

---

# Contents

---

## Part I Experiment and Evacuation

---

<b>The UK WTC9/11 Evacuation Study: An Overview of the Methodologies Employed and Some Preliminary Analysis</b> <i>Edwin R. Galea, Lynn Hulse, Rachel Day, Asim Siddiqui, Gary Sharp, Karen Boyce, Louise Summerfield, David Canter, Melisa Marselle, and Paul V. Greenall</i> .....	3
<b>Evacuation Movement in Photoluminescent Stairwells</b> <i>Guyène Proulx and Noureddine Bénichou</i> .....	25
<b>Automatic Extraction of Pedestrian Trajectories from Video Recordings</b> <i>Maik Boltes, Armin Seyfried, Bernhard Steffen, and Andreas Schadschneider</i> .....	43
<b>Stairwell Evacuation from Buildings: What We Know We Don't Know</b> <i>Richard D. Peacock, Jason D. Averill, and Erica D. Kuligowski</i> .....	55
<b>Evacuation of a High Floor Metro Train in a Tunnel Situation: Experimental Findings</b> <i>Monika Oswald, Hubert Kirchberger, and Christian Lebeda</i> .....	67
<b>Using Laser Scanner Data to Calibrate Certain Aspects of Microscopic Pedestrian Motion Models</b> <i>Dietmar Bauer and Kay Kitazawa</i> .....	83
<b>Pedestrian Vision and Collision Avoidance Behavior: Investigation of the Information Process Space of Pedestrians Using an Eye Tracker</b> <i>Kay Kitazawa and Taku Fujiyama</i> .....	95

**FDS+Evac: An Agent Based Fire Evacuation Model**  
*Timo Korhonen, Simo Hostikka, Simo Heliövaara, and Harri Ehtamo* .. 109

**Comparisons of Evacuation Efficiency and Pre-travel Activity Times in Response to a Sounder and Two Different Voice Alarm Messages**  
*David Purser* ..... 121

**Design of Voice Alarms—the Benefit of Mentioning Fire and the Use of a Synthetic Voice**  
*Daniel Nilsson and Håkan Frantzich* ..... 135

**Enhanced Empirical Data for the Fundamental Diagram and the Flow Through Bottlenecks**  
*Armin Seyfried, Maik Boltjes, Jens Kähler, Wolfram Klingsch, Andrea Portz, Tobias Rupprecht, Andreas Schadschneider, Bernhard Steffen, and Andreas Winkens* ..... 145

**Parameters of Pedestrian Flow for Modeling Purposes**  
*Valerii V. Kholshchikov and Dmitrii A. Samoshin* ..... 157

**Emergency Preparedness in the Case of a Tsunami—Evacuation Analysis and Traffic Optimization for the Indonesian City of Padang**  
*Gregor Lämmel, Marcel Rieser, Kai Nagel, Hannes Taubenböck, Günter Strunz, Nils Goseberg, Thorsten Schlurmann, Hubert Klüpfel, Neysa Setiadi, and Jörn Birkmann* ..... 171

**Case Studies on Evacuation Behaviour in a Hotel Building in BART and in Real Life**  
*Margrethe Kobes, Nancy Oberijé, and Martina Duyvis* ..... 183

**Analysis of Empirical Trajectory Data of Pedestrians**  
*Anders Johansson and Dirk Helbing* ..... 203

**Model-Based Real-Time Estimation of Building Occupancy During Emergency Egress**  
*Robert Tomastik, Satish Narayanan, Andrzej Banaszuk, and Sean Meyn* 215

**Experiments on Evacuation Dynamics for Different Classes of Situations**  
*Jarosław Was* ..... 225

**Prediction and Mitigation of Crush Conditions in Emergency Evacuations**  
*Peter J. Harding, Martyn Amos, and Steve Gwynne* ..... 233

**Start Waves and Pedestrian Movement—An Experimental Study**  
*Christian Rogsch* ..... 247

**Clearance Time for Pedestrian Crossing**  
*Craig R. Childs, Taku Fujiyama, and Nick Tyler* ..... 249

**Ship Evacuation—Guidelines, Simulation, Validation, and Acceptance Criteria**  
*Hubert Klüpfel* ..... 257

**Empirical Study of Pedestrians’ Characteristics at Bottlenecks**  
*Andreas Winkens, Tobias Rupprecht, Armin Seyfried, and Wolfram Klingsch* ..... 263

**RFID Technology Applied for Validation of an Office Simulation Model**  
*Vincent Tabak, Bauke de Vries, and Jan Dijkstra* ..... 269

**Study on Crowd Flow Outside a Hall via Considering Velocity Distribution of Pedestrians**  
*Xiang Shu Liu, Jia Xiu Pan, Liang Yujuan, and Yu Xue* ..... 277

**Analysis on the Propagation Speed of Pedestrian Reaction: Velocity of Starting Wave and Stopping Wave**  
*Akiyasu Tomoeda, Daichi Yanagisawa, and Katsuhiko Nishinari* ..... 285

