Ergonomics In The Automotive Design Process

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Designing Interaction and Interfaces for Automated Vehicles
Automotive Vehicle Safety
Human Factors in Automotive Engineering and Technology
Handbook of Human Factors and Ergonomics

VILLARREAL ALVARADO

Automotive Ergonomics CRC Press
The fourth edition of the Handbook of Human Factors and Ergonomics has been completely revised and updated. This includes all existing third edition chapters plus new chapters written to cover new areas. These include the following subjects: Managing low-back disorder risk in the workplace Online interactivity Neuroergonomics Office ergonomics Social networking HF&E in motor vehicle transportation User requirements Human factors and ergonomics in aviation Human factors in ambient intelligent environments As with the earlier editions, the main purpose of this handbook is to serve the needs of the human factors and ergonomics researchers, practitioners, and graduate students. Each chapter has a strong theory and scientific base, but is heavily focused on real world applications. As such, a significant number of case studies, examples, figures, and tables are included to aid in the understanding and application of the material covered.

The Application of Ergonomics in the Design of Automotive Displays Springer
Ergonomics teaches how to design technology in such a way that it is optimally adapted to the needs, wishes and characteristics of the user. In this context, the concept of the human-machine system has become established. In a systematic way and with a detailed view of the complicated technical and perceptual psychological and methodological connections, this book explains the basics of automotive ergonomics with numerous examples. The application is shown in examples such as package, design of displays and control elements, of environmental ergonomics such as lighting, sound, vibrations, climate and smell. The design of driver assistance systems from an ergonomic perspective is also a central topic. The book is rounded off by methods of ergonomic vehicle development, the use of mock-ups, driving simulators and tests in real vehicles and prototypes. For the first time, those responsible in the automotive industry and in the field of relevant research are provided with a specialized systematic work that provides the ergonomic findings in the design of today's automobiles. This provides planners and designers of today's automobiles with concrete information for ergonomic product

development, enabling them to keep an eye on decisive requirements and subsequent customer acceptance. This book is a translation of the original German 1st edition Automobilergonomie by Heiner Bubb, Klaus Bengler, Rainer E. Grünen & Mark Vollrath, published by Springer Fachmedien Wiesbaden GmbH, part of Springer Nature in 2015. The translation was done with the help of artificial intelligence (machine translation by the service DeepL.com). A subsequent human revision was done primarily in terms of content, so that the book will read stylistically differently from a conventional translation. Springer Nature works continuously to further the development of tools for the production of books and on the related technologies to support the authors.

Automotive Ergonomics CRC Press

An Introduction to Modern Vehicle Design provides a thorough introduction to the many aspects of passenger car design in one volume. Starting with basic principles, the author builds up analysis procedures for all major aspects of vehicle and component design. Subjects of current interest to the motor industry, such as failure prevention, designing with modern materials, ergonomics and control systems are covered in detail, and the author concludes with a discussion on the future trends in automobile design. With contributions from both academics lecturing in motor vehicle engineering and those working in the industry, "An Introduction to Modern Vehicle Design" provides students with an excellent overview and background in the design of vehicles before they move on to specialised areas. Filling the niche between the more descriptive low level books and books which focus on specific areas of the design process, this unique volume is essential for all students of automotive engineering. Only book to cover the broad range of topics for automobile design and analysis procedures Each topic written by an expert with many years experience of the automotive industry

Ergonomics in Product Design SAE International

The auto industry is facing tough competition and severe economic constraints. Their products need to be designed "right the first time" with the right combinations of features that not only satisfy the customers but continually please and delight them by providing increased functionality, comfort, convenience, safety, and craftsmanship. Based on the author's forty plus years of experience as a human factors researcher, engineer, manager, and teacher who has conducted numerous studies and analyses, Ergonomics in the Automotive Design Process covers the entire range of ergonomics issues involved in designing a car or truck and provides evaluation techniques to avoid costly mistakes and assure high customer satisfaction. The book begins with the definitions and goals of ergonomics, historic background, and ergonomics approaches. It covers human characteristics, capabilities, and limitations considered in vehicle design in key areas such as anthropometry, biomechanics, and human information processing. It then examines how the driver and the occupants are positioned in the vehicle space and how package drawings and/or computer-aided design models are created from key vehicle dimensions used in the automobile industry. The author describes design tools used in the industry for occupant packaging, driver vision, and applications of other psychophysical methods. He covers important driver information processing concepts and models and driver error categories to understand key considerations and principles used in designing controls, displays, and their usages, including current issues related to driver workload and driver distractions. The author has included only the topics and materials that he found to be useful in designing car and truck products and concentrated on the ergonomic issues generally discussed in the automotive design studios and product development teams. He distills the information needed to be a member of an automotive product development team and create an ergonomically superior vehicle.

The Multisensory Driver CRC Press

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.

