Real-Time Embedded Components And Systems: With Linux and RTOS

By Sam Siewert, John Pratt

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This book is intended to provide a senior undergraduate or graduate student in electrical engineering or computer science with a balance of fundamental theory, review of industry practice, and hands-on experience to prepare for a career in the real-time embedded system industries. It is also intended to provide the practicing engineer with the necessary background to apply real-time theory to the design of embedded components and systems. Typical industries include aerospace, medical diagnostic and therapeutic systems, telecommunications, automotive, robotics, industrial process control, media systems, computer gaming, and electronic entertainment, as well as multimedia applications for general-purpose computing. This updated edition adds three new chapters focused on key technology advancements in embedded systems and with wider coverage of real-time architectures. The overall focus remains the RTOS (Real-Time Operating System), but use of Linux for soft real-time, hybrid FPGA (Field Programmable Gate Array) architectures and advancements in multi-core system-on-chip (SoC), as well as software strategies for asymmetric and symmetric multiprocessing (AMP and SMP) relevant to real-time embedded systems, have been added. Companion files are provided with numerous project videos, resources, applications, and figures from the book. Instructors' resources are available upon adoption.

Features
+Provides a comprehensive, up to date, and accessible presentation of embedded systems without sacrificing theoretical foundations
+Features the RTOS (Real-Time Operating System), but use of Linux for soft real-time, hybrid FPGA architectures and advancements in multi-core system-on-chip is included
+Discusses an overview of RTOS advancements, including AMP and SMP configurations, with a discussion of future directions for RTOS use in multi-core architectures, such as SoC
+Detailed applications coverage including robotics, computer vision, and continuous media
+Includes a disc (4GB) with videos, resources, projects, examples, and figures from the book[All files are available for downloading from the publisher with

Amazon Order Number by writing to info@merclearning.com]
+Provides instructors' resources, including lecture notes, Microsoft PP slides, etc.

Brief Table of Contents
Part I: Real-Time Embedded Theory. 1. Introduction. 2. System Resources. 3. Processing. 4. Resources. 5. Memory. 6. Multiresource Services. 7. Soft Real-Time Services. Part II: Designing Real-Time Embedded Components. 8. Embedded System Components. 9. Traditional Hard Real-Time Operating Systems. 10. Open Source Real-Time Operating Systems. 11. Integrating Embedded Linux into Real-Time Systems. 12. Debugging Components. 13. Performance Tuning. 14. High Availability and Reliability Design. Part III: Putting it All Together. 15. System Life Cycle. 16. Continuous Media Applications. 17. Robotic Applications. 18. Computer Vision Applications. Appendix A. Terminology Glossary. Appendix B. About the DVD. Appendix C. Wind River Systems University Program for Workbench/VxWorks. Appendix D. Real-Time and Embedded Linux Distributions and Resources. Bibliography. Index.

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+Documentation, project code, a Visio design example, articles related to real-time embedded systems, Linux, and more!

About the Authors
Sam Siewert is an assistant professor at Embry Riddle Aeronautical University and an assistant professor adjunct at University Colorado-Boulder. He is the author of Real-Time Embedded Components and Systems (Cengage Learning). John Pratt is an adjunct computer engineering instructor at the University of Colorado-Boulder and Senior Staff Engineer/Manager at Qualcomm Inc.

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Editorial Review

About the Author

Sam Siewert (Erie, CO) is a principal engineer and an adjunct professor at the University of Colorado at Boulder where he teaches Real-Time Embedded Systems in the department of Electrical and Computer Engineering. He has worked on hard real-time systems for more than 12 years as a contractor to NASA for deep space and astronautic systems and more than 5 years in the telecommunications and storage systems industry. Sam received his BS in Aerospace and Mechanical Engineering from the University of Notre Dame and his Ph.D. in Computer Science from the University of Colorado at Boulder.

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