## Contents

### Part I  Crowd Simulation and Behavior Modeling

2 On Force-Based Modeling of Pedestrian Dynamics ............... 23  
Mohcine Chraibi, Andreas Schadschneider,  
and Armin Seyfried

3 Connection Between Microscopic and Macroscopic Models ........ 43  
Jan-Frederik Pietschmann

4 Analysis of Crowd Dynamics with Laboratory Experiments ........ 67  
Maik Boltes, Jun Zhang, and Armin Seyfried

5 Modeling a Crowd of Groups: Multidisciplinary and Methodological Challenges ................................................. 99  
Stefania Bandini and Giuseppe Vizzari

6 Scalable Solutions for Simulating, Animating, and Rendering Real-Time Crowds of Diverse Virtual Humans ....... 123  
Daniel Thalmann, Helena Grillon, Jonathan Maïm,  
and Barbara Yersin

7 Authoring Multi-actor Behaviors in Crowds with Diverse Personalities .......................................................... 147  
Mubbasir Kapadia, Alexander Shoulson, Funda Durupinar,  
and Norman I. Badler

8 Virtual Tawaf: A Velocity-Space-Based Solution for Simulating Heterogeneous Behavior in Dense Crowds ............ 181  
Sean Curtis, Stephen J. Guy, Basim Zafar,  
and Dinesh Manocha
# Part II Visual Analysis of Crowds

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Title</th>
<th>Authors</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>Crowd Flow Segmentation Using Lagrangian Particle Dynamics</td>
<td>Saad Ali and Mubarak Shah</td>
<td>213</td>
</tr>
<tr>
<td>10</td>
<td>Modeling Crowd Flow for Video Analysis of Crowded Scenes</td>
<td>Ko Nishino and Louis Kratz</td>
<td>237</td>
</tr>
<tr>
<td>11</td>
<td>Pedestrian Interaction in Tracking: The Social Force Model and Global Optimization Methods</td>
<td>Laura Leal-Taixé and Bodo Rosenhahn</td>
<td>267</td>
</tr>
<tr>
<td>12</td>
<td>Surveillance of Crowded Environments: Modeling the Crowd by Its Global Properties</td>
<td>Antoni B. Chan and Nuno Vasconcelos</td>
<td>295</td>
</tr>
<tr>
<td>13</td>
<td>Inferring Leadership from Group Dynamics Using Markov Chain Monte Carlo Methods</td>
<td>Avishy Y. Carmi, Lyudmila Mihaylova, François Septier, Sze Kim Pang, Pini Gurfil, and Simon J. Godsill</td>
<td>325</td>
</tr>
<tr>
<td>14</td>
<td>Crowd Counting and Profiling: Methodology and Evaluation</td>
<td>Chen Change Loy, Ke Chen, Shaogang Gong, and Tao Xiang</td>
<td>347</td>
</tr>
</tbody>
</table>
Modeling, Simulation and Visual Analysis of Crowds
A Multidisciplinary Perspective
2013, XI, 411 p. 208 illus., Hardcover
ISBN: 978-1-4614-8482-0