Ergonomics in the Automotive Design Process CRC Press

A complete introduction to the field, Ergonomics: Foundational Principles, Applications and Technologies discusses scientific principles, research, applications, and emerging trends in technology. Covering the foundational principles and major topics in physical ergonomics, the book contains the necessary components of a quality ergonomics course,

Ergonomics and Safety of Intelligent Driver Interfaces CRC Press

A potentially troubling aspect of modern vehicle design – some would argue - is a trend for isolating the driver and reducing vehicle feedback, usually in the name of comfort and refinement but increasingly because of automation. There is little doubt cars have become more civilised over the years, yet despite this, the consequences of driver behaviour remain to a large extent anecdotal. Readers will have heard such anecdotes for themselves. They usually take the form of drivers of a certain age recalling their first cars from the 1970s or 80s, in which "doing 70 mph really felt like it". The question is whether such anecdotes actually reflect a bigger, more significant issue that could be better understood. Related questions have been explored in other domains such as aviation, where the change to ‘fly-by-wire’ did indeed bring about some occasionally serious performance issues that were not anticipated. Despite some clear parallels, automotive systems have been left relatively unstudied. The research described in this book aims to explore precisely these issues from a Human Factors perspective. This means connecting the topics of vehicle feel, vehicle dynamics, and automotive engineering with the latest research on driver situation awareness. The problem is explored experimentally from a variety of theoretical viewpoints but the outcomes are consistently practical. Here we have a promising new avenue along which the driver experience can be enhanced in novel and insightful ways. Tools and templates are provided so that engineers and designers can try different ways to boost vehicle safety, efficiency and enjoyment from a human-centered perspective. Association of American Publishers (AAP) Finalist for the 2019 PROSE Award Features Diagnosis of how vehicle feel impacts driver situation awareness, and how this could aid future vehicle designs Multi-theory approach to driver situation awareness, and how different views of this important concept give rise to different insights Comprehensive analysis of situation awareness in driving, the information requirements of drivers, and how these needs can be supported Practical descriptions of how state-of-science Human Factors methods have been applied in practice

Ergonomics and Car Design [excerpts]. Springer Nature

An Introduction to Modern Vehicle Design starts from basic principles and builds up analysis procedures for all major aspects of vehicle and component design. Subjects of current interest to

the motor industry - such as failure prevention, designing with modern material, ergonomics, and control systems - are covered in detail, with a final chapter discussing future trends in automotive design. Extensive use of illustrations, examples, and case studies provides the reader with a thorough understanding of design issues and analysis methods.

Automotive Ergonomics CRC Press

This book is about how to develop future automotive products by applying the latest methodologies based on a systems engineering approach and by taking into account many issues facing the auto industry such as meeting government safety, emissions and fuel economy regulations, incorporating advances in new technology applications in structural materials, power trains, vehicle lighting systems, displays and telematics, and satisfying the very demanding customer. It is financially disastrous for any automotive company to create a vehicle that very few people want. To design an automotive product that will be successful in the marketplace requires carefully orchestrated teamwork of experts from many disciplines, substantial amount of resources, and application of proven techniques at the right time during the product development process. Automotive Product Development: A Systems Engineering Implementation is intended for company management personnel and graduate students in engineering, business management and other disciplines associated with the development of automotive and other complex products.

Ergonomics and Safety in Hand Tool Design Elsevier

Automotive Vehicle Safety is a unique academic text, practical design guide and valuable reference book. It provides information that is essential for specialists to make better-informed decisions. The book identifies and discusses key generic safety principles and their applications and includes decision-making criteria, examples and remedies. It

Ergonomics CRC Press

This book is about how to develop future automotive products by applying the latest methodologies based on a systems engineering approach and by taking into account many issues facing the auto industry such as meeting government safety, emissions and fuel economy regulations, incorporating advances in new technology applications in structural materials, power trains, vehicle lighting systems, displays and telematics, and satisfying the very demanding customer. It is financially disastrous for any automotive company to create a vehicle that very few people want. To design an automotive product that will be successful in the marketplace requires carefully orchestrated teamwork of experts from many disciplines, substantial amount of resources, and application of proven techniques at the right time during the product development process. Automotive Product Development: A Systems Engineering Implementation is intended for company management personnel and graduate students in engineering, business management and other disciplines associated with the development of automotive and other complex products.

Automotive Human Centred Design Methods CRC Press

This important book focuses on the role of human factors in the design and use of automobiles. It should review current knowledge of human characteristics as related to passenger car design and thus serve as a basis for new car design and design evaluation. Comprehensive and accessible, the book is organized around the following themes: human capabilities and limitations in car design - anthropometry, biomechanics, human vision, motorskills, and cognition; the physical aspects of car design - occupant packaging', entry and egress, seating, luggage loading, occupant protection, thermal environment; informational aspects of design - displays and controls, HUDS, icons, warnings, vehicle lighting and sounds; and special topics such as driving performance models, driver workload, older drivers, and computer-aided ergonomic design.; It is Aimed At Automotive Designers, Government Agencies Concerned With Car passenger transport issues and the ergonomics research community.

