"APPLIED PARALLEL COMPUTING"
Education and Research Center

NVIDIA Advanced CUDA Programming Course

Description

The Institute of Aerodynamics and Fluid Mechanics at TU München announces in cooperation with NVIDIA (www.nvidia.com), FluiDyna GmbH (www.fluidyna.com) and the Applied Parallel Computing E&R Center (www.parallel-compute.com) a closed CUDA training for advanced software developers. The training is free of charge and dedicated to researchers with basic experiences in programming own CUDA codes. Main focuses will be the development of multi-GPU applications and the addressing of performance issues by debugging and optimizations techniques.

Organization

Training identifier:	TUM-AER-WB-2012-01
Requirements:	basic programming skills in CUDA
Participants:	max. 25
Date:	January, 16-18, 2012 (3 days)
Hours:	09:00am – 05.00pm
Place:	Technische Universität München Leibniz-Rechenzentrum der Bayerischen Akademie der Wissenschaften, Boltzmannstraße 1, 85748 Garching bei München, Germany, Room H.U.010
Costs:	none
Trainer:	Dmitry Mikushin
Registration:	via eMail to: Thomas.Indinger@tum.de

Course Plan

1. From GPU to GPGPU
    - 1.1 Performance and parallelism
    - 1.2 GPU evolution
    - 1.3 Parallel systems: multicore and clustering

7. Using multiple GPUs
    - 7.1 CUDA context
    - 7.2 fork
    - 7.3 MPI
    - 7.4 POSIX-threads
    - 7.5 OpenMP
    - 7.6 Boost.Threads
8. CUDA Streams
    - 8.1 Example: concurrent kernels execution
    - 8.2 Example: matrix multiplication
    - 8.3 Example: Multi-GPU Async Copy
9. Debugging
    - 9.1 Principles and terminology
    - 9.2 gdb
    - 9.3 cuda-gdb
    - 9.4 CUDA (Visual) Profiler
    - 9.5 cuda-memcheck
10. Optimization Techniques

Hands-on Session: basic CUDA programming, shared memory utilization, profiling, CUDA Libraries, Thrust, MultiGPU, CUDA Streams, debugging.