

human factors of remotely operated vehicles volume 7 advances in human performance and cognitive engineering research

[#human factors ROV](#) [#remotely operated vehicles](#) [#human performance engineering](#) [#cognitive engineering research](#) [#ROV human-machine interaction](#)

Explore the latest advances in human factors, human performance, and cognitive engineering research, specifically tailored for remotely operated vehicles, offering critical insights into optimizing human-system interaction for enhanced operational efficiency and safety.

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Engineering Psychology and Human Performance

Forming connections between human performance and design Engineering Psychology and Human Performance, 4e examines human-machine interaction. The book is organized directly from the psychological perspective of human information processing. The chapters generally correspond to the flow of information as it is processed by a human being--from the senses, through the brain, to action--rather than from the perspective of system components or engineering design concepts. This book is ideal for a psychology student, engineering student, or actual practitioner in engineering psychology, human performance, and human factors Learning Goals Upon completing this book, readers should be able to: * Identify how human ability contributes to the design of technology. * Understand the connections within human information processing and human performance. * Challenge the way they think about technology's influence on human performance. * show how theoretical advances have been, or might be, applied to improving human-machine interaction

Human-Robot Interactions in Future Military Operations

Soldier-robot teams will be an important component of future battle spaces, creating a complex but potentially more survivable and effective combat force. The complexity of the battlefield of the future presents its own problems. The variety of robotic systems and the almost infinite number of possible military missions create a dilemma for researchers who wish to predict human-robot interactions (HRI) performance in future environments. Human-Robot Interactions in Future Military Operations provides an opportunity for scientists investigating military issues related to HRI to present their results cohesively within a single volume. The issues range from operators interacting with small ground robots

and aerial vehicles to supervising large, near-autonomous vehicles capable of intelligent battlefield behaviors. The ability of the human to 'team' with intelligent unmanned systems in such environments is the focus of the volume. As such, chapters are written by recognized leaders within their disciplines and they discuss their research in the context of a broad-based approach. Therefore the book allows researchers from differing disciplines to be brought up to date on both theoretical and methodological issues surrounding human-robot interaction in military environments. The overall objective of this volume is to illuminate the challenges and potential solutions for military HRI through discussion of the many approaches that have been utilized in order to converge on a better understanding of this relatively complex concept. It should be noted that many of these issues will generalize to civilian applications as robotic technology matures. An important outcome is the focus on developing general human-robot teaming principles and guidelines to help both the human factors design and training community develop a better understanding of this nascent but revolutionary technology. Much of the research within the book is based on the Human Research and Engineering Directorate (HRED), U.S. Army Research Laboratory (ARL) 5-year Army Technology Objective (ATO) research program. The program addressed HRI and teaming for both aerial and ground robotic assets in conjunction with the U.S. Army Tank and Automotive Research and Development Center (TARDEC) and the Aviation and Missile Development Center (AMRDEC) The purpose of the program was to understand HRI issues in order to develop and evaluate technologies to improve HRI battlefield performance for Future Combat Systems (FCS). The work within this volume goes beyond the research results to encapsulate the ATO's findings and discuss them in a broader context in order to understand both their military and civilian implications. For this reason, scientists conducting related research have contributed additional chapters to widen the scope of the original research boundaries.

Applied Attention Theory

Eye witness testimony, training, driving, and display design: these are just a few of the real-world domains in which depend on undivided attention. Emphasizing the link between theory and application, Applied Attention Theory provides a deep understanding of how theories of attention, developed from laboratory-based psychological research, can inform our understanding of everyday human performance in a wide number of applications and environments. The basic theories discussed concern divided, focused, and selective attention, and areas of application include mental workload measurement, multi-tasking, distracted driving, complex display design, education, and the training of attentional skills.

Human Systems Engineering and Design

This book focuses on novel design and systems engineering approaches, including theories and best practices, for promoting a better integration of people and engineering systems. It covers a range of hot topics related to: development of activity-centered and user-centered systems; interface design and human-computer interaction; usability and user experience; cooperative, participatory and contextual models; emergent properties of human behavior; innovative materials in manufacturing, and many more. Particular emphasis is placed on applications in sports, healthcare, and medicine. The book, which gathers selected papers presented at the 1st International Conference on Human Systems Engineering and Design: Future Trends and Applications (IHSED 2018), held on October 25-27, 2018, at CHU-Université de Reims Champagne-Ardenne, France, provides researchers, practitioners and program managers with a snapshot of the state-of-the-art and current challenges in the field of human systems engineering and design.

