

## PREFACE

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This Handbook is concerned with the role of humans in complex systems, the design of equipment and facilities for human use, and the development of environments for comfort and safety. The first and second editions of the Handbook were a major success and profoundly influenced the human factors profession. It was translated and published in Japanese and Russian and won the Institute of Industrial Engineers Joint Publishers Book of the Year Award. It has received strong endorsement from top management; the late Elliott Estes, retired president of General Motors Corporation, who wrote the Foreword to the first edition of the Handbook, indicated that “regardless of what phase of the economy a person is involved in, this Handbook is a very useful tool. Every area of human factors from environmental conditions and motivation to use of new communication systems . . . is well covered in the Handbook by experts in every field.”

In a literal sense, human factors and ergonomics is as old as the machine and the environment, for it was aimed at designing them for human use. However, it was not until World War II that human factors emerged as a separate discipline.

The field of human factors and ergonomics has developed and broadened considerably since its inception more than 60 years ago and has generated a body of knowledge in the following areas of specialization:

- The human factors function
- Human factors fundamentals
- Design of tasks and jobs
- Equipment, workplace, and environmental design
- Design for health, safety, and comfort
- Performance modeling
- Evaluation
- Human–computer interaction
- Design for individual differences
- Selected applications

The foregoing list shows how broad the field has become. As such, this Handbook should be of value to all human factors and ergonomics specialists, engineers, industrial hygienists, safety engineers, and human–computer interaction specialists.

Such a breadth of subject matter presents a serious challenge to represent successfully the entire field of human factors and ergonomics in a single Handbook. I did not believe in 2002, when this all began, that any one person could properly select the subjects to be included in the Handbook without serious distortions to fit his or her own particular area of knowledge and bias. Accordingly, an advisory board composed of experts in the more important areas of human factors and ergonomics was invited to

advise the editor in planning the contents of the Handbook. The advisory board members are listed on pages vii and viii. I sincerely appreciate their excellent counsel and advice during the preparation of this Handbook. Nevertheless, any sampling deficiencies that remain are of course my own responsibility.

The 61 chapters constituting the third edition of the Handbook were written by 108 people. In creating this Handbook, the authors gathered information from over 2700 references and presented over 500 figures and 250 tables to provide theoretically based and practically oriented material for use by both practitioners and researchers. In the third edition of the *Handbook of Human Factors and Ergonomics*, all of the 61 chapters have been completely newly written. This third edition of the Handbook covers totally new subject areas that were not included in the second edition. These include the following subjects:

- Communications
- Cultural ergonomics
- Human factors and ergonomics methods
- Situation awareness
- Affective and emotional design
- Virtual environments
- Human factors and ergonomics Inspection and Audits
- Multimodal user interface
- Online communities
- Human factors and information security
- Usability evaluation and testing
- Design of e-business Web sites
- Augmented cognition in HCI
- Design for disability
- Design for children
- Design for all
- Human factors and ergonomics standards
- Human factors and ergonomics in transportation

The main purpose of this Handbook is to serve the needs of the human factors practitioner. Each chapter has a strong theory and science base and is heavily tilted toward application orientation. As such, a significant number of case studies, examples, figures, and tables are utilized to facilitate the usability of the material presented.

The many contributing authors came through magnificently. I thank them all most sincerely for agreeing so willingly to create the Handbook with me.

I had the privilege of working with Robert L. Argentieri, our Wiley Executive Editor, who significantly facilitated my editorial work. I was truly fortunate to have during the preparation of this Handbook the most able contribution of Kim Gilbert, Editorial Manager of the Handbook, who has done a truly outstanding job with the cooperation of all the authors and compilation of the Handbook for production.

This Handbook would not have been possible without the excellent value judgment and support of Dr. Dennis Engi, Professor and Head of the School of Industrial Engineering at Purdue University.

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