Advances in Physical Ergonomics and Human Factors

Part I

Advances in Human Factors and Ergonomics 2014

5th International Conference on Applied Human Factors and Ergonomics

20 Volume Set: Proceedings of the 5th AHFE Conference 19-23 July 2014

Advances in The Human Side of Service Engineering	*Louis Freund and Wojciech Cellary*
Advances in Human Factors and Sustainable Infrastructure	*Jerzy Charytonowicz*
Advances in Human Aspects of Healthcare	*Vincent Duffy and Nancy Lightner*
Advances in Applied Digital Human Modeling	*Vincent Duffy*
Advances in Cross-Cultural Decision Making	*Sae Schatz, Joseph Cohn and Denise Nicholson*
Advances in Human Factors, Software, and Systems Engineering	*Ben Amaba and Brian Dalgetty*
Advances in Human Aspects of Transportation (Part I, II, III)	*Neville Stanton, Steve Landry Giuseppe Di Bucchianico and Andrea Vallicelli*
Advances in Safety Management and Human Factors	*Pedro Arezes and Paulo Carvalho*
Advances in Cognitive Engineering and Neuroergonomics	*Kay Stanney and Kelly Hale*
Advances in Social and Organizational Factors	*Peter Vink*
Advances in The Ergonomics in Manufacturing: Managing the Enterprise of the Future	*Stefan Trzcielinski and Waldemar Karwowski*
Advances in Physical Ergonomics and Human Factors (Part I, II)	*Tareq Ahram and Renliu Jang*
Advances in Ergonomics In Design, Usability & Special Populations (Part I, II, III)	*Marcelo Soares and Francisco Rebelo*
Advances in Affective and Pleasurable Design	*Yong Gu Ji and Sooshin Choi*
Advances in Science, Technology, Higher Education and Society in the Conceptual Age: STHESCA	*Tadeusz Marek*

Advances in Physical Ergonomics and Human Factors Part I

Edited By

Tareq Ahram

and

Renliu Jang

Published by AHFE Conference © 2014

Published by AHFE Conference © 2014

Printed in the United States of America on acid-free paper

Version Date: 20140710

International Standard Book Number: 978-1-4951-2104-3 (Hardback)

Visit the AHFE Web site at
http://www.ahfe.org

Table of Contents

Section 7: Work-Related Musculoskeletal Disorders (WMSD) Prevention

Section 8: Physical Hazard and Prevention

Preface

The discipline of human factors and ergonomics (HF/E) is concerned with the design of products, process, services, and work systems to assure their productive, safe and satisfying use by people. Physical ergonomics involves the design of working environments to fit human physical abilities. By understanding the constraints and capabilities of the human body and mind, we can design products, services and environments that are effective, reliable, safe and comfortable for everyday use.

A thorough understanding of the physical characteristics of a wide range of people is essential in the development of consumer products and systems. Human performance data serve as valuable information to designers and help ensure that the final products will fit the targeted population of end users. Mastering physical ergonomics and safety engineering concepts is fundamental to the creation of products and systems that people are able to use, avoidance of stresses, and minimization of the risk for accidents.

This book focuses on the advances in the physical HF/E, which are a critical aspect in the design of any human-centered technological system. The ideas and practical solutions described in the book are the outcome of dedicated research by academics and practitioners aiming to advance theory and practice in this dynamic and all-encompassing discipline.

A total of seventeen sections presented (eight sections in Part I and nine sections in Part II). Each section contains research that have been reviewed by members of the International Editorial Board. Our sincere thanks and appreciation to the Board members as listed below:

F. Aghazadeh, USA
M. Boocock, New Zealand
E. Cadavid, Colombia
J. Callaghan, Canada
P. Dempsey, USA
R. Feyen, USA
R. Goonetilleke, Hong Kong
J. Grobelny, Poland
J. James, South Africa
R. Jang, Taiwan
Y. Kwon, Korea
M. Lehto, USA
L. Ma, China
S. Maly, Czech Republic
J. Niu, China
I. Noy, USA
E. Occhipinti, Italy
Y. Okada, Japan
H. Pacaiova, Slovak Republic
Z. Roja, Latvia
K. Saarela, Finland
L. Saenz, Colombia
J. Sinay, Slovak Republic
H. Strasser, Germany
S. Vlkova, Czech Republic
T. Waters, USA

We hope that this book, which is the international state-of-the-art in physical domain of human factors, will be a valuable source of theoretical and applied knowledge enabling human-centered design of variety of products, services and systems for global markets.

July 2014

Tareq Ahram
University of Central Florida
Orlando, Florida, USA

Ren-Liu Jang
Ming Chi University of Technology
Taipei, Taiwan

Editors