Sense and Avoid in UAS

There is increasing interest in the potential of UAV (Unmanned Aerial Vehicle) and MAV (Micro Air Vehicle) technology and their wide ranging applications including defence missions, reconnaissance and surveillance, border patrol, disaster zone assessment and atmospheric research. High investment levels from the military sector globally is driving research and development and increasing the viability of autonomous platforms as replacements for the remotely piloted vehicles more commonly in use. UAV/UAS pose a number of new challenges, with the autonomy and in particular collision avoidance, detect and avoid, or sense and avoid, as the most challenging one, involving both regulatory and technical issues. Sense and Avoid in UAS: Research and Applications covers the problem of detect, sense and avoid in UAS (Unmanned Aircraft Systems) in depth and combines the theoretical and application results by leading academics and researchers from industry and academia. Key features:

Presents a holistic view of the sense and avoid problem in the wider application of autonomous systems
Includes information on human factors, regulatory issues and navigation, control, aerodynamics and physics aspects of the sense and avoid problem in UAS Provides professional, scientific and reliable content that is easy to understand, and Includes contributions from leading engineers and researchers in the field Sense and Avoid in UAS: Research and Applications is an invaluable source of original and specialised information. It acts as a reference manual for practising engineers and advanced theoretical researchers and also forms a useful resource for younger engineers and postgraduate students. With its credible sources and thorough review process, Sense and Avoid in UAS: Research and Applications provides a reliable source of information in an area that is fast expanding but scarcely covered.

Speech Technology

This book gives an overview of the research and application of speech technologies in different areas. One of the special characteristics of the book is that the authors take a broad view of the multiple research areas and take the multidisciplinary approach to the topics. One of the goals in this book is to emphasize the application. User experience, human factors and usability issues are the focus in this book.

HCI International 2021 - Late Breaking Posters

This two-volume set CCIS 1498 and CCIS 1499 contains the late breaking posters presented during the 23rd International Conference on Human-Computer Interaction, HCII 2021, which was held virtually in July 2021. The total of 1276 papers and 241 posters included in the 39 HCII 2021 proceedings volumes was carefully reviewed and selected from 5222 submissions. Additionally, 174 papers and 146 posters are included in the volumes of the proceedings published after the conference, as “Late Breaking Work” (papers and posters). The posters presented in these two volumes are organized in topical sections as follows: HCI Theory and Practice; UX Design and Research in Intelligent Environments; Interaction with Robots, Chatbots, and Agents; Virtual, Augmented, and Mixed Reality; Games and Gamification; HCI in Mobility, Transport and Aviation; Design for All and Assistive Technologies; Physiology, Affect and Cognition; HCI for Health and Wellbeing; HCI in Learning, Teaching, and Education; Culture and Computing; Social Computing; Design Case Studies; User Experience Studies.

Handbook of Human Factors for Automated, Connected, and Intelligent Vehicles

Handbook of Human Factors for Automated, Connected, and Intelligent Vehicles Subject Guide: Ergonomics & Human Factors Automobile crashes are the seventh leading cause of death worldwide, resulting in over 1.25 million deaths yearly. Automated, connected, and intelligent vehicles have the potential to reduce crashes significantly, while also reducing congestion, carbon emissions, and increasing accessibility. However, the transition could take decades. This new handbook serves a diverse community of stakeholders, including human factors researchers, transportation engineers, regulatory agencies, automobile manufacturers, fleet operators, driving instructors, vulnerable road users, and special populations. It provides information about the human driver, other road users, and human–automation interaction in a single, integrated compendium in order to ensure that automated, connected, and intelligent vehicles reach their full potential. Features Addresses four major transportation challenges—crashes, congestion, carbon emissions, and accessibility—from a human factors perspective Discusses the role of the human operator relevant to the design, regulation, and evaluation of automated, connected, and intelligent vehicles Offers a broad treatment of the critical issues and technological advances for the designing of transportation systems with the driver in mind Presents an understanding of the human factors issues that are central to the public acceptance of these automated, connected, and intelligent vehicles Leverages lessons from other domains in understanding human interactions with automation Sets the stage for future research by defining the space of unexplored questions

