCS 11447 constitutes the refereed proceedings of the 24th International Conference on Database Systems for Advanced Applications, DASFAA 2019, held in Chiang Mai, Thailand, in April 2019. The 92 full papers and 64 short papers were carefully selected from a total of 501 submissions. In addition, 13 demo papers and 6 tutorial papers are included. The full papers are

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organized in the following topics: big data; clustering and classification; crowdsourcing; data integration; embedding; graphs; knowledge graph; machine learning; privacy and graph; recommendation; social network; spatial; and spatio-temporal. The short papers, demo papers, and tutorial papers can be found in the volume LNCS 11448, which also includes the workshops of DASFAA 2019.

This book focuses on the theory and application of interdependent networks. The contributors consider the influential networks including power and energy networks, transportation networks, and social networks. The first part of the book provides the next generation sustainability framework as well as a comprehensive introduction of smart cities with special emphasis on energy, communication, data analytics and transportation. The second part offers solutions to performance and security challenges of developing interdependent networks in terms of networked control systems, scalable computation platforms, and dynamic social networks. The third part examines the role of electric vehicles in the future of sustainable interdependent networks. The fourth and last part of this volume addresses the promises of control and management techniques for the future power grids.

This book constitutes the refereed post-conference proceedings of the First International Workshop on Mobility Analytics for Spatio-Temporal and Social Data, MATES 2017, held in Munich, Germany, in September 2017. The 6 revised full papers and 2 short papers included in this volume were carefully reviewed and selected from

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13 submissions. Also included are two keynote speeches. The papers intend to raise awareness of real-world problems in critical domains which require novel data management solutions. They are organized in two thematic sections: social network analytics and applications, and spatio-temporal mobility analytics.

The two-volume set LNCS 10569 and LNCS 10570 constitutes the proceedings of the 18th International Conference on Web Information Systems Engineering, WISE 2017, held in Puschino, Russia, in October 2017. The 49 full papers and 24 short papers presented were carefully reviewed and selected from 195 submissions. The papers cover a wide range of topics such as microblog data analysis, social network data analysis, data mining, pattern mining, event detection, cloud computing, query processing, spatial and temporal data, graph theory, crowdsourcing and crowdsensing, web data model, language processing and web protocols, web-based applications, data storage and generator, security and privacy, sentiment analysis, and recommender systems.

The four volume set LNCS 9947, LNCS 9948, LNCS 9949, and LNCS 9950 constitutes the proceedings of the 23rd International Conference on Neural Information Processing, ICONIP 2016, held in Kyoto, Japan, in October 2016. The 296 full papers presented were carefully reviewed and selected from 431 submissions. The 4 volumes are organized in topical sections on deep and reinforcement learning; big data analysis; neural data analysis; robotics and control; bio-inspired/energy efficient information

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processing; whole brain architecture; neurodynamics; bioinformatics; biomedical engineering; data mining and cybersecurity workshop; machine learning; neuromorphic hardware; sensory perception; pattern recognition; social networks; brain-machine interface; computer vision; time series analysis; data-driven approach for extracting latent features; topological and graph based clustering methods; computational intelligence; data mining; deep neural networks; computational and cognitive neurosciences; theory and algorithms.

This book focuses on the new possibilities and approaches to social modeling currently being made possible by an unprecedented variety of datasets generated by our interactions with modern technologies. This area has witnessed a veritable explosion of activity over the last few years, yielding many interesting and useful results. Our aim is to provide an overview of the state of the art in this area of research, merging an extremely heterogeneous array of datasets and models. *Social Phenomena: From Data Analysis to Models* is divided into two parts. Part I deals with modeling social behavior under normal conditions: How we live, travel, collaborate and interact with each other in our daily lives. Part II deals with societal behavior under exceptional conditions: Protests, armed insurgencies, terrorist attacks, and reactions to infectious diseases. This book offers an overview of one of the most fertile emerging fields bringing together practitioners from scientific communities as diverse as social sciences, physics and computer science. We hope to not only provide an unifying framework to understand

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and characterize social phenomena, but also to help foster the dialogue between researchers working on similar problems from different fields and perspectives. This book constitutes the proceedings of the 10th International and Interdisciplinary Conference on Modeling and Using Context, CONTEXT 2017, held in Paris, France, in June 2017. The 26 full papers and 15 short papers presented were carefully reviewed and selected from 88 submissions. The papers feature research in a wide range of disciplines related to issues of context and contextual knowledge and discuss commonalities across and differences between the disciplines' approaches to the study of context. They are organized in the following topical sections: context in representation; context modeling of human activities; context in communication; context awareness; and various specific topics.

