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Human Systems Engineering and Design

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Preface

This volume, entitled *Human Systems Engineering and Design*, aims to provide a global forum for presenting and discussing novel design and systems engineering approaches, tools, methodologies, techniques, and solutions for integrating people, concepts, trends and applications in all areas of human endeavor in industry, economy, government, and education. Such applications include, but are not limited to, energy, transportation, urbanization and infrastructure development, digital manufacturing, social development, human health, sustainability, a new generation of service systems, as well as safety, risk assessment, healthcare, and cybersecurity in both civilian and military contexts. Indeed, rapid progress in developments in cognitive computing, modeling, and simulation, as well as smart sensor technology, will have a profound effect on the principles of human systems engineering and design at both the individual and societal levels in the near future.

This book focuses on advancing the theory and applications for integrating human requirements as part of an overall system and product solution, by adopting a human-centered design approach that utilizes and expands on the current knowledge of systems engineering supported by cognitive software and engineering, data analytics, simulation and modeling, and next-generation visualizations. This interdisciplinary approach will also expand the boundaries of the current state of the art by investigating the pervasive complexity that underlies the most profound design problems facing contemporary society today.

This book also presents many innovative studies of systems engineering and design with a particular emphasis on the development of technology throughout the lifecycle development process, including the consideration of user experience in the design of human interfaces for virtual, augmented, and mixed reality applications.

Reflecting on the above-outlined perspective, the papers contained in this volume are organized into eight unique research tracks with a total of eighteen sections, including:

IHSED 1: Human-Centered Design

Section 1: Human-Centered Design and User Experience
Section 2: User Interface Design Applications and Human Systems Integration

Section 3: Virtual Reality and Usability Evaluation Applications
Section 4: Human–Machine Collaboration
Section 5: Design Evaluation, Learning, and Assessment

IHSED 2: Innovative Materials for Product Development

Section 6: Innovative Materials for Product Development

IHSED 3: Systems Design and Human Diversity

Section 7: Systems Design and Human Diversity Applications
Section 8: Artificial Intelligence and Intelligent System Design

IHSED 4: Safety Engineering and Systems Complexity

Section 9: Safety Engineering and Complex Systems Design
Section 10: Occupational Safety and Risk Assessment
Section 11: Transportation System Design and Safety Engineering
Section 12: Safety Evaluation and Ergonomic Risks
Section 13: Organizational and Strategic Interventions

IHSED 5: Sports Design and Sports Medicine

Section 14: Sports Design and Sports Medicine

IHSED 6: Biomechanics, Health Disease, and Rehabilitation

Section 15: Biomechanics, Evaluation, and Assessment
Section 16: Health Management and Rehabilitation

IHSED 7: Human Cyber-Physical Systems Interactions

Section 17: Human Cyber-Physical Systems Interaction Applications

IHSED 8: Business, Design, and Technology

Section 18: Business, Design, and Technology

We would like to extend our sincere thanks to Hervé Quinart, CHU-Université de Reims Champagne-Ardenne, France, for his support. Our appreciation also goes to the members of the Scientific Program Advisory Board who have reviewed the accepted papers that are presented in this volume.

We hope that this book, which presents the current state of the art in human systems engineering and design, will be a valuable source of both theoretical and applied knowledge, enabling the human-centered design and applications of a variety of products, services, and systems for their safe, effective, and pleasurable use by people around the world.

October 2018

Tareq Ahram
Waldemar Karwowski
Redha Taiar

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Correction to: Human Systems Engineering and Design C1
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