Foreword

As never experienced before, in the rapidly growing world of the Internet, social networks, and emergence of the omnipresence of floods of data, arises a genuine and pressing need to make sense of the surrounding digital world, visualize, analyze and acquire knowledge from data. With this regard, we witness a highly visible and undisputed role of knowledge discovery and data mining (KDD). After more than almost two decades, KDD is a vibrant field of research, which every year is confronted with new challenges and opportunities coming from the dynamic environment of cyberspace and a way in which people interact with new media. Social media have revolutionized the world and immensely changed a way people communicate among themselves and with computer systems (being continuously endowed with new functionalities). The role of KDD in this domain is unquestionable: there are tangible benefits to understand human needs, organize resources by comprehending ways in which human interacts, offer a conceptual framework for business intelligence. There is a growing pressure to endow the technology of KDD with methods and tools to deal with the mobility of the environment of social media and address the complex dynamics and interactions.

Human-system interaction is at the heart of intelligent systems. Granularity of information becomes central to the analysis and design of efficient human-system interaction schemes. Granular Computing delivers a broad, well-established platform to cope with granular information, formalize it (quite often resorting here to fuzzy sets or rough sets) and process information granules. KDD has to address the challenges human-centric systems bring into the picture.

This volume offers a comprehensive, well-rounded view at the concepts, methodologies, algorithms, and systems and solutions of data mining in social networks and fuzzy systems. The authors offer a truly remarkable wealth of ideas, identifying issues central to data mining in new challenging environments such as social networks. The organization of the volume highlights the two key focal points of applications in data mining, namely dynamic social networks (Part I) and fuzzy systems (Part II). In the first one, the authors identify main features of social media and social networks and elaborate on the innovative ways in which the crucial problems of data mining arising in this setting could be addressed. Those include data preprocessing, dealing with dynamic facets of processes of interaction, data security, content changes analysis and investigating their impact on data mining processes, studying data mining in mobile environments. Emerging data mining tools for social network analysis are covered. Part II is devoted to data mining in fuzzy systems. Owing to the specificity of these human-centric systems, we encounter interesting issues when exploiting or augmenting classic schemes of data mining. Fuzzy clustering and fuzzy association rules along their analysis play here a pivotal role and their position is well exemplified in this volume through a number of interesting contributions.

The Editor, Dr. Vishal Bhatnagar has to be congratulated for the excellent job. This volume is indeed a highly welcome, timely, and an important publication providing the reader with a very much needed material both of a significant research and applied nature.

Witold Pedrycz
University of Alberta, Edmonton, Canada

Witold Pedrycz *(IEEE- M'88, SM'90, F'99) is a Professor and Canada Research Chair (CRC - Computational Intelligence) in the Department of Electrical and Computer Engineering, University of Alberta, Edmonton, Canada. He is also with the Systems Research Institute of the Polish Academy of Sciences, Warsaw, Poland. He also holds an appointment of special professorship in the School of Computer Science, University of Nottingham, UK. In 2009, Dr. Pedrycz was elected a foreign member of the Polish Academy of Sciences. His main research directions involve Computational Intelligence, fuzzy modeling and Granular Computing, knowledge discovery and data mining, fuzzy control, pattern recognition, knowledge-based neural networks, relational computing, and Software Engineering. He has published numerous papers in this area. He is also an author of 14 research monographs covering various aspects of Computational Intelligence and Software Engineering. Witold Pedrycz has been a member of numerous program committees of IEEE conferences in the area of fuzzy sets and neurocomputing. Dr. Pedrycz is intensively involved in editorial activities. He is an Editor-in-Chief of Information Sciences and Editor-in-Chief of IEEE Transactions on Systems, Man, and Cybernetics - part A. He currently serves as an Associate Editor of IEEE Transactions on Fuzzy Systems and is a member of a number of editorial boards of other international journals. He has edited a number of volumes; the most recent one is entitled "Handbook of Granular Computing." In 2007, he received a prestigious Norbert Wiener award from the IEEE Systems, Man, and Cybernetics Council. He is a recipient of the IEEE Canada Computer Engineering Medal 2008. In 2009, he has received a Cajastur Prize for Soft Computing from the European Centre for Soft Computing for pioneering and multifaceted contributions to Granular Computing.*