



Material-Integrated Intelligent Systems: Technology and Applications

Stefan Bosse (Editor), Dirk Lehmus (Editor), Walter Lang (Editor), Matthias Busse (Editor)

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DESCRIPTION

Combining different perspectives from materials science, engineering, and computer science, this reference provides a unified view of the various aspects necessary for the successful realization of intelligent systems.

The editors and authors are from academia and research institutions with close ties to industry, and are thus able to offer first-hand information here. They adopt a unique, three-tiered approach such that readers can gain basic, intermediate, and advanced topical knowledge. The technology section of the book is divided into chapters covering the basics of sensor integration in materials, the challenges associated with this approach, data processing, evaluation, and validation, as well as methods for achieving an autonomous energy supply. The applications part then goes on to showcase typical scenarios where material-integrated intelligent systems are already in use, such as for structural health monitoring and smart textiles.

ABOUT THE AUTHOR

Stefan Bosse studied physics at the University of Bremen, Germany, from which he also received his PhD. Since 2008 he is actively involved in different projects in the University of Bremen's Scientific Center ISIS (Integrated Solutions in Sensorial Structure Engineering) pushing interdisciplinary research, and recently joined the ISIS council.

Dirk Lehmhus joined the Fraunhofer Institute for Manufacturing Technology and Advanced Materials (IFAM) in Bremen, Germany, in 1998 and subsequently obtained a PhD in production technology from Bremen University for optimization studies of aluminium foam production processes and properties. Since May 2009 he is Managing Director at the University of Bremen's Scientific Centre ISIS dedicated to the development of sensorial materials and sensor-equipped structures.

Walter Lang joined the Fraunhofer Institute for Solid State Technology (EMFT) in Munich, Germany, in 1987 where he worked on microsystems technology. In 1995, he became Head of the Sensors Department in the Institute of Micromachining and Information Technology of the Hahn Schickard Society. In 2003, he joined the University of Bremen where he is currently heading the Institute for Microsensors, -actuators and -systems at the Microsystems Center Bremen.

Matthias Busse holds the chair for near net-shape manufacturing technology in the Faculty of Production Engineering at the University of Bremen since 2003. At the same time, he became Director of the Fraunhofer IFAM. After his PhD in mechanical engineering he worked in various positions at Volkswagen Central Research, ultimately as Head of Production Research. Matthias Busse represents the University of Bremen's Scientific Centre ISIS as speaker of the board of directors.

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