Human Performance in Automated and Autonomous Systems

This book examines recent advances in theories, models, and methods relevant to automated and autonomous systems. The following chapters provide perspectives on modern autonomous systems, such as self-driving cars and unmanned aerial systems, directly from the professionals working with and studying them. Current theories surrounding topics such as vigilance, trust, and fatigue are examined throughout as predictors of human performance in the operation of automated systems. The challenges related to attention and effort in autonomous vehicles described within give credence to still-developing

methods of training and selecting operators of such unmanned systems. The book further recognizes the need for human-centered approaches to design; a carefully crafted automated technology that places the "human user" in the center of that design process. Features Combines scientific theories with real-world applications where automated technologies are implemented Disseminates new understanding as to how automation is now transitioning to autonomy Highlights the role of individual and team characteristics in the piloting of unmanned systems and how models of human performance are applied in system design Discusses methods for selecting and training individuals to succeed in an age of increasingly complex human-machine systems Provides explicit benchmark comparisons of progress across the last few decades, and identifies future prognostications and the constraints that impinge upon these lines of progress Human Performance in Automated and Autonomous Systems: Current Theory and Methods illustrates the modern scientific theories and methods to be applied in real-world automated technologies.

Human-Computer Interaction. HCI Intelligent Multimodal Interaction Environments

Here is the third of a four-volume set that constitutes the refereed proceedings of the 12th International Conference on Human-Computer Interaction, HCI 2007, held in Beijing, China, in July 2007, jointly with eight other thematically similar conferences. It covers multimodality and conversational dialogue; adaptive, intelligent and emotional user interfaces; gesture and eye gaze recognition; and interactive TV and media.

Human Factors in Automotive Engineering and Technology

Offering a unique perspective on vehicle design and on new developments in vehicle technology, this book seeks to bridge the gap between engineers, who design and build cars, and human factors, as a body of knowledge with considerable value in this domain. The work that forms the basis of the book represents more than 40 years of experience by the authors. Human Factors in Automotive Engineering and Technology imparts the authors' scientific background in human factors by way of actionable design guidance, combined with a set of case studies highly relevant to current technological challenges in vehicle design. The book presents a novel and accessible insight into a body of knowledge that will enable students, professionals and engineers to add significant value to their work.

Advances in Human Aspects of Transportation: Part II

Human Factors and Ergonomics have made a considerable contribution to the research, design, development, operation and analysis of transportation systems which includes road and rail vehicles and their complementary infrastructure, aviation and maritime transportation. This book presents recent advances in the Human Factors aspects of Transportation. These advances include accident analysis, automation of vehicles, comfort, distraction of drivers (understanding of distraction and how to avoid it), environmental concerns, in-vehicle systems design, intelligent transport systems, methodological developments, new systems and technology, observational and case studies, safety, situation awareness, skill development and training, warnings and workload. This book brings together the most recent human factors work in the transportation domain, including empirical research, human performance and other types of modeling, analysis, and development. The issues facing engineers, scientists, and other practitioners of human factors in transportation research are becoming more challenging and more critical. The common theme across these sections is that they deal with the intersection of the human and the system. Moreover, many of the chapter topics cross section boundaries, for instance by focusing on function allocation in NextGen or on the safety benefits of a tower controller tool. This is in keeping with the systemic nature of the problems facing human factors experts in rail and road, aviation and maritime research— it is becoming increasingly important to view problems not as isolated issues that can be extracted from the system environment, but as embedded issues that can only be understood as a part of an overall system.

Advances in Human Factors of Transportation

This book discusses the latest advances in research and development, design, operation and analysis of transportation systems and their complementary infrastructures. It reports on both theories and case studies on road and rail, aviation and maritime transportation. Further, it covers a wealth of topics, from accident analysis, vehicle intelligent control, and human-error and safety issues to next-generation transportation systems, model-based design methods, simulation and training techniques, and many more. A special emphasis is placed on smart technologies and automation in transport, and on the

user-centered, ergonomic and sustainable design of transport systems. The book, which is based on the AHFE 2019 International Conference on Human Factors in Transportation, held on July 24-28, 2019, in Washington D.C., USA, mainly addresses the needs of transportation system designers, industrial designers, human-computer interaction researchers, civil and control engineers, as well as vehicle system engineers. Moreover, it represents a timely source of information for transportation policy-makers and social scientists whose work involves traffic safety, management, and sustainability issues in transport.