D2D-based proximity service is a very hot topic with great commercial potential from an application standpoint. Unlike existing books which focus on D2D communications technologies, this book fills a gap by summarizing and analyzing the latest applications and research results in academic, industrial fields, and standardization. The authors present the architecture, fundamental issues, and applications in a D2D networking environment from both application and interdisciplinary points of view.

Network science offers a powerful language to represent and study complex systems composed of interacting elements — from the Internet to social and biological systems. *A Guide to Temporal Networks* presents recent theoretical and modelling progress in the emerging field of temporally varying networks and provides connections between the different areas of

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knowledge required to address this multi-disciplinary subject. After an introduction to key concepts on networks and stochastic dynamics, the authors guide the reader through a coherent selection of mathematical and computational tools for network dynamics. Perfect for students and professionals, this book is a gateway to an active field of research developing between the disciplines of applied mathematics, physics and computer science, with applications in others including social sciences, neuroscience and biology. This second edition extensively expands upon the coverage of the first edition as the authors expertly present recent theoretical and modelling progress in the emerging field of temporal networks, providing the keys to (and connections between) the different areas of knowledge required to address this multi-disciplinary problem.

This book is devoted to recent progress in social network analysis with a high focus on community detection and evolution. The eleven chapters cover the identification of cohesive groups, core components and key players either in static or dynamic networks of different kinds and levels of heterogeneity. Other important topics in social network analysis such as influential detection and maximization, information propagation, user behavior analysis, as well as network modeling and visualization are also presented. Many studies are validated through real social networks such as Twitter. This edited work will appeal to researchers, practitioners and students interested in the latest developments of social network analysis.

This book offers a collection of high-quality, peer-reviewed research papers presented at the International Conference on Intelligent Computing, Communication and Devices (ICCD 2017), discussing all dimensions of intelligent sciences – intelligent computing, intelligent communication, and intelligent devices. Intelligent computing addresses areas such as

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intelligent and distributed computing, intelligent grid and cloud computing, internet of things, soft computing and engineering applications, data mining and knowledge discovery, semantic and web technology, hybrid systems, agent computing, bioinformatics, and recommendation systems. Intelligent communication is concerned with communication and network technologies, such as mobile broadband and all optical networks that are the key to groundbreaking inventions of intelligent communication technologies. It includes communication hardware, software and networked intelligence, mobile technologies, machine-to-machine communication networks, speech and natural language processing, routing techniques and network analytics, wireless ad hoc and sensor networks, communications and information security, signal, image and video processing, network management, and traffic engineering. Lastly, intelligent devices are any equipment, instruments, or machines that have their own computing capability. As computing technology becomes more advanced and less expensive, it can be incorporated an increasing number of devices of all kinds. This area covers such as embedded systems, radiofrequency identification (RFID), radiofrequency microelectromechanical system (RF MEMS), very-large-scale integration (VLSI) design and electronic devices, analog and mixed-signal integrated circuit (IC) design and testing, microelectromechanical system (MEMS) and microsystems, solar cells and photonics, nanodevices, single electron and spintronics devices, space electronics, and intelligent robotics.

Recommender systems use information filtering to predict user preferences. They are becoming a vital part of e-business and are used in a wide variety of industries, ranging from entertainment and social networking to information technology, tourism, education, agriculture,

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healthcare, manufacturing, and retail. Recommender Systems: Algorithms and Applications dives into the theoretical underpinnings of these systems and looks at how this theory is applied and implemented in actual systems. The book examines several classes of recommendation algorithms, including Machine learning algorithms Community detection algorithms Filtering algorithms Various efficient and robust product recommender systems using machine learning algorithms are helpful in filtering and exploring unseen data by users for better prediction and extrapolation of decisions. These are providing a wider range of solutions to such challenges as imbalanced data set problems, cold-start problems, and long tail problems. This book also looks at fundamental ontological positions that form the foundations of recommender systems and explain why certain recommendations are predicted over others. Techniques and approaches for developing recommender systems are also investigated. These can help with implementing algorithms as systems and include A latent-factor technique for model-based filtering systems Collaborative filtering approaches Content-based approaches Finally, this book examines actual systems for social networking, recommending consumer products, and predicting risk in software engineering projects. Social network analysis increasingly bridges the discovery of patterns in diverse areas of study as more data becomes available and complex. Yet the construction of huge networks from large data often requires entirely different approaches for analysis including; graph theory, statistics, machine learning and data mining. This work covers frontier studies on social network analysis and mining from different perspectives such as social network sites, financial data, e-mails, forums, academic research funds, XML technology, blog content, community detection and clique finding, prediction of user's- behavior, privacy in social network analysis,

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mobility from spatio-temporal point of view, agent technology and political parties in parliament. These topics will be of interest to researchers and practitioners from different disciplines including, but not limited to, social sciences and engineering.

