



OpenCL Programming by Example

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For a comprehensive, easy-to-swallow guide to OpenCL Programming, this book is out on its own. That's because it teaches through examples and covers everything from parallel sorting to optimization in simple stages.

Overview

- Learn about all of the OpenCL Architecture and major APIs.
- Learn OpenCL programming with simple examples from Image Processing, Pattern Recognition and Statistics with detailed code explanation.
- Explore several aspects of optimization techniques, with code examples to guide you through the process
- Understand how to use OpenCL in your problem domains

In Detail

Research in parallel programming has been a mainstream topic for a decade, and will continue to be so for many decades to come. Many parallel programming standards and frameworks exist, but only take into account one type of hardware architecture. Today computing platforms come with many heterogeneous devices. OpenCL provides royalty free standard to program heterogeneous hardware.

This guide offers you a compact coverage of all the major topics of OpenCL programming. It explains optimization techniques and strategies in-depth, using illustrative examples and also provides case studies from diverse fields. Beginners and advanced application developers will find this book very useful.

Beginning with the discussion of the OpenCL models, this book explores their architectural view, programming interfaces and primitives. It slowly demystifies the process of identifying the data and task parallelism in diverse algorithms.

It presents examples from different domains to show how the problems within different domains can be solved more efficiently using OpenCL. You will learn about parallel sorting, histogram generation, JPEG compression, linear and parabolic regression and k-nearest neighborhood, a clustering algorithm in pattern recognition. Following on from this, optimization strategies are explained with matrix multiplication examples. You will also learn how to do an interoperation of OpenGL and OpenCL.

"OpenCL Programming by Example" explains OpenCL in the simplest possible language, which beginners will find it easy to understand. Developers and programmers from different domains who want to achieve acceleration for their applications will find this book very useful.

What you will learn from this book

- Understand OpenCL Platform Model, Execution Model, Memory Model, and Programming Model
- Explore the different OpenCL objects, APIs for building kernel, memory allocation, data transfer, synchronization, and many more
- Get to grips with API explanations, featuring simple examples
- Create image processing examples such as Image histogram and Image convolution

- Learn optimization techniques with Matrix Multiplication examples
- Develop Bitonic sort in OpenCL
- Build JPEG decoder using OpenCL
- Construct linear and parabolic regression equation in OpenCL
- Compose k-nearest neighborhood clustering algorithm from pattern recognition
- Use OpenCL with OpenGL interoperability

Approach

This book follows an example-driven, simplified, and practical approach to using OpenCL for general purpose GPU programming.

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