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Volume 275

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Advances in Usability, User Experience, Wearable and Assistive Technology

Proceedings of the AHFE 2021 Virtual Conferences on Usability and User Experience, Human Factors and Wearable Technologies, Human Factors in Virtual Environments and Game Design, and Human Factors and Assistive Technology, July 25–29, 2021, USA

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Advances in Human Factors and Ergonomics 2021

AHFE 2021 Series Editors

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12th International Conference on Applied Human Factors and Ergonomics and the
Affiliated Conferences (AHFE 2021)

Proceedings of the AHFE 2021 Virtual Conferences on Usability and User
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Preface

This volume combines the proceedings of four affiliated conferences of the 2021 Applied Human Factors and Ergonomics Conference: the International Conference on Usability & User Experience, the International Conference on Human Factors and Wearable Technologies, the International Conference on Human Factors in Virtual Environments and Game Design and the International Conference on Human Factors and Assistive Technology.

The conference on usability and user experience focuses on strategies for achieving successful interaction with products, tools and technologies. Usable designs are able to accommodate the needs of potential users without requiring costly training. In this context, this book is concerned with emerging ergonomics concepts in the design of products and systems and with theories and applications of human factor knowledge for understanding human–system interaction, identifying key usability issues and eventually improving the corresponding products and systems.

The conferences on assistive and wearable technologies focus on the examination of problems in designing and providing assistive devices and services to individuals with disabilities or impairment, to assist mobility, communication, positioning, environmental control and daily living. Thus, this book also addresses a wide spectrum of theoretical and practical topics related to assistive and wearable technologies. By combining practical experience and academic research, it discusses solutions for adapting to machinery and wearables and increasing the technology acceptance, effectiveness and efficiency.

The conference on human factors in virtual environments and game design focuses on game industry, which has been rapidly expanding in the past decades. The level of complexity in game control interfaces and graphics has increased exponentially, in addition to the growing interest in integrating augmented reality in gaming experience. As a result, there is a growing demand for human factors and ergonomics practitioners to improve the users' engagement in game design. A variety of game designs, applications and study on their usability, as well as on users' engagement, have been gathered together in this book. This book shows how

user-centered practices can optimize user experience, thus improving user acceptance, satisfaction and engagement toward novel products and systems.

It addresses professionals, researchers and students in the broad field of human factors and ergonomics, who are especially interested in user-centered design, user experience and accessibility of human-machine interfaces, usability and accessibility of wearable technologies, game design as well as advanced applications of virtual, augmented and mixed realities.

This book is organized into fourteen sections focusing on the following subject matters:

Human Factors and Wearable Technologies

1. Human Factors and Wearable Technologies

Human Factors in Virtual Environments and Game Design

2. Virtual Reality Applications
3. Virtual Reality and Game Design in Education
4. Virtual Environments and Game Design
5. UX in Virtual and Augmented Reality Environments
6. UX in Gamification and Wearables

Human Factors and Assistive Technology

7. Assistive Technology

Usability and User Experience

8. Usability and User Experience Applications
9. User Experience in Transportation
10. Usability and User-Centered Design
11. User Interface and Accessibility
12. UX Design and Evaluation
13. Usability Evaluation
14. UX in Healthcare and Aging

We hope this book is informative, but even more—that it is thought-provoking. We hope it inspires, leading the reader to contemplate other questions, applications and potential solutions in creating good designs for all. Each section contains research papers that have been reviewed by members of the International Editorial Board. Our sincere thanks and appreciation to the board members as listed below:

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We hope this book is informative, but even more—that it is thought-provoking. We hope it inspires, leading the reader to contemplate other questions, applications and potential solutions in creating good designs for all.

July 2021

Tareq Z. Ahram
 Christianne Soares Falcão

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