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Series editor

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Daniel N. Cassenti
Editor

Advances in Human Factors in Simulation and Modeling

Proceedings of the AHFE 2018 International Conferences on Human Factors and Simulation and Digital Human Modeling and Applied Optimization, Held on July 21–25, 2018, in Loews Sapphire Falls Resort at Universal Studios, Orlando, Florida, USA

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Advances in Human Factors and Ergonomics 2018

AHFE 2018 Series Editors

Tareq Z. Ahram, Florida, USA
Waldemar Karwowski, Florida, USA

9th International Conference on Applied Human Factors and Ergonomics and the Affiliated Conferences

Proceedings of the AHFE 2018 International Conferences on Human Factors and Simulation and Digital Human Modeling and Applied Optimization, Held on July 21–25, 2018, in Loews Sapphire Falls Resort at Universal Studios, Orlando, Florida, USA.

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Preface

This volume is a compilation of cutting-edge research regarding how simulation and modeling support human factors. The compilation of chapters is the result of efforts by the 9th International Conference on Applied Human Factors and Ergonomics (AHFE), which provides the organization for several affiliated conferences. Specifically, the chapters herein represent the 3rd International Conference on Human Factors and Simulation and the 7th International Conference on Digital Human Modeling and Applied Optimization.

Simulation is a technology that supports an approximation of real-world scenes and scenarios for a user. For example, a cockpit simulator represents the configuration of the inside of a cockpit and presents a sensory and motor experience to mimic flight. Simulations advance research by providing similar experiences to those scenarios that would otherwise be impractical to carry out in the real world for such reasons as monetary cost or safety concerns. Simulations can support numerous goals including training or practice on established skills.

Modeling is a somewhat different tool than simulation, though the two are often used interchangeably as they both imply estimation of real-world scenes or scenarios that bypass practical concerns. The difference in the context of this book is that modeling is not intended to provide a user with an experience, but rather to represent anything pertinent about the real world in computational algorithms, possibly including people and their psychological processing. Modeling may answer questions about large-scale scenarios that would be difficult to address otherwise, such as the effects of economic interventions or smaller-scale scenarios such as the cognitive processing required to perform a task that is otherwise undetectable by measurement devices.

The goal of the research herein is to bring awareness and attention to advances that human factors specialists may make in their field to address the design of programs of research, systems, policies, and devices. This book provides a plethora of avenues for human factors research that may be helped by simulation and modeling.

The book is divided into the following sections:

1. Virtual Environments and Augmented Reality
2. Modeling and Simulation Applications
3. Extreme Environments and Military Applications
4. Cognitive Modeling
5. Applications in Safety and Risk Perception
6. Digital Modeling and Biomechanics

Special thanks to Thomas Alexander and Vincent Duffy for the significant contributions to the conference on Digital Human Modeling and Applied Optimization. All papers in this book were either reviewed or contributed by the members of editorial board. For this, I would like to recognize the board members listed below:

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This book is the first step in covering diverse topics in simulation and modeling. I hope this book is informative and helpful for the researchers and practitioners in developing better products, services, and systems.

July 2018 Daniel N. Cassenti

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