

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.

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Modeling, Simulation and Visual Analysis of Crowds

A Multidisciplinary Perspective

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2013, XI, 411 p. 208 illus., Hardcover

ISBN: 978-1-4614-8482-0