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Behavioral Analytics in Social and Ubiquitous Environments

6th International Workshop on Mining Ubiquitous and Social Environments, MUSE 2015
Porto, Portugal, September 7, 2015

6th International Workshop on Modeling Social Media, MSM 2015
Florence, Italy, May 19, 2015

7th International Workshop on Modeling Social Media, MSM 2016
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Preface

The emergence of ubiquitous computing has started to create new environments consisting of small, heterogeneous, and distributed devices that foster the social interaction of users in several dimensions. Similarly, the upcoming social web also integrates the user interactions in social networking environments. However, the characteristics of ubiquitous and social mining in general are quite different from the current mainstream data mining and machine learning. Unlike in traditional data mining scenarios, data does not emerge from a small number of (heterogeneous) data sources, but potentially from hundreds to millions of different sources. Often there is only minimal coordination and thus these sources can overlap or diverge in many possible ways. Steps into this new and exciting application area are the analysis of this new data, the adaptation of well-known data mining and machine learning algorithms, and finally, the development of new algorithms. Behavioral analytics is an important topic within ubiquitous and social environments, e.g., concerning web applications as well as extensions in mobile and ubiquitous applications, for understanding user behavior. Some important issues in this area include personalization, recommendation, tie strength or link prediction, community discovery, profiling by extracting and understanding user and group behavior, predicting user behavior and user modeling, and prediction from social media.

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 behavioral analytics in social and ubiquitous contexts. We present work that tackles issues such as natural language processing in social media, collective intelligence, analysis of social and mobility patterns, and anomaly detection in social and ubiquitous data.

This book is based on submissions which are revised and significantly extended versions of papers submitted to three related workshops: The 6th International Workshop on Mining Ubiquitous and Social Environments (MUSE 2015) which was held on September 7, 2015, in conjunction with the European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases (ECML-PKDD 2015) in Porto, Portugal, the 6th International Workshop on Modeling Social Media (MSM 2015) that was held on May 19, 2015, in conjunction with ACM WWW in Florence, Italy, and the 7th International Workshop on Modeling Social Media (MSM 2016) which was held on April 12, 2016 in conjunction with the ACM WWW in Montreal, Canada. With respect to these three complementing workshop themes, the papers contained in this volume bridge the gap between the social and ubiquitous worlds.

The first paper is “Link Classification and Tie Strength Ranking in Online Social Networks with Exogenous Interaction Networks” by Mohammed Abufouda and Katharina Anna Zweig. The authors address the link assessment problem in social networks that suffer from noisy links by using machine learning classifiers for assessing

and ranking the links in the social network of interest using the data from the exogenous interaction networks.

In the second paper, “Stratification-Oriented Analysis of Community Structure in Networks of Face-to-Face Proximity” by Stefan Bloemheugel, Martin Atzmueller, and Marie Postma, the authors discuss performing automatic detection of face-to-face proximity during two student meet-ups for the purposes of community detection using wearable sensors and analyzing the proximity interactions between the students to indicate social relationships.

In the third paper, “Analyzing Big Data Streams with Apache SAMOA” by Nicolas Kourtellis, Gianmarco De Francisci Morales, and Albert Bifet, the authors deal with analyzing big data streams using a new open-source platform called Apache SAMOA (Scalable Advanced Massive Online Analysis).

The fourth paper entitled “Multimodal Behavioral Mobility Pattern Mining and Analysis using Topic Modeling on GPS Data” by Sebastiaan Merino and Martin Atzmueller deals with identifying risky driving behavior to increase traffic safety by using topic modeling and mobility pattern mining on GPS data.

In the fifth paper, “Sequential Monte Carlo Inference based on Activities for Overlapping Community Models” by Shohei Sakamoto and Koji Eguchi, the authors present their work on an incremental Gibbs sampler based on node activities that focuses only on observations within a fixed term length for online sequential estimation of the Mixed Member Stochastic Blockmodel.

The sixth paper, “Results of a Survey about the Perceived Task Similarities in Micro Task Crowdsourcing Systems” by Steffen Schnitzer, Svenja Neitzel, Sebastian Schmidt, and Christoph Rensing, provides an empirical study about how workers perceive task similarities in micro-task crowdsourcing systems based on cultural background, worker characteristics, and task characteristics.

Finally, the seventh paper is “Provenance of Explicit and Implicit Interactions on Social Media with W3C PROV-DM” by Io Taxisidou, Tom De Nikes, and Peter M. Fischer. The authors discuss how with the enormous amount of social media data that is generated quickly, it is difficult to determine the relevance and trustworthiness of the information in that data, therefore they created a model to tackle this based on the W3C PROV Data Model.

We hope that this book (i) catches the attention of an audience interested in recent problems and advancements in the fields of big data analytics, social media, and ubiquitous data and (ii) helps to spark a conversation on new problems related to the engineering, modeling, mining, and analysis in the field of ubiquitous social media and systems integrating these. We want to thank the workshop and post-proceeding 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 their interesting talks and the lively discussions at the three workshops.

July 2019

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