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Human Systems Engineering and Design III

Proceedings of the 3rd International Conference on Human Systems Engineering and Design (IHSED2020): Future Trends and Applications, September 22–24, 2020, Juraj Dobrila University of Pula, Croatia

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Preface

As noted by the National Academy of Engineering (NAE, 2004) in the report entitled *The Engineer of 2020: Visions of Engineering in the New Century*, in the future, engineering will *"expand toward tighter connections between technology and the human experience, including… the ergonomic design of engineered products"*. Today, human factors discipline promotes a human-centered approach to systems design, with due consideration of a great variety of relevant factors, such as physical, cognitive, neural, social, emotional, organizational, developmental, ecological, environmental that are essential for the socioeconomic development and well-being of the global society.

Recent advances in cognitive computing, machine learning, and artificial intelligence, modeling, and simulation, as well as smart sensor technology, create new opportunities for the field of human systems engineering to contribute to the human-centered approach to the design of products and systems. These new developments also allow expanding the current boundaries of the state of the art of the human factors discipline by investigating the pervasive complexity that underlies the most problems facing contemporary society today.

The present book on *Human Systems Engineering and Design* contains a selected set of novel contributions to the theory and practice of human engineering and design for integrating people and technology in all areas of human endeavor by adopting a human-centered approach, supported by cognitive software and engineering, data analytics, simulation and modeling, and next-generation visualization methods.

The papers contained in this volume are organized into four main sections:

Section 1 Human-centered Design
Section 2 Systems Design and Human Diversity
Section 3 Safety Engineering and Systems Complexity
Section 4 Human Cyber-physical Systems Interactions

The presented papers introduce many innovative examples of systems engineering and design, emphasizing the development of technology throughout the lifecycle development process in the areas of advanced digital manufacturing, smart

energy, transportation, urbanization, and infrastructure, healthcare, and cybersecurity sectors on business and industry. Some of the presented studies also include the consideration of user experience in the design of human interfaces for virtual augmented and mixed reality applications.

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 theoretical and applied knowledge that enables 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.

Finally, we would like to extend our sincere thanks to the Juraj Dobrila University of Pula, FIPU Faculty of Informatics, for the support of the conference's organizational efforts. Our appreciation also goes to the Scientific Program Advisory Board of the IHSED 2020 Conference, who reviewed papers presented in this volume.

September 2020

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