The recent emergence and prevalence of social network applications, sensor equipped mobile devices, and the availability of large amounts of geo-referenced data have enabled the analysis of new context dimensions that involve individual, social, and urban context. Creating Personal, Social, and Urban Awareness through Pervasive Computing provides an overview of the theories, techniques, and practical applications related to the three dimensions of context awareness. Through the exploration of emerging research trends of pervasive computing, this book is beneficial to professors, students, researchers, and developers interested this latest development in the field of context-awareness and pervasive computing.

Öffentliche Kommunikationsprozesse sind im Zeitalter der Digitalisierung von einer wachsenden Dynamik geprägt. Dies stellt die Kommunikationsforschung vor erhebliche methodische Herausforderungen. Die Methodenentwicklung steckt noch in den Kinderschuhen, wenn es darum geht, die eng getakteten und komplexen Interaktionsmuster menschlicher Akteure und technischer Strukturen der digitalen Öffentlichkeit adäquat abzubilden. Empirische Studien sind dazu gezwungen, die Komplexität der Dynamiken in der sozialen Realität zu reduzieren, um diese fassbar zu machen. Damit geht jedoch stets die Gefahr einher, entscheidende Aspekte zu übersehen. Die in diesem Band versammelten Beiträge widmen sich diesem Dilemma am Beispiel verschiedener Anwendungsfelder, von der Kommunikator- und Medieninhaltsforschung bis zur Rezeptions- und Wirkungsforschung. Die Beiträge liegen auf verschiedenen Stufen des Forschungsprozesses und befassen sich mit

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einer Vielzahl methodischer Ansätze wie der automatisierten Inhaltsanalyse, der Netzwerkanalyse oder der qualitativen Beobachtung. Sie eint die Suche nach innovativen Lösungen für ein gemeinsames Problem, nämlich die zunehmende Dynamik öffentlicher Kommunikationsprozesse adäquat abzubilden.

As the first volume of World Scientific Encyclopedia with Semantic Computing and Robotic Intelligence, this volume is designed to lay the foundation for the understanding of the Semantic Computing (SC), as a core concept to study Robotic Intelligence in the subsequent volumes. This volume aims to provide a reference to the development of Semantic Computing, in the terms of "meaning", "context", and "intention". It brings together a series of technical notes, in average, no longer than 10 pages in length, each focuses on one topic in Semantic Computing; being review article or research paper, to explain the fundamental concepts, models or algorithms, and possible applications of the technology concerned. This volume will address three core areas in Semantic Computing: Understanding the (possibly naturally-expressed) intentions (semantics) of users and expressing them in a machine-processable format: Semantics description languages, ontology integration, interoperability Understanding the meanings (semantics) of computational content (of various sorts, including, but is not limited to, text, video, audio, process, network, software and hardware) and expressing them in a machine-processable format in Multimedia, IoT, SDN, wearable computing, interfacable with mobile computing, search engines, question answering, web services,

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to support applications in biomedicine, healthcare, manufacturing, engineering, education, finance, entertainment, business, science and humanity Mapping the semantics of the user in context for content retrieval, management, creation in the form of structured data, image and video, audio and speech, big data, natural language, deep learning.

This book highlights cutting-edge research in the field of network science, offering scientists, researchers, students and practitioners a unique update on the latest advances in theory, together with a wealth of applications. It presents the peer-reviewed proceedings of the VII International Conference on Complex Networks and their Applications (COMPLEX NETWORKS 2018), which was held in Cambridge on December 11–13, 2018. The carefully selected papers cover a wide range of theoretical topics such as network models and measures; community structure and network dynamics; diffusion, epidemics and spreading processes; and resilience and control; as well as all the main network applications, including social and political networks; networks in finance and economics; biological and neuroscience networks; and technological networks.

