Preface

Sentiment analysis arises as one of the important approaches to realize social analytics. Sentiment analysis and prediction along with ontology design, analysis, and usage are essential to numerous pursuits in knowledge engineering and a variety application areas embracing business, health sector, Internet, social networking, politics, and economy. We have been witnessing a spectrum of new concepts, methods, and innovative applications. Capturing the sentiments and emotional states present in textual information embraces a wide range of web-oriented activities, such as those detecting the sentiments associated to the product reviews, developing marketing programs enhancing customer services, identifying new opportunities, and presenting financial market prediction. The rapid growth of user-generated data (e.g., consumer reviews) associated with various social media sites has triggered the development of social analytics tools useful to automatically extract, analyze, and summarize user-generated contents. In the era of Web 2.0, a sheer volume of user-contributed data is profoundly visible. A representative example of so-called sentic computing is described as a paradigm, which combines opinion mining and sentiment analysis, by exploiting artificial intelligence and semantic web techniques to recognize, interpret, and process opinions and sentiments in natural language. Feature-based summarization systems are developed to extract explicit product features and sentiments at sentence level.

Currently, many studies have been focused on the construction of fuzzy ontologies originating from different sources. For instance, one can refer to some standard entity-relationship (ER) models that have shown a widespread usage. We may also allude to some approaches that have been proposed for modeling fuzzy information in ER and extended entity-relationship (EER) models. Building fuzzy ontologies from fuzzy EER models arose as one of long-term interesting pursuits. Then the constructed fuzzy ontologies could be represented in the fuzzy OWL language.

Evidently, human centricity is positioned at the forefront of the conceptual, methodological, and algorithmic developments in sentiment analysis and ontologies. Human knowledge is formalized through constructs of ontology. People

interact with systems and anticipate that any communication is helpful and becomes realized in a friendly and highly supportive environment. Consumer comments are subjective in nature and inherently loaded with emotions. They might be also contradictory and inconsistent. Such comments present on the web call for advanced processing tools so that we can transform them into coherent and meaningful views at products and services. Subsequently, the constructed views help organizations draw sound conclusions and enhance their business practices.

Computational Intelligence (CI) forming an advanced framework of concepts and algorithms that are visibly human-centric plays here a crucial role. From this perspective, CI is positioned in a unique manner to deliver a methodological and computational setting to sentiment analysis and ontology-driven constructs and processing. As a matter of fact, some of its roles with this regard have already been vividly demonstrated; however, there are a number of innovative avenues still worth pursuing.

The ultimate objectives of this edited volume is to provide the reader with a fully updated, in-depth treatise on the emerging principles, conceptual underpinnings, algorithms, and practices of CI in the realization of concepts and implementation of models of sentiment analysis and ontology-oriented engineering.

This volume involves studies devoted to the key issues of sentiment analysis, sentiment models, and ontology engineering. The book is structured into three main parts. The first one, composed of three chapters, offers a comprehensive and prudently structured exposure to the fundamentals of sentiment analysis and natural language processing stressing different points of view. The second part of the book consists of studies devoted to the concepts, methodologies, and algorithmic developments elaborating on fuzzy linguistic aggregation to emotion analysis, carrying out interpretability of computational sentiment models, emotion classification, and sentiment-oriented information retrieval, a methodology of adaptive dynamics in knowledge acquisition. The chapters forming the third part of the volume build a plethora of applications showing how sentiment analysis and ontologies become successfully applied to investment strategies, customer experience management, disaster relief, monitoring in social media, customer review rating prediction, and ontology learning.

An overall concise characterization of the objectives of the edited volume can be offered through several focal points:

- Systematic exposure of the concepts, design methodology, and detailed algorithms. The structure of the volume mostly adheres to the top-down strategy starting with the concepts and motivation and then proceeding with the detailed design that materializes in specific algorithms as well as case studies and applications.
- Individual chapters with clearly delineated agenda and well-defined focus and additional reading material available via carefully selected references.
- A wealth of carefully structured illustrative material. The volume includes a series of brief illustrative numeric experiments, detailed schemes, and more advanced problems.

- Self-containment. The intent is to make a material self-contained and, if necessary, augment some parts with a step-by-step explanation of more advanced concepts supported by a significant amount of illustrative numeric material and some application scenarios. Several introductory chapters fully satisfy this objective.

Given the theme of this undertaking, this book is aimed at a broad audience of researchers and practitioners. Owing to the nature of the material being covered and a way it has been organized, the volume will appeal to the well-established communities including those active in various disciplines in which sentiment analysis and ontologies, their analysis and optimization are of genuine relevance. Those involved in intelligent systems, data analysis, Internet engineering, CI, and knowledge-based systems will benefit from the exposure to the subject matter.

Considering the way in which the edited volume has been structured, this book may serve as a highly useful reference material for graduate students and senior undergraduate students.

We would like to take this opportunity to express our sincere thanks to the authors for presenting results of their innovative research and sharing their expertise in the area. We have received a large number of high quality submissions; it is needless to say that we had to make a number of difficult decisions to choose a limited number of papers to be included in the volume. The reviewers deserve our thanks for their constructive and timely input. We very much appreciate the continuous support and encouragement from the Editor-in-Chief, Prof. Janusz Kacprzyk whose leadership and dedication makes this book series a highly visible vehicle to disseminate the most recent, highly relevant, and far-fetching publications in the domain of computational intelligence and Internet engineering and its various applications.

We hope that this volume will be of genuine interest to a broad audience of readers and the research reported here will help continue with further vibrant progress in research, education, and help foster numerous practical endeavors.

<div align="right">

Witold Pedrycz
Shyi-Ming Chen

</div>