Advances in Human Performance and Cognitive Engineering Research

Human Factors and Ergonomics have made a considerable contribution to the research, design, development, operation and analysis of transportation systems which includes road and rail vehicles and their complementary infrastructure, aviation and maritime transportation. This book presents recent advances in the Human Factors aspects of Transportation. These advances include accident analysis, automation of vehicles, comfort, distraction of drivers (understanding of distraction and how to avoid it), environmental concerns, in-vehicle systems design, intelligent transport systems, methodological developments, new systems and technology, observational and case studies, safety, situation awareness, skill development and training, warnings and workload. This book brings together the most recent human factors work in the transportation domain, including empirical research, human performance and other types of modeling, analysis, and development. The issues facing engineers, scientists, and other practitioners of human factors in transportation research are becoming more challenging and more critical. The common theme across these sections is that they deal with the intersection of the human and the system. Moreover, many of the chapter topics cross section boundaries, for instance by focusing on function allocation in NextGen or on the safety benefits of a tower controller tool. This is in keeping with the systemic nature of the problems facing human factors experts in rail and road, aviation and maritime research— it is becoming increasingly important to view problems not as isolated issues that can be extracted from the system environment, but as embedded issues that can only be understood as a part of an overall system.

Advances in Human Aspects of Transportation: Part I

This volume explores cognitive ergonomics, which is concerned with mental processes—otherwise known as brain work. It discusses perception, memory, reasoning, and motor response, as they affect interactions among humans and other elements of a system. Topics will include mental workload, decision-making, skilled performance, human-computer interaction, human reliability, work stress and training as these relate to human-system design.

Management

This book focuses on computational modeling and simulation research that advances the current state-of-the-art regarding human factors in this area. It reports on cutting-edge simulators such as virtual and augmented reality, on multisensory environments, and on modeling and simulation methods used in various applications, including surgery, military operations, occupational safety, sports training, education, transportation and robotics. Based on the AHFE 2018 International Conference on Human Factors in Simulation and Modeling, held on July 21–25, 2018, in Orlando, Florida, USA, the book serves as a timely reference guide for researchers and practitioners developing new modeling and simulation tools for analyzing or improving human performance. It also offers a unique resource for modelers seeking insights into human factors research and more feasible and reliable computational tools to foster advances in this exciting research field.

Management: A Bibliography for NASA Managers

This text explores some of the key human performance issues facing organizations as they implement or manage automated systems, it deals with a range of topics, such as how to design optional use, avoiding misuse and creating training strategies for automated systems.

Advances in Cognitive Engineering and Neuroergonomics

This book discusses the latest advances in research and development, design, operation and analysis of transportation systems and their complementary infrastructures. It reports on both theories and case studies on road and rail, aviation and maritime transportation. The book covers a wealth of topics, from

accident analysis, vehicle intelligent control, and human-error and safety issues to next-generation transportation systems, model-based design methods, simulation and training techniques, and many more. A special emphasis is given to smart technologies and automation in transport, as well as to user-centered, ergonomic and sustainable design of transport systems. The book, which is based on the AHFE 2016 International Conference on Human Factors in Transportation, held on July 27-31, 2016, in Walt Disney World®, Florida, USA, mainly addresses transportation system designers, industrial designers, human-computer interaction researchers, civil and control engineers, as well as vehicle system engineers. Moreover, it represents a timely source of information for transportation policy-makers and social scientists dealing with traffic safety, management, and sustainability issues in transport.

NASA SP-7500

This book discusses the latest advances in research and development, design, operation and analysis of transportation systems and their complementary infrastructures. It reports on both theories and case studies on road and rail, aviation and maritime transportation. The book covers a wealth of topics, from accident analysis, vehicle intelligent control, and human-error and safety issues to next-generation transportation systems, model-based design methods, simulation and training techniques, and many more. A special emphasis is given to smart technologies and automation in transport, as well as to user-centered, ergonomic and sustainable design of transport systems. The book, which is based on the AHFE 2017 International Conference on Human Factors in Transportation, held on July 17–21, Los Angeles, California, USA, mainly addresses transportation system designers, industrial designers, human-computer interaction researchers, civil and control engineers, as well as vehicle system engineers. Moreover, it represents a timely source of information for transportation policy-makers and social scientists dealing with traffic safety, management, and sustainability issues in transport.

