

Computational Social Sciences

A series of authored and edited monographs that utilize quantitative and computational methods to model, analyze, and interpret large-scale social phenomena. Titles within the series contain methods and practices that test and develop theories of complex social processes through bottom-up modeling of social interactions. Of particular interest is the study of the co-evolution of modern communication technology and social behavior and norms, in connection with emerging issues such as trust, risk, security, and privacy in novel socio-technical environments.

Computational Social Sciences is explicitly transdisciplinary: quantitative methods from fields such as dynamical systems, artificial intelligence, network theory, agent-based modeling, and statistical mechanics are invoked and combined with state-of-the-art mining and analysis of large data sets to help us understand social agents, their interactions on and offline, and the effect of these interactions at the macro level. Topics include, but are not limited to social networks and media, dynamics of opinions, cultures and conflicts, socio-technical co-evolution, and social psychology. Computational Social Sciences will also publish monographs and selected edited contributions from specialized conferences and workshops specifically aimed at communicating new findings to a large transdisciplinary audience. A fundamental goal of the series is to provide a single forum within which commonalities and differences in the workings of this field may be discerned, hence leading to deeper insight and understanding.

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Social Collective Intelligence

Combining the Powers of Humans
and Machines to Build a Smarter Society

 Springer

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Preface

Social collective intelligence is an emerging area at the intersection of collective intelligence and social informatics, where social processes between humans are being leveraged and enhanced, by means of advanced Information and Communication Technologies (ICT), to solve challenging problems using the contributions of human collectives. Rather than being a well-defined area, it presents itself—at least for the time being—as a mix of various methods and technologies, such as social media and social computing, human-based computation, social networks and complex systems theory, crowdsourcing, and many other areas which all somehow aim at developing or understanding collectively intelligent systems by combining advanced ICT with the powers of individual and collective human intelligence.

Within this broader area, while novel applications—from mobile social networking services to socially augmented reality systems—are appearing (and disappearing) at an ever-increasing rate, the ability to engineer these systems to concrete design objectives remains, until now, essentially a “black art”. Although research in the different areas involved has produced many significant contributions, we are still far from a principled approach for designing and operating these kinds of systems.

This book serves two purposes: On the one hand, while we are not yet in a position to develop textbook-like material for the field of Social Collective Intelligence, we aim to consolidate the fragmented research landscape, gathering contributions that capture the state of the art in all relevant areas, thus providing an up-to-date survey of existing research. In this respect, we put particular emphasis on giving technological and socio-technical aspects equal weight, as we believe that human factors and new technologies need to go hand in hand in developing successful future social collective intelligence systems, maybe more so than in any other area of digital technologies. On the other hand, we focus on the engineering aspect of such systems, thereby taking a distinctly different approach from much of the work done in the complex systems and related social science literature, which primarily focuses on analysis and prediction. While these aspects are also dealt with in several chapters of this book, our objective is to give an overview of appropriate

techniques that both scientists and practitioners can use in order to build purposeful and effective social collective intelligence systems.

Based on this overall approach, we expect that this book will be of interest to different audiences: Social scientists who want to understand the computational machinery that drives such applications, and how it interacts with human-centric and societal concerns. Researchers and practitioners in information and communication technologies, who need to acquire an understanding of the socio-technical dimension of these systems, as well as a comprehensive overview of relevant computational techniques. Various stakeholders from businesses, public organisations, and the general public, who want to go beyond a naïve understanding of novel technologies emerging in this area and require adequate knowledge of theoretical foundations and technological potential to make informed decisions, whether this be for commissioning novel systems, regulating their use, or even actively participating in them as a contributor. And, finally, graduate students from various disciplines who are looking for a comprehensive treatment of all aspects of this new type of systems.

This book is divided into three parts: Part I comprises of several chapters covering the foundations and theory behind Social Collective Intelligence. These provide an overview of the area, discuss opportunities and challenges, and investigate fundamental issues and problems. In Part II, we cover the some of the key technologies that are needed to develop social collective intelligence systems. This part addresses core techniques and approaches that can be useful for systems development and analysis, but also more peripheral concerns relevant to the “ecosystem” of social collective intelligence applications. Part III concludes the volume with descriptions of key application domains and several case studies from which insights and lessons can be learnt.

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