Advances in Ergonomics in Design CRC Press

The auto industry is facing tough competition and severe economic constraints. Their products need to be designed "right the first time" with the right combinations of features that not only satisfy the customers but continually please and delight them by providing increased functionality, comfort, convenience, safety, and craftsmanship. Based on t

Introduction to Modern Vehicle Design Springer Nature

In the last 20 years, technological developments have set new standards in driver-vehicle interaction. These developments effect the entire lifecycle, from the moment a customer enters a dealership to examine a prospective vehicle, to the driving experience during the vehicle lifecycle, and the interaction with other road users and facilities in pl

Design for Transport Elsevier

This book presents the proceedings of the 21st Congress of the International Ergonomics Association (IEA 2021), held online on June 13-18, 2021. By highlighting the latest theories and models, as well as cutting-edge technologies and applications, and by combining findings from a range of disciplines including engineering, design, robotics, healthcare, management, computer science, human biology and behavioral science, it provides researchers and practitioners alike with a comprehensive, timely guide on human factors and ergonomics. It also offers an excellent source of innovative ideas to stimulate future discussions and developments aimed at applying knowledge and techniques to optimize system performance, while at the same time promoting the health, safety and wellbeing of individuals. The proceedings include papers from researchers and practitioners, scientists and physicians, institutional leaders, managers and policy makers that contribute to constructing the Human Factors and Ergonomics approach across a variety of methodologies, domains and productive sectors. This volume includes papers addressing the following topics: Activity Theories for Work Analysis and Design (ATWAD), Organisation design and management (ODAM), Ergonomic Work Analysis and Training (EWAT), Systems HF/E, HF/E Education and Professional Certification Development.

Modelling Driver Behaviour in Automotive Environments CRC Press

Automotive design continues to evolve at a rapid pace. As electric cars become ever more commonplace on the roads to the advent of the driverless vehicle, understanding the ergonomics behind automotive engineering becomes ever more paramount. Vehicle attributes must be considered early during the new vehicle development program by coordinated work of multi-disciplinary teams to begin creating vehicle specifications and development of vehicle attribute requirements. In Ergonomics in the Automotive Design Process: Concepts, Issues and Methods, Vivek D. Bhise covers the need-to-know fundamentals as to what makes an ergonomically sound vehicle. This book covers the entire range of ergonomics issues involved in designing a car or truck and offers evaluation techniques to avoid costly mistakes and assure high customer satisfaction. Across 13 chapters, vehicle design and the attributes of vehicle handling, appearance (interior and exterior styling), safety and security, infotainment, noise and vibrations, emissions, costs and process compatibility are considered in the context of ergonomics. New material to this edition includes coverage of ergonomics in the systems engineering process, decision-making and risks in automotive

product programs and ergonomic considerations in electric vehicle development. This book will allow the reader to develop a more comprehensive knowledge of issues facing the developers of automotive products and delivers methods to manage communication, coordination and integration processes. It provides more tools in implementing systems engineering to minimize the risks of delays and cost overruns, and most importantly, creates the right product for its customers. The reader will develop a knowledge of future in- vehicle devices that are easy to program and use, safe, cheap to manufacture and assemble and are eco-friendly From an author with over forty years of experience in automotive design, this title is an ideal read for students and practitioners of ergonomics, human factors, automotive design, civil engineering, product design, work design and mechanical engineering. Vivek D. Bhise is currently a LEO Lecturer/ Visiting Professor and a Professor in post-retirement of Industrial and Manufacturing Systems Engineering at the University of Michigan-Dearborn. He received his B.Tech. in Mechanical Engineering (1965) from the Indian Institute of Technology, Bombay, India, M.S. in Industrial Engineering (1966) from the University of California, Berkeley, and PhD in Industrial and Systems Engineering (1971) from the Ohio State University, Columbus, Ohio. During 1973 to 2001, he held several management and research positions at the Ford Motor Company in Dearborn, Michigan.

Proceedings of the 21st Congress of the International Ergonomics Association (IEA 2021) Springer Science & Business Media

Emphasizing customer oriented design and operation, Introduction to Human Factors and Ergonomics for Engineers explores the behavioral, physical, and mathematical foundations of the discipline and how to apply them to improve the human, societal, and economic well being of systems and organizations. The book discusses product design, such as tools,

Ergonomics CRC Press

Discusses ergonomics in designing passenger facilities in automobiles to improve body support, visibility, ease of operation, safety, and other factors. Among the 31 perspectives are the distribution of automobile trip durations for studies of seat comfort, locating the pelvis in the seated driver, the newness retention of textile automotive seat covers, a new form of the cut-off zone for low-beam headlights, replacing parabolic reflectors by free-form versions, reaction forces of switches and push feeling, and the feature detection of driving actions. Reproduced from papers delivered at a February 1996 international congress in Detroit. Annotation copyrighted by Book News, Inc., Portland, OR

Ergonomics for Children CRC Press

This book presents seven case studies in which digital human models were used to solve different types of physical problems associated with proposed human-machine interaction tasks. This book includes contributions from researchers at Ford, Boeing, DaimlerChrysler, General Motors, the U.S. Air Force, and others.

Ergonomics and Safety in Motor Car Design CRC Press

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.

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