



Embedded Media Processing (Embedded Technology)

By David J. Katz, Rick Gentile

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A key technology enabling fast-paced embedded media processing developments is the high-performance, low-power, small-footprint convergent processor, a specialized device that combines the real-time control of a traditional microcontroller with the signal processing power of a DSP. This practical guide is your one-stop shop for understanding how to implement this cutting-edge technology. You will learn how to:

- Choose the proper processor for an application.
- Architect your system to avoid problems at the outset.
- Manage your data flows and memory accesses so that they line up properly
- Make smart-trade-offs in portable applications between power considerations and computational performance.
- Divide processing tasks across multiple cores.
- Program frameworks that optimize performance without needlessly increasing programming model complexity.
- Implement benchmarking techniques that will help you adapt a framework to best fit a target application, and much more!

Covering the entire spectrum of EMP-related design issues, from easy-to-understand explanations of basic architecture and direct memory access (DMA), to in-depth discussions of code optimization and power management, this practical book will be an invaluable aid to every engineer working with EMP, from the beginner to the seasoned expert.

- Comprehensive subject coverage with emphasis on practical application
- Essential assembly language code included throughout text
- Many real-world examples using Analog's popular Blackfin Processor architecture

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Editorial Review

Review

"Both the experienced system designer and the student will find value in this comprehensive work. More practical than a theoretical text, it's what an expert engineer would tell a peer embarking on the journey of embedded media processing. Notably reader-friendly for a subject this complex, this book should give anyone access to multimedia design techniques including memory partitioning, data movement, and power considerations."

- Max Baron, Principal Analyst, In-Stat

"This readable, practical book addresses the needs of today's embedded systems that are designed specifically to meet the computational demands and power constraints of the latest embedded audio, video and communications applications. The book spans architectures, implementations, memory issues, data flows, and sharing of processing loads, while exploring the inevitable tradeoffs that engineers must weigh in their designs."

- Bill Schweber, Executive Editor, EDN Magazine

"Grounded in real-world application support experience, this book provides readers with an in-depth look at embedded multimedia design and the processors that are driving the emergence of a new class of applications – from video-enabled handheld devices to control-intensive industrial imaging systems."

- Sam Fuller, Vice President, R&D, Analog Devices, Inc.

"You cannot go wrong buying this book. The authors have done an excellent job blending practical information about embedded media processing with general information about signal processing. If you plan to develop embedded applications that will employ video or audio information, you will find this book more than earns its keep."

- Jon Titus, Senior Technical Editor, ECN

About the Author

Rick Gentile joined ADI in 2000 as a Senior DSP Applications Engineer, and he currently leads the Processor Applications Group, which is responsible for Blackfin, SHARC and TigerSHARC processors. Prior to joining ADI, Rick was a Member of the Technical Staff at MIT Lincoln Laboratory, where he designed several signal processors used in a wide range of radar sensors. He has authored dozens of articles and presented at multiple technical conferences. He received a B.S. in 1987 from the University of Massachusetts at Amherst and an M.S. in 1994 from Northeastern University, both in Electrical and Computer Engineering.

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