Advances in Human Factors in Simulation and Modeling

This two-volume set addresses a variety of human factors issues and engineering concerns across various real-world applications such as aviation and driving, cybersecurity, and healthcare systems. The contents of these books also present recent theories and methods related to human performance, workload and usability assessment in automated and autonomous systems. In this set, the authors discuss both current and developing topics of advanced automation technologies and present emerging practical challenges. Topics covered include unmanned aerial systems and self-driving cars, individual and team performance, human-robot interaction, and operator selection and training. Both practical and theoretical discussions of modern automated and autonomous systems are provided throughout each of the volumes. These books are suitable for those first approaching the issues to those well versed in these fast-moving areas, including students, teachers, researchers, engineers, and policy makers alike. Volume 1 - Human Performance in Automated and Autonomous Systems: Current Theory and Methods Volume 2 - Human Performance in Automated and Autonomous Systems: Emerging Issues and Practical Perspectives

Automation

This book discusses the latest advances in research and development, design, operation and analysis of transportation systems and their complementary infrastructures. It reports on both theories and case studies on road and rail, aviation and maritime transportation. Further, it covers a wealth of topics, from accident analysis, vehicle intelligent control, and human-error and safety issues to next-generation transportation systems, model-based design methods, simulation and training techniques, and many more. A special emphasis is placed on smart technologies and automation in transport, and on the user-centered, ergonomic and sustainable design of transport systems. The book, which is based on the AHFE 2018 International Conference on Human Factors in Transportation, held in Orlando, Florida, USA on July 21–25, 2018, mainly addresses the needs of transportation system designers, industrial designers, human-computer interaction researchers, civil and control engineers, as well as vehicle system engineers. Moreover, it represents a timely source of information for transportation policy-makers and social scientists whose work involves traffic safety, management, and sustainability issues in transport.

Advances in Human Aspects of Transportation

Human Factors and Ergonomics have made a considerable contribution to the research, design, development, operation and analysis of transportation systems which includes road and rail vehicles and their complementary infrastructure, aviation and maritime transportation. This book presents recent advances in the Human Factors aspects of Transportation. These advances include accident analysis, automation of vehicles, comfort, distraction of drivers (understanding of distraction and how to avoid it), environmental concerns, in-vehicle systems design, intelligent transport systems, methodological developments, new systems and technology, observational and case studies, safety, situation awareness, skill development and training, warnings and workload. This book brings together the most recent human factors work in the transportation domain, including empirical research, human performance and other types of modeling, analysis, and development. The issues facing engineers, scientists, and other practitioners of human factors in transportation research are becoming more challenging and more critical. The common theme across these sections is that they deal with the intersection of the human and the system. Moreover, many of the chapter topics cross section boundaries, for instance by focusing on function allocation in NextGen or on the safety benefits of a tower controller tool. This is in keeping with the systemic nature of the problems facing human factors experts in rail and road, aviation and maritime research— it is becoming increasingly important to view problems not as isolated issues that can be extracted from the system environment, but as embedded issues that can only be understood as a part of an overall system.

Advances in Human Aspects of Transportation

The Cambridge Handbook of Applied Perception Research covers core areas of research in perception with an emphasis on its application to real-world environments. Topics include multisensory processing of information, time perception, sustained attention, and signal detection, as well as pedagogical issues surrounding the training of applied perception researchers. In addition to familiar topics, such as perceptual learning, the Handbook focuses on emerging areas of importance, such as human-robot coordination, haptic interfaces, and issues facing societies in the twenty-first century (such as terrorism and threat detection, medical errors, and the broader implications of automation). Organized into sections representing major areas of theoretical and practical importance for the application of perception psychology to human performance and the design and operation of human-technology interdependence, it also addresses the challenges to basic research, including the problem of quantifying information, defining cognitive resources, and theoretical advances in the nature of attention and perceptual processes.