---

**Part II Simulation and Modeling**

---

**Toward Smooth Movement of Crowds**  
*Katsuhiko Nishinari, Yushi Suma, Daichi Yanagisawa, Akiyasu Tomoeda, Ayako Kimura, and Ryousuke Nishi* ..... 293

**Modeling Evacuees’ Exit Selection with Best Response Dynamics**  
*Harri Ehtamo, Simo Heliövaara, Simo Hostikka and Timo Korhonen* ..... 309

**Front-to-Back Communication in a Microscopic Crowd Model**  
*Colin Marc Henein and Tony White* ..... 321

**Comparison of Various Methods for the Calculation of the Distance Potential Field**  
*Tobias Kretz, Cornelia Bönisch, and Peter Vortisch* ..... 335

**Agent-Based Simulation of Evacuation: An Office Building Case Study**  
*Yiqing Lin, Igor Fedchenia, Bob LaBarre, and Robert Tomastik* ..... 347

**A Genetic Algorithm Module for Spatial Optimization in Pedestrian Simulation**  
*Lukas Kellenberger and Ruedi Müller* ..... 359

**Opinion Formation and Propagation Induced by Pedestrian Flow**  
*Yu Xue, Yan-fang Wei, Huan-huan Tian, and Li-juan Liang* ..... 371

**Passenger Dynamics at Airport Terminal Environment**  
*Michael Schultz, Christian Schulz, and Hartmut Fricke* ..... 381

**Application Modes of Egress Simulation**  
*Steve M.V. Gwynne and Erica D. Kuligowski* ..... 397

**Investigating the Impact of Aircraft Exit Availability on Egress Time Using Computer Simulation**  
*Edwin R. Galea, Madeleine Togher, and Peter Lawrence* ..... 411

**Bounded Rationality Choice Model Incorporating Attribute Threshold, Mental Effort, and Risk Attitude: Illustration to Pedestrian Walking Direction Choice Decision in Shopping Streets**  
*Wei Zhu and Harry Timmermans* ..... 425

**A SCA-Based Model for Open Crowd Aggregation**  
*Stefania Bandini, Mizar Luca Federici, Sara Manzoni, and Stefano Redaelli* ..... 439

**Hardware Implementation of a Crowd Evacuation Model Based on Cellular Automata**  
*Ioakeim G. Georgoudas, Georgios C. Sirakoulis, and Ioannis T. Andreadis* ..... 451

**Applying a Discrete Event System Approach to Problems of Collective Motion in Emergency Situations**  
*Paolo Lino and Guido Maione* ..... 465

**SIMULEM: Introducing Goal Oriented Behaviours in Crowd Simulation**  
*Sébastien Paris, Delphine Lefebvre, and Stéphane Donikian* ..... 479

**Conflicts at an Exit in Pedestrian Dynamics**  
*Daichi Yanagisawa, Akiyasu Tomoeda, and Katsuhiko Nishinari* ..... 491

**Improving Pedestrian Dynamics Modeling Using Fuzzy Logic**  
*Phillip Tomé, François Bonzon, Bertrand Merminod, and Kamiar Aminian* ..... 503

**Modeling the Link Volume Counts as a Function of Temporally Dependent OD-Flows**  
*Dietmar Bauer* ..... 509

**Effect of Subconscious Behavior on Pedestrian Counterflow in a Lattice Gas Model Under Open Boundary Conditions**  
*Kuang Hua, Song Tao, Li Xingli, and Dai Shiqiang* ..... 517

**Hand-Calculation Methods for Evacuation Calculation—Last Chance for an Old-Fashioned Approach or a Real Alternative to Microscopic Simulation Tools?**  
*Christian Rogsch, Henning Weigel, and Wolfram Klingsch* ..... 523

**Adding Higher Intelligent Functions to Pedestrian Agent Model**  
*Toshiyuki Kaneda, Takumi Yoshida, Yanfeng He, Masaki Tamada, and Yasuhiro Kitakami* ..... 529

**“FlowTech” and “EvaTech”: Two Computer-Simulation Methods for Evacuation Calculation**  
*Ilya Karkin, Vladimir Grachev, Andrey Skochilov, and Vladimir Zverev* . 537

**Large Scale Microscopic Evacuation Simulation**  
*Gregor Lämmel, Marcel Rieser, and Kai Nagel*..... 547

**Numerical Optimisation Techniques Applied to Evacuation Analysis**  
*Rodrigo Machado Tavares and Edwin R. Galea* ..... 555

**A Multi-Method Approach to the Interpretation of Pedestrian Spatio-Temporal Behaviour**  
*Alexandra Millonig and Georg Gartner*..... 563

**The Microscopic Model and the Panicking Ball-Bearing**  
*Colin Marc Henein and Tony White* ..... 569

**Design of Decision Rules for Crowd Controlling Using Macroscopic Pedestrian Flow Simulation**  
*Stefan Seer, Norbert Brändle, and Dietmar Bauer*..... 577

**3-Tier Architecture for Pedestrian Agent in Crowd Simulation**  
*Gao Peng and Xu Ruihua* ..... 585

**Optimising Vessel Layout Using Human Factors Simulation**  
*Steven J. Deere, Edwin R. Galea, and Peter J. Lawrence*..... 597

