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Cache Hierarchies and Memory Systems; The architectural design space; CPU Designs; Low-Power CPUs; Mainstream Desktop CPUs; Intel Itanium 2; Niagara; GPU Architectures; Handheld GPUs; At the High End: AMD Radeon HD7970 and NVIDIA GTX580; APU and APU-Like Designs; Summary; References; Chapter 4: Basic OpenCL Examples; Introduction; Example Applications; Simple Matrix Multiplication Example Step 1: Set Up Environment Step 2: Declare Buffers and Move Data; Step 3: Run time Kernel Compilation; Step 4: Run the Program; Step 5: Return Results to Host; Image Rotation Example; Step 1: Set Up Environment; Step 2: Declare Buffers and Move Data; Step 3: Run time Kernel Compilation; Step 4: Run the Program; Step 5: Read Result Back to Host; Image Convolution Example; Step 1: Create Image and Buffer Objects; Step 2: Write the Input Data; Step 3: Create Sampler Object; Step 4: Compile and Execute the Kernel; Step 5: Read the Result; The Convolution Kernel; Compiling OpenCL Host Applications Summary Chapter 5: Understanding OpenCL's Concurrency and Execution Model; Introduction; Kernels, Work-Items, Workgroups, and the Execution Domain; OpenCL Synchronization: Kernels, Fences, and Barriers; Queuing and Global Synchronization; Memory Consistency in OpenCL; Events; Command Queues to Multiple Devices; Event Uses beyond Synchronization; User Events; Event Callbacks; Native Kernels; Command Barriers and Markers; The Host-Side Memory Model; Buffers; Manipulating Buffer Objects; Images; The Device-Side Memory Model; Device-Side Relaxed Consistency; Global Memory; Local Memory Constant Memory

Sommario/riassunto

Heterogeneous Computing with OpenCL teaches OpenCL and parallel programming for complex systems that may include a variety of device architectures: multi-core CPUs, GPUs, and fully-integrated Accelerated Processing Units (APUs) such as AMD Fusion technology. Designed to work on multiple platforms and with wide industry support, OpenCL will help you more effectively program for a heterogeneous future. Written by leaders in the parallel computing and OpenCL communities, this book will give you hands-on OpenCL experience to address a range of fundamental parallel algorithms. The