Human Performance in Automated and Autonomous Systems, Two-Volume Set

This book discusses the latest advances in the research and development, design, operation, and analysis of transportation systems, including road, rail, aviation, aerospace and maritime as well as their supporting systems and infrastructure. Focusing specifically on the contributions made by human factors and ergonomics, it analyses a wealth of topics, methods and technologies associated to accident analysis, automated and autonomous vehicles, assessment of comfort and distraction of drivers, and environmental concerns, giving emphasis to intelligent transport systems and driver-assistance systems, among other topics. Based on contributions to the AHFE 2021 Conference on Human Aspects of Transportation, held virtually on July 25-29, 2021, from USA, this book offers extensive information on the latest human factors and ergonomics thinking and practice in the area of transportation, and a thought-provoking guide to researchers, graduate students and professionals in this field.

Advances in Human Aspects of Transportation

In 2000, the Conference on Automation joined forces with a partner group on situation awareness (SA). The rising complexity of systems demands that one can be aware of a large range of environmental and task-based stimulation in order to match what is done with what has to be done. Thus, SA and automation-based interaction fall naturally together and this conference is the second embodiment of this union. Moving into the 21st century, further diversification of the applications of automation will continue—for example, the revolution in genetic technology. Given the broad nature of this form of human-machine interaction, it is vital to apply past lessons to map a future for the symbiotic relationship between humans and the artifacts they create. It is as part of this ongoing endeavor that the present volume is offered.

Advances in Human Aspects of Transportation: Part III

This book discusses the latest advances in the research and development, design, operation, and analysis of transportation systems and their corresponding infrastructures. It presents both theories and case studies on road and rail, aviation, and maritime transportation. Further, it covers a wealth of topics, from accident analysis, intelligent vehicle control, and human-error and safety issues to next-generation transportation systems, model-based design methods, simulation and training techniques, and many more. Special emphasis is placed on smart technologies and automation in transport, as well as the user-centered, ergonomic, and sustainable design of transportation systems. The book, which is based on the AHFE 2020 Virtual Conference on Human Aspects of Transportation, held on July 16–20, 2020, mainly addresses the needs of transportation system designers, industrial designers, human–computer interaction researchers, civil and control engineers, as well as vehicle system engineers. Moreover, it represents a timely source of information for transportation policy-makers and social scientists whose work involves traffic safety, management, and sustainability issues in transport.

The Cambridge Handbook of Applied Perception Research

Automobile Automation tackles the Human Factors issues associated with the roles left over for the driver of highly automated vehicles. Modeling the distributed cognition of the driver-vehicle automation interactions, Banks and Stanton show that, ironically, there can be more mental work for the driver when vehicle sub-systems are automated. They also show human performance decrements associated with driving automated vehicles in simulator, test track and on-road studies. Clearly, there are many Human Factors issue still to be resolved, making this book essential reading for designers, engineers and researchers in Automobile Automation. Book jacket.

Advances in Human Aspects of Transportation

Human Factors in Intelligent Vehicles addresses issues related to the analysis of human factors in the design and evaluation of intelligent vehicles for a wide spectrum of applications and over different dimensions. To commemorate the 8th anniversary of the IEEE ITS Workshop on Human Factors (<http://hfiv.net>) some recent works of authors active in the automotive human factors community have been collected in this book. Enclosed here are extended versions of papers and tutorials that were presented at the IEEE ITSS Workshop on “Human Factors in Intelligent Vehicles” and also included is additional deeper analysis along with detailed experimental and simulation results. The contributors cover autonomous vehicles as well as the frameworks for analyzing automation, modelling and methods for road users’ interaction such as intelligent user interfaces, including brain-computer interfaces and simulation and analysis tools related to human factors.

