

# Preface

The areas of ubiquitous and social computing are creating new environments that foster the social interaction of users in several dimensions. On the ubiquitous side, there are different small distributed devices and sensors. For social media and social web, there are a variety of social networking environments being implemented in an increasing number of social media applications. With these, ubiquitous and social environments are transcending many diverse domains and contexts, including events and activities in business and personal life.

Altogether, understanding and modeling ubiquitous (and) social systems requires novel approaches, methods, and techniques for their analysis. This book sets out to explore this area by presenting a number of current approaches and studies addressing selected aspects of this problem space. The individual contributions of this book focus on problems related to the mining, modeling, and recommendation in ubiquitous social media, i.e., integrating both ubiquitous data and social media. Methods for mining, modeling, and recommendation can then help to advance our understanding of the dynamics and structures inherent to the respective systems integrating and applying ubiquitous social media, as well as for engineering applications.

Specifically, this book focuses on the collective intelligence in ubiquitous and social environments and how this data can be exploited to generate predictive models that serve as a basis for recommender systems in those environments. In this context, we present work that tackles issues such as personalization in social streams, recommendations exploiting social and ubiquitous data, and efficient information processing in social systems. Furthermore, this book presents work dealing with the problem of mining patterns from ubiquitous social data, including mobility mining and exploratory methods for ubiquitous data analytics.

The papers presented in this book are revised and significantly extended versions of papers submitted to two related workshops: The 4th International Workshop on Mining Ubiquitous and Social Environments (MUSE 2013), which was held on September 23, 2013 in conjunction with the European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases (ECML-PKDD 2013) in Prague, Czech Republic, and the 4th International Workshop on Modeling Social Media (MSM 2013), which was held on May 1, 2013 in conjunction with ACM Hypertext in Paris, France. With respect to these two complementing workshop themes, the papers contained in this volume form a starting point for bridging the gap between the social and ubiquitous worlds. Both social media applications and ubiquitous systems benefit from modeling aspects, either at the system level, or for providing a sound data basis for further analysis and mining options. On the other hand, data analysis and data mining can provide novel insights into the user's behavior within social media systems, and thus similarly enhance and support modeling prospects.

Concerning the range of topics, we broadly consider two main themes: predictive modeling in ubiquitous social data and pattern mining in ubiquitous social data.

For the first main theme, we included four works focusing on recommendation aspects in ubiquitous social media. We present “Network Activity Feed: Finding Needles in a Haystack” by Shlomo Berkovsky and Jill Freyne providing an interesting survey of related work tackling the problem of personalization of social network news feeds. In “Refining Frequency-Based Tag Reuse Predictions by Means of Time and Semantic Context” by Dominik Kowald, Simone Kopeinik, Paul Seitlinger, Tobias Ley, Dietrich Albert, and Christoph Trattner a novel recommendation approach based on the ACT-R theory to predict the user’s tags is presented. In another interesting work “Forgetting the Words but Remembering the Meaning: Modeling Forgetting in a Verbal and Semantic Tag Recommender” by Dominik Kowald, Paul Seitlinger, Simone Kopeinik, Tobias Ley, and Christoph Trattner show how semantic and verbal decay influence the tag prediction problem. The paper “Ontology-Enabled Access Control and Privacy Recommendations” by Marcel Heupel, Lars Fischer, Mohamed Bourimi, and Simon Scerri presents the relevant problem of privacy in social networks and recommendation. In “Utilizing Online Social Network and Location-Based Data to Recommend Products and Categories in Online Marketplaces” by Emanuel Lacic, Dominik Kowald, Lukas Eberhard, Christoph Trattner, Leandro Balby Marinho, and Denis Parra the authors describe how location-based and social network data can be exploited to recommend products and categories efficiently.

For the second main theme, we included three works focusing on the pattern mining aspect. The paper “Exploratory Subgroup Analytics on Ubiquitous Data” by Martin Atzmueller, Juergen Mueller, and Martin Becker presents a study on exploratory subgroup analytics to obtain interesting descriptive patterns in ubiquitous data. In “Predictability Analysis of Aperiodic and Periodic Model for Long-Term Human Mobility Using Ambient Sensors” by Danaipat Sodkomkham, Roberto Legaspi, Ken-ichi Fukui, Koichi Moriyama, Satoshi Kurihara, and Masayuki Numao the authors present an analysis of the effectiveness of periodic and aperiodic predictive models on human mobility data. Finally, the paper “Open Smartphone Data for Structured Mobility and Utilization Analysis in Ubiquitous Systems” by Nico Piatkowski, Jochen Streicher, Katharina Morik, and Olaf Spinczyk sets out to present an open smartphone utilization and mobility dataset that was captured during a 4-month study period.

It is the hope of the editors that this book (i) catches the attention of an audience interested in recent problems and advancements in the fields of social media, online social networks, and ubiquitous data and (ii) helps to spark a conversation on new problems related to the engineering, modeling, mining, analysis, and recommendation in the field of ubiquitous social media and systems integrating these.

We want to thank the workshop and post-proceedings reviewers for their careful help in selecting and the authors for improving the submissions. We also thank all the authors for their contributions and the presenters for the interesting talks and the lively discussions at both workshops. Only this has allowed us to set up such a book.

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