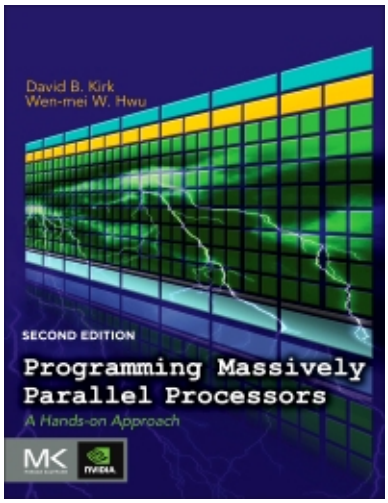

Programming Massively Parallel Processors

2nd Edition

A Hands-on Approach

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Authors: David Kirk, Wen-mei Hwu

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Description

Programming Massively Parallel Processors: A Hands-on Approach, Second Edition, teaches students how to program massively parallel processors. It offers a detailed discussion of various techniques for constructing parallel programs. Case studies are used to demonstrate the development process, which begins with computational thinking and ends with effective and efficient parallel programs.

This guide shows both student and professional alike the basic concepts of parallel programming and GPU architecture. Topics of performance, floating-point format, parallel patterns, and dynamic parallelism are covered in depth. This revised edition contains more parallel programming examples, commonly-used libraries such as Thrust, and explanations of the latest tools. It also provides new coverage of CUDA 5.0, improved performance, enhanced development tools, increased hardware support, and more; increased coverage of related technology, OpenCL and new material on algorithm patterns, GPU clusters, host programming, and data parallelism; and two new case studies (on MRI reconstruction and molecular visualization) that explore the latest applications of CUDA and GPUs for scientific research and high-performance computing. View more >

Key Features

- New coverage of CUDA 5.0, improved performance, enhanced development tools, increased hardware support, and more
- Increased coverage of related technology, OpenCL and new material on algorithm patterns, GPU clusters, host programming, and data parallelism
- Two new case studies (on MRI reconstruction and molecular visualization) explore the latest applications of CUDA and GPUs for scientific research and high-performance computing

Readership

Advanced students, software engineers, programmers, hardware engineers

Table of Contents

Details

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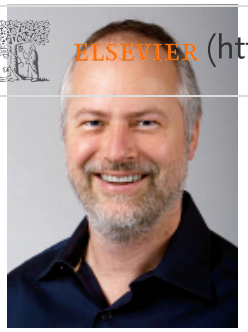
About the Author



David Kirk

David B. Kirk is well recognized for his contributions to graphics hardware and algorithm research. By the time he began his studies at Caltech, he had already earned B.S. and M.S. degrees in mechanical engineering from MIT and worked as an engineer for Raster Technologies and Hewlett-Packard's Apollo Systems Division, and after receiving his doctorate, he joined Crystal Dynamics, a video-game manufacturing company, as chief scientist and head of technology. In 1997, he took the position of Chief Scientist at NVIDIA, a leader in visual computing technologies, and he is currently an NVIDIA Fellow.

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Affiliations and Expertise

NVIDIA Fellow

Wen-mei Hwu

Wen-mei W. Hwu is a Professor and holds the Sanders-AMD Endowed Chair in the Department of Electrical and Computer Engineering, University of Illinois at Urbana-Champaign. His research interests are in the area of architecture, implementation, compilation, and algorithms for parallel computing. He is the chief scientist of Parallel Computing Institute and director of the IMPACT research group (www.impact.crhc.illinois.edu). He is a co-founder and CTO of MulticoreWare. For his contributions in research and teaching, he received the ACM SigArch Maurice Wilkes Award, the ACM Grace Murray Hopper Award, the Tau Beta Pi Daniel C. Drucker Eminent Faculty Award, the ISCA Influential Paper Award, the IEEE Computer Society B. R. Rau Award and the Distinguished Alumni Award in Computer Science of the University of California, Berkeley. He is a fellow of IEEE and ACM. He directs the UIUC CUDA Center of Excellence and serves as one of the principal investigators of the NSF Blue Waters Petascale computer project. Dr. Hwu received his Ph.D. degree in Computer Science from the University of California, Berkeley.

Affiliations and Expertise

CTO, MulticoreWare and professor specializing in compiler design, computer architecture, microarchitecture, and parallel processing, University of Illinois at Urbana-Champaign

Awards

Intel Recommended Reading List for Developers, 1st Half 2013 – Books for Software Developers, Intel

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Reviews

"For those interested in the GPU path to parallel enlightenment, this new book from David Kirk and Wen-mei Hwu is a godsend, as it introduces CUDA (tm), a C-like data parallel language, and Tesla(tm), the architecture of the current generation of NVIDIA GPUs. In addition to explaining the language and the architecture, they define the nature of data parallel problems that run well on the heterogeneous CPU-GPU hardware ... This book is a valuable addition to the recently reinvigorated parallel computing literature." **--David Patterson, Director of The Parallel Computing Research Laboratory and the Pardee Professor of Computer Science, U.C. Berkeley. Co-author of *Computer Architecture: A Quantitative Approach*** View more >

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