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Foreword to the 11th Edition

Automotive engineering has become an extremely complex field over the last few years and decades. It is becoming increasingly more difficult to command an overview of the entire field and to maintain constant access to the subjects which are significant to automotive engineering. Many of these new subjects have in the meantime been covered in great detail in the wealth of available specialist literature. However, for those readers who wish to approach one of these new subjects for the first time, the available literature is neither easily manageable nor is it readable within the available timeframe.

This is where the Automotive Handbook comes in useful. It is structured in such a way as to be easily accessible even to those readers who are new to any individual subject. The most important subjects relevant to automotive engineering have been compiled in a compact, easily understandable, and practically relevant form. This is possible because the contents have been written by experts who work at Bosch, at other automotive companies and suppliers, and in the university sector in the very specialist fields presented.

In this the 11th Edition in English many subjects have been included for the first time, completely revised or enhanced. The subjects revised have centered on electrification of the drive. The Handbook has however also been revised, expanded and updated in many other places to make the contents even more understandable to the reader. Thus, the subject of artificial intelligence, which is used in many fields, has been included. More than 260 pages have been added to this latest edition. In spite of the large number of contributing authors, every effort has been made to provide a uniform presentation and to maintain consistent classifications and nomenclature within its pages.

This individual chapters of this publication have been laid out gradually on receipt of the authors' manuscripts. Care has been taken to ensure that the graphics where possible are positioned in such a way that they appear with the accompanying text on the same page or the facing page and consequently both are visible to the reader in a single glance. Shifting the pagination at a later stage by one page would undo this text/graphic reference. This does however mean that there are blank pages in some places.

This latest edition could not have been completed without the outstanding support of many individuals. Firstly, we would like to thank the authors of the individual articles, who, with great care and patience, have succeeded in delivering on schedule chapters of the highest substance and quality. Finally, we would like to thank all those readers who have provided useful suggestions and advice on corrections.

Friedrichshafen and Karlsruhe, January 2022,

Scientific advisory board
and editorship

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 Prof. Dr.-Ing. Peter Knoll

Radar-sensor system
 Dipl.-Ing. Joachim Selinger,
 M. Sc. (University of Colorado)
 Dr.-Ing. Michael Schoor

Lidar-sensor system
 Dr.-Ing. Jan Sparbert

Video sensors
 Dr. sc. Moritz Eßlinger
 Christian Schwarz, M. Sc.
 Dr.-Ing. Stjepan Dujmovic

Sensor-data fusion
 PD Dr.-Ing. habil. Alexandru Paul
 Condurache
 Dr.-Ing. André Treptow

Driver-assistance systems

Vehicle navigation
 Dipl.-Ing. Ernst Peter Neukirchner

Night-vision systems
 Prof. Dr.-Ing. Peter Knoll

Parking and maneuvering systems
 Prof. Dr.-Ing. Peter Knoll

Adaptive Cruise Control
 Dipl.-Ing. Gernot Schröder
 Prof. Dr.-Ing. Peter Knoll

Information and warning systems
 Dipl.-Ing. Karl-Heinz Dietsche
 Dr. Benjamin Schoen

Lane assistance
 Dipl.-Ing. Karl-Heinz Dietsche
 Dr.-Ing. Thomas Michalke
 Dr. rer. nat. Lutz Bürkle

Lane-change assistant
 Dipl.-Ing. Karl-Heinz Dietsche
 Dr.-Ing. Thomas Michalke
 Dr. rer. nat. Lutz Bürkle

Emergency-braking systems
 Dipl.-Ing. Karl-Heinz Dietsche
 Dr.-Ing. Thomas Gussner
 Dr.-Ing. Steffen Knoop
 Dr.-Ing. Falk Hecker,
 Knorr-Bremse SfN, Schwieberdingen

Intersection assistant
 Dipl.-Ing. Karl-Heinz Dietsche
 Dr. rer. nat. Wolfgang Branz
 Dr.-Ing. Rüdiger Jordan

Intelligent headlamp control
 Dipl.-Ing. Doris Boebel,
 Automotive Lighting Reutlingen GmbH
 Dipl.-Ing. (FH) Bernd Dreier,
 Automotive Lighting Reutlingen GmbH
 Dipl.-Ing. Karl-Heinz Dietsche

Advanced rider-assistance systems for two-wheelers
 Dipl.-Ing. Karl-Heinz Dietsche

Interior-monitoring systems
 Dipl.-Ing. Karl-Heinz Dietsche

Future of automated driving

Future of automated driving
 Holger Scharf