Human Performance, Situation Awareness, and Automation

The commonly used terms, "unmanned" or "uninhabited," are misleading in the context of remotely operated vehicles. In the case of Unmanned Aerial Vehicles (UAVs), there are many people involved on the ground ranging from those operating the vehicle from a ground control station, to the people coordinating multiple UAVs in an air operations or air traffic control center. The complexity of remote vehicle operations is also often underestimated and seen as a simple navigation task, neglecting the more complex functions associated with remote camera operations, data gathering, and even weapons activity. In addition, trends in the military and civilian sectors involving reduced staffing, increased number of vehicles to control, and integration with other operations are associated with critical human factors issues. For example, the integration of UAVs with manned aircraft in the national airspace poses numerous human factors challenges. In summary, though these vehicles may be unmanned they are not unoperated, unsupervised, or uncontrolled. The role of the human in these systems is critical and raises a number of human factors research and design issues ranging from multiple vehicle control and adaptive automation to spatial disorientation and synthetic vision. The purpose of this book is to highlight the pressing human factors issues associated with remotely operated vehicles and to showcase some of the state of the art human-oriented research and design that speaks to these issues. In this book the human components of the "unmanned" system take center stage compared to the vehicle technology that often captures immediate attention.

Advances in Human Aspects of Transportation

The Intelligent Transportation System (ITS) Program is a cooperative effort by government, private industry, and academia to apply advanced technology to the task of resolving the problems of surface transportation. The objective is to improve travel efficiency and mobility, enhance safety, conserve

energy, provide economic benefits, and protect the environment. The current demand for mobility has exceeded the available capacity of the roadway system. Because the highway system cannot be expanded, except in minor ways, the available capacity must be used more efficiently to handle the increased demand. ITS applies advanced information processing, communication, sensing, and computer control technologies to the problems of surface transportation. Considerable research and development efforts will be required to produce these new technologies and to convert technologies developed in the defense and space programs to solve surface transportation problems. ITS has been subdivided into six interlocking technology areas. This book addresses human factors concerns for four of these areas: * Advanced Traveler Information Systems are a variety of systems that provide real time, in-vehicle information to drivers regarding navigation and route guidance, motorist services, roadway signing, and hazard warnings. * Advanced Vehicle Control Systems refer to systems that aid drivers in controlling their vehicle particularly in emergency situations and ultimately taking over some or all of the driving tasks. * Commercial Vehicle Operations address the application of ITS technologies to the special needs of commercial roadway vehicles including automated vehicle identification, location, weigh-in-motion, clearance sensing, and record keeping. * Advanced Traffic Management Systems monitor, control and manage traffic on streets and highways to reduce congestion using vehicle route diversion, automated signal timing, changeable message signs, and priority control systems. Two technical areas are not specifically addressed in individual chapters, but many aspects of them are covered in associated chapters: * Advanced Rural Transportation Systems include systems that apply ITS technologies to the special needs of rural systems and include emergency notification and response, vehicle location, and traveler information. * Advanced Public Transportation Systems enhance the effectiveness, attractiveness and economics of public transportation and include fleet management, automated fare collection, and real-time information systems.

Automobile Automation

This completely revised edition, of the Handbook of Human-Computer Interaction, of which 80% of the content is new, reflects the developments in the field since the publication of the first edition in 1988. The handbook is concerned with principles for design of the Human-Computer Interface, and has both academic and practical purposes. It is intended to summarize the research and provide recommendations for how the information can be used by designers of computer systems. The volume may also be used as a reference for teaching and research. Professionals who are involved in design of HCI will find this volume indispensable, including: computer scientists, cognitive scientists, experimental psychologists, human factors professionals, interface designers, systems engineers, managers and executives working with systems development. Much of the information in the handbook may also be generalized to apply to areas outside the traditional field of HCI.

Human Factors in Intelligent Vehicles

Even to the casual observer of the automotive industry, it is clear that driving in the 21st century will be radically different from driving as we know it today. Significant advances in diverse technologies such as digital maps, communication links, processors, image processing, chipcards, traffic management, and vehicle positioning and tracking, are enabling extensive development of intelligent transport systems (ITS). Proponents of ITS view these technologies as freeing designers to re-define the role and function of transport in society and to address the urgent problems of congestion, pollution, and safety. Critics, on the other hand, worry that ITS may prove too complex, too demanding, and too distracting for users, leading to loss of skill, increased incidence of human error, and greater risk of accidents. The role of human factors is widely acknowledged to be critical to the successful implementation of such technologies. However, too little research is directed toward advancing the science of human-ITS interaction, and too little is published which is useful to system designers. This book is an attempt to fill this critical gap. It focuses on the intelligent driver interface (IDI) because the ergonomics of IDI design will influence safety and usability perhaps more than the technologies which underlie it. The chapters cover a broad range of topics, from cognitive considerations in the design of navigation and route guidance, to issues associated with collision warning systems, to monitoring driver fatigue. The chapters also differ in intent -- some provide design recommendations while others describe research findings or new approaches for IDI research and development. Based in part on papers presented at a symposium on the ergonomics of in-vehicle human systems held under the auspices of the 12th Congress of the International Ergonomics Association, the book provides an international perspective on related topics through inclusion of important contributions from Europe, North America, and Japan. Many of the chapters discuss issues associated with navigation and route guidance because such

