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Saad Ali • Ko Nishino • Dinesh Manocha
Mubarak Shah
Editors

Modeling, Simulation and Visual Analysis of Crowds

A Multidisciplinary Perspective

Editors

Saad Ali
Center for Vision Technologies
SRI International
Princeton, NJ, USA

Ko Nishino
Department of Computer Science
Drexel University
Philadelphia, PA, USA

Dinesh Manocha
Department of Computer Science
University of North Carolina
Chapel Hill, NC, USA

Mubarak Shah
Center for Research in Computer Vision
University of Central Florida
Orlando, FL, USA

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Preface

Accurate analysis and synthesis of human behavior in crowds, a large and dense group of people with varying characteristics and goals, is a common requirement across a wide range of domains. If the human behavior, including those of individuals, small groups of people, and even the crowd as a whole – can be interpreted and anticipated in arbitrary real-world situations, a repertoire of important applications, many of which are societally important, can be realized: For example, perpetrators disguised in a busy street corner will be easily spotted and tracked in a surveillance video feed; new buildings, public places and outdoor environments will be designed to optimize the space use with the dynamically changing flow of people in mind, while minimizing the time need for evacuation whenever necessary; and the social psychology of people can be studied based on large-scale, longitudinal observations, and many more.

The goal of this book is to provide the readers a comprehensive map of the current state of the art in distinct but related fields, mainly in computer vision, graphics, and evacuation dynamics, towards the common goal of better analyzing and synthesizing the pedestrian movement in dense, heterogeneous crowds. The monograph is organized into different parts that consolidate various aspects of research towards this common goal, namely the modeling, simulation, and visual analysis of crowds. Many of the chapters in these parts extend the works that were presented at the first workshop on the same topic at International Conference on Computer Vision, 2011, and collectively cover the diverse challenges involved in better understanding of human crowds. Our hope is, through this book, the readers will see the common ideas and vision as well as the different challenges and techniques for modeling, analyzing, and simulating crowds, that will stimulate novel approaches to getting us a step closer to fully grasping “crowds.”

This book grew out of the first IEEE Workshop on Modeling, Simulation and Visual Analysis of Large Crowds, that was held in conjunction with International Conference of Computer Vision 2011. Therefore, first of all we would like to acknowledge the workshop program committee who worked tirelessly for the success of the workshop and authors that contributed their valuable pieces of work. We would also like to thank Prof. Jie Yang and National Science Foundation (NSF)

funding based on grant IIS-1142382 to provide travel support for the workshop. We are also grateful to our host institutions (SRI International, Drexel University, University of North Carolina and University of Central Florida) for providing a highly stimulating research environment that enables pursuit of new research ideas and discoveries. Springer has provided excellent support throughout the preparation of the book, and we would like to specially thank their staff for their support and professionalism. Many people have helped proof reading draft material and providing comments and suggestions. We would like to thank all of them for their time and valuable contribution towards improving the quality of the book.

Princeton, NJ, USA
Philadelphia, PA, USA
Chapel Hill, NC, USA
Orlando, FL, USA

Saad Ali
Ko Nishino
Dinesh Manocha
Mubarak Shah

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Contributors

Saad Ali Center for Vision Technologies, SRI International, 201 Washington Road, Princeton, NJ, USA

Norman I. Badler University of Pennsylvania, Philadelphia, USA

Stefania Bandini Department of Computer Science, Systems and Communication, Complex Systems and Artificial Intelligence (CSAI) Research Center, University of Milan – Bicocca, Milano, Italy

Maik Boltes Jülich Supercomputing Centre, Forschungszentrum Jülich GmbH, Jülich, Germany

Avishy Y. Carmi Department of Mechanical and Aerospace Engineering, Nanyang Technological University, Singapore

Antoni B. Chan Department of Computer Science, City University of Hong Kong, Hong Kong, China

Ke Chen Queen Mary University of London, London, UK

M. Chraibi Jülich Supercomputing Centre, Forschungszentrum Jülich, Jülich, Germany

M. Cristani Pattern Analysis and Computer Vision (PAVIS), Istituto Italiano di Tecnologia, Genova, Italy

Sean Curtis University of North Carolina at Chapel Hill, Chapel Hill, USA

A. Del Bue Pattern Analysis and Computer Vision (PAVIS), Istituto Italiano di Tecnologia, Genova, Italy

Funda Durupinar University of Pennsylvania, Philadelphia, USA

Simon J. Godsill Department of Engineering, University of Cambridge, Cambridge, UK

Shaogang Gong Queen Mary University of London, London, UK

Helena Grillon Centrale de Compensation, Geneva, Switzerland

Pini Gurfil Department of Aerospace Engineering, Technion Israel Institute of Technology, Kesalsaba, Israel

Stephen J. Guy University of North Carolina at Chapel Hill, Chapel Hill, USA

Mubbasir Kapadia Center for Human Modeling and Simulation, University of Pennsylvania, Philadelphia, USA

Louis Kratz Department of Computer Science, Drexel University, Philadelphia, USA

Laura Leal-Taixé Leibniz University Hannover, Hannover, Germany

Chen Change Loy Vision Semantics Limited, The Chinese University of Hong Kong, Hong Kong, China

Jonathan Maim Bengaluru Area, India

Dinesh Manocha Department of Computer Science, University of North Carolina, Chapel Hill, USA

Lyudmila Mihaylova School of Computing and Communications, Lancaster University, Lancaster, UK

V. Murino Pattern Analysis and Computer Vision (PAVIS), Istituto Italiano di Tecnologia, 16163 Genova, Italy

Ko Nishino Department of Computer Science, Drexel University, Philadelphia, USA

Sze Kim Pang DSO National Laboratories, Singapore

Jan-Frederik Pietschmann Center for Industrial and Applied Mathematics (CIAM), Royal Institute of Technology, Stockholm, Sweden

R. Raghavendra Pattern Analysis and Computer Vision (PAVIS), Istituto Italiano di Tecnologia, Genova, Italy

Bodo Rosenhahn Leibniz University Hannover, Hannover, Germany

E. Sangineto Pattern Analysis and Computer Vision (PAVIS), Istituto Italiano di Tecnologia, Genova, Italy

A. Schadschneider Institute for Theoretical Physics, Universität zu Köln, Köln, Germany

François Septier Signal Processing and Information Theory Group, TELECOM Lille 1, Villeneuve d'Ascq Cedex, France

Armin Seyfried Jülich Supercomputing Centre, Forschungszentrum Jülich, Jülich GmbH, Germany

Computer Simulation for Fire Safety and Pedestrian Traffic, Bergische Universität Wuppertal, Wuppertal, Germany

Mubarak Shah Center for Research in Computer Vision, Harris Corporation Engineering Center, University of Central Florida, Orlando, USA

Alexander Shoulson University of Pennsylvania, Philadelphia, USA

Daniel Thalmann Institute for Media Innovation, Nanyang Technological University, Singapore

Nuno Vasconcelos Department of Electrical and Computer Engineering, University of California, San Diego, USA

Giuseppe Vizzari Department of Computer Science, Systems and Communication, Complex Systems and Artificial Intelligence (CSAI) Research Center, University of Milan – Bicocca, Milano, Italy

Tao Xiang Queen Mary University of London, London, UK

Barbara Yersin Bengaluru Area, India

Basim Zafar Hajj Research Institute, Umm al-Qura University, Mecca, Saudi Arabia

Jun Zhang Jülich Supercomputing Centre, Forschungszentrum Jülich GmbH, Jülich, Germany