

# **Advances in Intelligent Systems and Computing**

Volume 1026

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Tareq Ahram · Waldemar Karwowski ·  
Stefan Pickl · Redha Taiar  
Editors

# Human Systems Engineering and Design II

Proceedings of the 2nd International  
Conference on Human Systems  
Engineering and Design (IHSED2019):  
Future Trends and Applications,  
September 16–18, 2019, Universität  
der Bundeswehr München, Munich, Germany

 Springer



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ISSN 2194-5357

ISSN 2194-5365 (electronic)

Advances in Intelligent Systems and Computing

ISBN 978-3-030-27927-1

ISBN 978-3-030-27928-8 (eBook)

<https://doi.org/10.1007/978-3-030-27928-8>

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This Springer imprint is published by the registered company Springer Nature Switzerland AG  
The registered company address is: Gewerbestrasse 11, 6330 Cham, Switzerland

# 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, health care, 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 eleven sections, including:

- Section 1     Human-centered Design
- Section 2     Human–Robot Interaction
- Section 3     Transportation Design and Autonomous Driving

Section 4	Human-centered Design for Health Care
Section 5	User Experience and Virtual Environments
Section 6	Systems Design and Human Diversity
Section 7	Safety Engineering and Systems Complexity
Section 8	Sports Design and Sports Medicine
Section 9	Biomechanics, Health Management, and Rehabilitation
Section 10	Human Cyber-physical Systems Interactions
Section 11	Business Analytics, Design, and Technology

We would like to extend our sincere thanks to Universität der Bundeswehr München for their 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.

September 2019

Tareq Ahram  
Waldemar Karwowski  
Stefan Pickl  
Redha Taiar

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