systems are the most salient and arguably the most complex examples of IDI. However, the findings and research methodologies are relevant to other systems as well, making this book of interest to a wide audience of researchers, design engineers, transportation authorities, and academicians involved with the development or implementation of ITS.

Human Factors of Remotely Operated Vehicles

Forming connections between human performance and design Engineering Psychology and Human Performance, 4e examines human-machine interaction. The book is organized directly from the psychological perspective of human information processing. The chapters generally correspond to the flow of information as it is processed by a human being--from the senses, through the brain, to action--rather than from the perspective of system components or engineering design concepts. This book is ideal for a psychology student, engineering student, or actual practitioner in engineering psychology, human performance, and human factors Learning Goals Upon completing this book, readers should be able to: * Identify how human ability contributes to the design of technology. * Understand the connections within human information processing and human performance. * Challenge the way they think about technology's influence on human performance. * show how theoretical advances have been, or might be, applied to improving human-machine interaction

Human Factors in Intelligent Transportation Systems

This book reports on cutting-edge research into innovative system interfaces, highlighting both lifecycle development and human–technology interaction, especially in virtual, augmented and mixed-reality systems. It describes advanced methodologies and tools for evaluating and improving interface usability and discusses new models, as well as case studies and good practices. The book addresses the human, hardware, and software factors in the process of developing interfaces for optimizing total system performance, while minimizing their costs. It also highlights the forces currently shaping the nature of computing and systems, such as: the importance of portability and technologies for reducing power requirements; the necessity of a better assimilation of computation in the environment; as well as solutions to promote accessibility to computers and systems for people with special needs. The book, which is based on the AHFE 2019 International Conference on Human Factors and Systems Interaction, held on July 24-28, 2019, in Washington D.C., USA, offers a timely survey and practice-oriented guide for systems interface users and developers alike.

Handbook of Human-Computer Interaction

This book reports on cutting-edge research into innovative system interfaces, highlighting both lifecycle development and human–technology interaction, especially in virtual, augmented and mixed-reality systems. It describes advanced methodologies and tools for evaluating and improving interface usability and discusses new models, as well as case studies and good practices. The book addresses the human, hardware, and software factors in the process of developing interfaces for optimizing total system performance, particularly innovative computing technologies for teams dealing with dynamic environments, while minimizing total ownership costs. It also highlights the forces currently shaping the nature of computing and systems, including the need for decreasing hardware costs; the importance of portability, which translates to the modern tendency toward hardware miniaturization and technologies for reducing power requirements; the necessity of a better assimilation of computation in the environment; and social concerns regarding access to computers and systems for people with special needs. The book, which is based on the AHFE 2018 International Conference on Human Factors and Systems Interaction, held on July 21–25, 2018, in Orlando, Florida, USA, offers a timely survey and practice-oriented guide for systems interface users and developers alike.

Ergonomics and Safety of Intelligent Driver Interfaces

This book constitutes the proceedings of the 17th International Conference on Engineering Psychology and Cognitive Ergonomics, EPCE 2020, held as part of the 22nd International Conference, HCI International 2020, which took place in Copenhagen, Denmark, in July 2020. The total of 1439 papers and 238 posters included in the 37 HCII 2020 proceedings volumes was carefully reviewed and selected from 6326 submissions. EPCE 2020 includes a total of 60 regular papers; they were organized in topical sections named: mental workload and performance; human physiology, human energy and cognition; cognition and design of complex and safety critical systems; human factors in human autonomy teaming and intelligent systems; cognitive psychology in aviation and automotive. As a result of the Danish

Government's announcement, dated April 21, 2020, to ban all large events (above 500 participants) until September 1, 2020, the HCII 2020 conference was held virtually.

Engineering Psychology and Human Performance

Advances in Human Factors and Systems Interaction