Marwedel

Embedded System Design

Embedded Systems Foundations of Cyber-Physical Systems, and the Internet of Things

A unique feature of this open access textbook is to provide a comprehensive introduction to the fundamental knowledge in embedded systems, with applications in cyber-physical systems and the Internet of things. It starts with an introduction to the field and a survey of specification models and languages for embedded and cyber-physical systems. It provides a brief overview of hardware devices used for such systems and presents the essentials of system software for embedded systems, including real-time operating systems. The author also discusses evaluation and validation techniques for embedded systems and provides an overview of techniques for mapping applications to execution platforms, including multi-core platforms. Embedded systems have to operate under tight constraints and, hence, the book also contains a selected set of optimization techniques, including software optimization techniques. The book closes with a brief survey on testing. This fourth edition has been updated andrevised to reflect new trends and technologies, such as the importance of cyber-physical systems (CPS) and the Internet of things (IoT), the evolution of single-core processors to multi-core processors, and the increased importance of energy efficiency and thermal issues.

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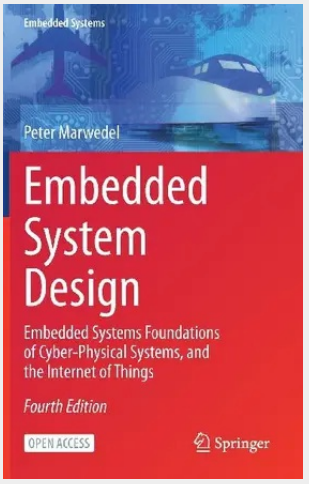

53,49 €
49,99 € (zzgl. MwSt.)

Lieferfrist: bis zu 10 Tage

Artikelnummer: 9783030609092
Medium: Buch
ISBN: 978-3-030-60909-2
Verlag: Palgrave Macmillan
Erscheinungstermin: 26.01.2021
Sprache(n): Englisch
Auflage: Fourth Auflage 2021
Serie: Embedded Systems
Produktform: Gebunden
Gewicht: 800 g
Seiten: 433
Format (B x H): 160 x 241 mm

Kundenservice Verlag Dr. Otto Schmidt KG
Neumannstraße 10, 40235 Düsseldorf | kundenservice@otto-schmidt.de | 0221-93738-997 (Inland)