

Preface

Nobody doubts how important the evacuation process for life safety can be. Evacuation modelling essentially aims to understand this complex phenomenon. This requires identifying and selecting the relevant aspects of this process in the real world and then using a model (that usually include a set of conceptual, mathematical and, frequently, computational models) to represent them. Despite being a simplified reflection of reality, evacuation modelling is very useful because it helps us to simulate, visualize, manipulate and gain additional information about the process being represented and, therefore, improve life safety. Evacuation modelling allows the main features of this process to be quantified and thus contributes to their optimization. This book, *Evacuation Modeling Trends*, is intended for those involved in safety, from emergency and intervention personnel to students, engineers and researchers. The chapter authors are international experts in their own fields. The book covers basic concepts and definitions, theory on human behavior and human performance data, available tools and simulation approaches, model development, application and validation methods and suggests some challenges for the future in the subject.

Chapter 1 presents basic concepts and definitions of evacuation modelling, describes the different solutions to represent the evacuees and the geometry and discusses the current evacuation modelling methods.

Chapter 2 discusses the nature and importance of the different parameters involved in ASET and RSET and the interactions between them. Consideration is given to the data and research efforts needed to develop and incorporate functions for the different parameters into comprehensive escape and evacuation simulations, with a number of examples illustrating different aspects and approaches.

Chapter 3 addresses the information available regarding how people typically behave during an evacuation, the tools used to represent this performance and how these tools might be properly implemented. The focus is on individual evacuee performance—what we know about it and how it might be represented.

Chapter 4 discusses the verification and validation (V&V) methods of evacuation modelling, revises current literature on V&V approaches and presents a set of recommended verification tests and examples of validation tests.

Chapter 5 discusses some of the future challenges in evacuation modelling: new scenarios and factors for future model developments, addresses the problem of using deterministic and/or stochastic approaches in evacuation modelling and proposes and discusses the use of evacuation models for supporting timely decisions in real time.

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