Real-Time Embedded Systems

Jiacun Wang

 Offering comprehensive coverage of the convergence of real-time embedded systems scheduling, resource access control, software design and development, and high-level system modeling, analysis and verification

Following an introductory overview, Dr. Wang delves into the specifics of hardware components, including processors, memory, I/O devices and architectures, communication structures, peripherals, and characteristics of real-time operating systems. Later chapters are dedicated to real-time task scheduling algorithms and resource access control policies, as well as priority-inversion control and deadlock avoidance. Concurrent system programming and POSIX programming for real-time systems are covered, as are finite state machines and Time Petri nets. Of special interest to software engineers will be the chapter devoted to model checking, in which the author discusses temporal logic and the NuSMV model checking tool, as well as a chapter treating real-time software design with UML. The final portion of the book explores practical issues of software reliability, aging, rejuvenation, security, safety, and power management. In addition, the book:

- Explains real-time embedded software modeling and design with finite state machines, Petri nets, and UML, and real-time constraints verification with the model checking tool, NuSMV
- Features real-world examples in finite state machines, model checking, real-time system design with UML, and more
- Covers embedded computer programing, designing for reliability, and designing for safety
- Explains how to make engineering trade-offs of power use and performance
• Investigates practical issues concerning software reliability, aging, rejuvenation, security, and power management

*Réal-Time Embedded Systems* is a valuable resource for those responsible for real-time and embedded software design, development, and management. It is also an excellent textbook for graduate courses in computer engineering, computer science, information technology, and software engineering on embedded and real-time software systems, and for undergraduate computer and software engineering courses.

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**ABOUT THE AUTHOR**

**Jiacun Wang Ph.D.** is a Professor of Software Engineering at Monmouth University, NJ, USA. He is a former member of the scientific staff at Nortel Networks where he worked on embedded software for mobility management of 3G telecommunication systems. He is the author of *Timed Petri Nets: Theory and Application* (Kluwer 1998) and editor of *Handbook of Finite State Based Models and Applications* (CRC 2012). He is a senior member of IEEE.

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