<b>Agent-Based Animated Simulation of Mass Egress Following an Improvised Explosive Device (IED) Attack</b>	
<i>Douglas A. Samuelson, Matthew Parker, Austin Zimmerman, Stephen Guerin, Joshua Thorp, and Owen Densmore</i>	605
<b>A Novel Kinetic Model to Simulate Evacuation Dynamics</b>	
<i>Sergei Burlatsky, Vladim Atrazhev, Nikolay Erikhman, and Satish Narayanan</i>	611
<b>Egress Route Choice Modelling—Concepts and Applications</b>	
<i>Volker Schneider and Rainer Könnecke</i>	619
<b>Architectural Cue Model in Evacuation Simulation for Underground Space</b>	
<i>Chengyu Sun, Bauke de Vries, and Qi Zhao</i>	627
<b>Integrating Strategies in Numerical Modelling of Crowd Motion</b>	
<i>Juliette Venel</i>	641
<b>Small-Grid Analysis of Evacuation Processes with a Lattice Gas Model for Mixed Pedestrian Dynamics</b>	
<i>Yan-fang Wei, Yu Xue, and Shi-qiang Dai</i>	647
<b>Evacuation Simulation and Human Behaviour Models in Tall Buildings</b>	
<i>Marja-Liisa Siikonen and Janne S. Sorsa</i>	653
<b>Proof of Evacuation Routes and Safety Exits: Time Data as the Main Criteria for the Evaluation of Escape Routes and Safety Exits?</b>	
<i>Nathalie Waldau, Marita Kersken-Bradley, and Thilo Hoffmann</i>	659
<b>Dependence of Modelled Evacuation Times on Key Parameters and Interactions</b>	
<i>David Purser</i>	667
<b>A Modification of the Social Force Model by Foresight</b>	
<i>Bernhard Steffen</i>	677
<b>Models for Crowd Movement and Egress Simulation</b>	
<i>Hubert Klüpfel</i>	683
<b>Modelling Pedestrian Escalator Behaviour</b>	
<i>Michael J. Kinsey, Edwin R. Galea, Peter J. Lawrence, Darren Blackshields, Lynn Hulse, Rachel Day, and Gary Sharp</i>	689

<b>Introducing a Coupled Model for Simulating Crowd Behaviour</b>	
<i>Alicia Guadalupe Ortega Camarena and Dominik Jürgens</i> .....	697
<b>Evacuation Modelling of Fire Scenarios in Passenger Trains</b>	
<i>Jorge Capote, Daniel Albear, Orlando Abreu, Mariano Lázaro, and Arturo Cuesta</i> .....	705
<b>Pedestrian Dynamics with Event-Driven Simulation</b>	
<i>Mohcine Chraïbi and Armin Seyfried</i> .....	713

---

### Part III Psychology

---

<b>The Need for Behavioral Theory in Evacuation Modeling</b>	
<i>Erica D. Kuligowski and Steve M.V. Gwynne</i> .....	721
<b>NO-PANIC. “Escape and Panic in Buildings”—Architectural Basic Research in the Context of Security and Safety Research</b>	
<i>Christa Illera, Matthias Fink, Harry Hinneberg, Karin Kath, Nathalie Waldau, Andrea Rosič, and Gabriel Wurzer</i> .....	733
<b>Was It Panic? An Overview About Mass-Emergencies and Their Origins All Over the World for Recent Years</b>	
<i>Christian Rogsch, Michael Schreckenberger, Eric Tribble, Wolfram Klingsch, and Tobias Kretz</i> .....	743
<b>Hierarchical Structure of the Mass and Group-Level Behaviors in Urban Rail Transfer Stations</b>	
<i>Xiaolei Zou, Ruihua Xu, and Peng Gao</i> .....	757
<b>The Use of a Structure and Its Influence on Evacuation Behavior</b>	
<i>Steve M.V. Gwynne and Dave Boswell</i> .....	773

---

### Part IV Miscellaneous

---

<b>Inhalation Injury of Lung and Heart After Inhalation of Toxic Substances</b>	
<i>Herbert Löllgen and Dieter Leyk</i> .....	781
<b>Quantitative Comparison of International Design Standards of Escape Routes in Assembly Buildings</b>	
<i>Burkhard Forell, Ralf Seidenspinner, and Dietmar Hossler</i> .....	791

**Visualizing the Human Form for Simulation and Planning**  
*Gabriel Wurzer* ..... 803

**A Real-Time Pedestrian Animation System**  
*Christian Schulz, Michael Schultz, and Hartmut Fricke* ..... 811

**Modeling of Escape Routes According to Occupancy,  
Economy, and Level of Safety in Slovak Republic**  
*Martin Lopusniak* ..... 819

**List of Participants** ..... 825



<http://www.springer.com/978-3-642-04503-5>

Pedestrian and Evacuation Dynamics 2008

(Eds.) W.W.F. Klingsch; C. Rogsch; A. Schadschneider; M.  
Schreckenberg

2010, XIV, 833 p., Hardcover

ISBN: 978-3-642-04503-5