

Human-Centered Social Media Analytics

Yun Fu
Editor

Human-Centered Social Media Analytics

Editor

Yun Fu

Department of ECE, College of Engineering

Northeastern University

Boston, MA

USA

ISBN 978-3-319-05490-2

ISBN 978-3-319-05491-9 (eBook)

DOI 10.1007/978-3-319-05491-9

Springer Cham Heidelberg New York Dordrecht London

Library of Congress Control Number: 2014933527

© Springer International Publishing Switzerland 2014

This work is subject to copyright. All rights are reserved by the Publisher, whether the whole or part of the material is concerned, specifically the rights of translation, reprinting, reuse of illustrations, recitation, broadcasting, reproduction on microfilms or in any other physical way, and transmission or information storage and retrieval, electronic adaptation, computer software, or by similar or dissimilar methodology now known or hereafter developed. Exempted from this legal reservation are brief excerpts in connection with reviews or scholarly analysis or material supplied specifically for the purpose of being entered and executed on a computer system, for exclusive use by the purchaser of the work. Duplication of this publication or parts thereof is permitted only under the provisions of the Copyright Law of the Publisher's location, in its current version, and permission for use must always be obtained from Springer. Permissions for use may be obtained through RightsLink at the Copyright Clearance Center. Violations are liable to prosecution under the respective Copyright Law. The use of general descriptive names, registered names, trademarks, service marks, etc. in this publication does not imply, even in the absence of a specific statement, that such names are exempt from the relevant protective laws and regulations and therefore free for general use.

While the advice and information in this book are believed to be true and accurate at the date of publication, neither the authors nor the editors nor the publisher can accept any legal responsibility for any errors or omissions that may be made. The publisher makes no warranty, express or implied, with respect to the material contained herein.

Printed on acid-free paper

Springer is part of Springer Science+Business Media (www.springer.com)

Preface

With the advent of the social media era, technologies for social computing have become prevalent. This book provides a unique view of applying human-centered computing in the social media scenario, especially classification and recognition of attributes, demographics, contexts, and correlations of human information among unconstrained visual data from the social media domain. These cues are utilized for inferring people's social status, relationships, preferences, intentions, personalities, needs, networking and lifestyles, etc. Understanding of humans in social media will play an important role in many real-world applications with both academic and industrial values and broad impacts.

As a professional textbook and research monograph, this book comprises 10 chapters covering multiple emerging topics in this new interdisciplinary field, which links popular research fields of Face Recognition, Human-Centered Computing, Social Media, Image Processing, Pattern Recognition, Computer Vision, Big Data, and Human-Computer Interaction. Contributed by experts and practitioners from both academia and industry, these chapters complement each other from different angles and compose a solid overview of the human-centered social media analytics. Well-balanced contents for both theoretical analysis and real-world applications will benefit readers of different levels of expertise, help them to quickly gain the knowledge of fundamentals, and further inspire them toward insightful understanding. This book may be used as an excellent reference for researchers or as a major textbook for graduate student courses requiring minimal undergraduate prerequisites at academic institutions.

The content is divided into two parts of topics. The first five chapters are on Social Relationships in Human-Centered Media, while the last five chapters are on Human Attributes in Social Media Analytics. [Chapter 1](#) provides an introduction to social relationship in the social media context, and describes how to bridge human-centered social media content across web domains; [Chap. 2](#) presents a method for social relationships in media analytics, in particular, features, models, and analytics for learning social relations from videos; [Chap. 3](#) discusses understanding social relationships in social networks. A method of community understanding in location-based social networks is presented; [Chap. 4](#) describes the social relationship in social roles, especially social role recognition for human event understanding; [Chap. 5](#) presents how to classify social relationships in human-object interactions through integrating randomization and discrimination;

[Chap. 6](#) introduces a method to construct people recognition in social media through social context; [Chap. 7](#) presents an example of demographic sensing in social media for female facial beauty attribute recognition and editing; [Chap. 8](#) demonstrates face age estimation in social media from a data representation perspective; [Chap. 9](#) presents methodologies of kin relationship and identity recognition and understanding from group photos in social media; [Chap. 10](#) presents the application of a probabilistic model under social context to occupation recognition and profession prediction.

I thank all the chapter authors of this book for contributing their most recent research works. I also sincerely thank Simon Rees from Springer for support to this book project.

Boston, MA

Yun Fu

Contents

Part I Social Relationships in Human-Centered Media

1	Bridging Human-Centered Social Media Content Across Web Domains	3
	Suman Deb Roy, Tao Mei and Wenjun Zeng	
2	Learning Social Relations from Videos: Features, Models, and Analytics	21
	Lei Ding and Alper Yilmaz	
3	Community Understanding in Location-based Social Networks	43
	Yi-Liang Zhao, Qiang Chen, Shuicheng Yan, Daqing Zhang and Tat-Seng Chua	
4	Social Role Recognition for Human Event Understanding	75
	Vignesh Ramanathan, Bangpeng Yao and Li Fei-Fei	
5	Integrating Randomization and Discrimination for Classifying Human-Object Interaction Activities	95
	Aditya Khosla, Bangpeng Yao and Li Fei-Fei	

Part II Human Attributes in Social Media Analytics

6	Recognizing People in Social Context	117
	Gang Wang, Andrew Gallagher, Jiebo Luo and David Forsyth	
7	Female Facial Beauty Attribute Recognition and Editing	133
	Jinjun Wang, Yihong Gong and Douglas Gray	
8	Facial Age Estimation: A Data Representation Perspective	149
	Xin Geng	

9 Identity and Kinship Relations in Group Pictures 175
Ming Shao, Siyu Xia and Yun Fu

**10 Recognizing Occupations Through Probabilistic Models:
A Social View. 191**
Ming Shao and Yun Fu

**Erratum to: Community Understanding in Location-based
Social Networks E1**
Yi-Liang Zhao, Qiang Chen, Shuicheng Yan, Daqing Zhang
and Tat-Seng Chua

Index 207