Cognitive Computing: Theory and Applications, written by internationally renowned experts, focuses on cognitive computing and its theory and applications, including the use of cognitive computing to manage renewable energy, the environment, and other scarce resources, machine learning models and algorithms, biometrics, Kernel Based

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Models for transductive learning, neural networks, graph analytics in cyber security, neural networks, data driven speech recognition, and analytical platforms to study the brain-computer interface. Comprehensively presents the various aspects of statistical methodology Discusses a wide variety of diverse applications and recent developments Contributors are internationally renowned experts in their respective areas

The contributors in this book share, exchange, and develop new concepts, ideas, principles, and methodologies in order to advance and deepen our understanding of social networks in the new generation of Information and Communication Technologies (ICT) enabled by Web 2.0, also referred to as social media, to help policy-making. This interdisciplinary work provides a platform for researchers, practitioners, and graduate students from sociology, behavioral science, computer science, psychology, cultural studies, information systems, operations research and communication to share, exchange, learn, and develop new concepts, ideas, principles, and methodologies. Emerging Research Challenges and Opportunities in Computational Social Network Analysis and Mining will be of interest to researchers, practitioners, and graduate students from the various disciplines listed above. The text facilitates the dissemination of investigations of the dynamics and structure of web based social networks. The book can be used as a reference text for advanced courses on Social Network Analysis, Sociology, Communication, Organization Theory, Cyber-anthropology, Cyber-diplomacy, and Information Technology and Justice.

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Handbook of Approximation Algorithms and Metaheuristics, Second Edition reflects the tremendous growth in the field, over the past two decades. Through contributions from leading experts, this handbook provides a comprehensive introduction to the underlying theory and methodologies, as well as the various applications of approximation algorithms and metaheuristics. Volume 1 of this two-volume set deals primarily with methodologies and traditional applications. It includes restriction, relaxation, local ratio, approximation schemes, randomization, tabu search, evolutionary computation, local search, neural networks, and other metaheuristics. It also explores multi-objective optimization, reoptimization, sensitivity analysis, and stability. Traditional applications covered include: bin packing, multi-dimensional packing, Steiner trees, traveling salesperson, scheduling, and related problems. Volume 2 focuses on the contemporary and emerging applications of methodologies to problems in combinatorial optimization, computational geometry and graphs problems, as well as in large-scale and emerging application areas. It includes approximation algorithms and heuristics for clustering, networks (sensor and wireless), communication, bioinformatics search, streams, virtual communities, and more. About the Editor Teofilo F. Gonzalez is a professor emeritus of computer science at the University of California, Santa Barbara. He completed his Ph.D. in 1975 from the University of Minnesota. He taught at the University of Oklahoma, the Pennsylvania State University, and the University of Texas at Dallas, before joining the UCSB computer science faculty in 1984. He spent sabbatical leaves

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at the Monterrey Institute of Technology and Higher Education and Utrecht University. He is known for his highly cited pioneering research in the hardness of approximation; for his sublinear and best possible approximation algorithm for k-tMM clustering; for introducing the open-shop scheduling problem as well as algorithms for its solution that have found applications in numerous research areas; as well as for his research on problems in the areas of job scheduling, graph algorithms, computational geometry, message communication, wire routing, etc.

The two-volume set LNAI 7301 and 7302 constitutes the refereed proceedings of the 16th Pacific-Asia Conference on Knowledge Discovery and Data Mining, PAKDD 2012, held in Kuala Lumpur, Malaysia, in May 2012. The total of 20 revised full papers and 66 revised short papers were carefully reviewed and selected from 241 submissions. The papers present new ideas, original research results, and practical development experiences from all KDD-related areas. The papers are organized in topical sections on supervised learning: active, ensemble, rare-class and online; unsupervised learning: clustering, probabilistic modeling in the first volume and on pattern mining: networks, graphs, time-series and outlier detection, and data manipulation: pre-processing and dimension reduction in the second volume.

The field of intelligent decision technologies is interdisciplinary in nature, bridging computer science with its development of artificial intelligence, information systems with its development of decision support systems, and engineering with its development of

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systems. This book presents the 45 papers accepted for presentation at the 5th KES International Conference on Intelligent Decision Technologies (KES-IDT 2013), held in Sesimbra, Portugal, in June 2013. The conference consists of keynote talks, oral and poster presentations, invited sessions and workshops on the applications and theory of intelligent decision systems and related areas. The conference provides an opportunity for the presentation and discussion of interesting new research results, promoting knowledge transfer and the generation of new ideas. The book will be of interest to all those whose work involves the development and application of intelligent decision systems.

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