OpenMP and GPU Programming

GPU Exercises

Emanuele Ruffaldi

https://github.com/eruffaldi/course_openmpgpu

PERCeptual RObotics Laboratory, TeCIP
Scuola Superiore Sant'Anna
Pisa,Italy

e.ruffaldi@sssup.it

April 13,2016

CUDA Exercises

We are going to perform simple exercises using the CUDA tools to start understanding its capabilities.
Access samples and the exercises at:
`https://github.com/eruffaldi/course_openmpgpu`

- Build and use deviceQuery
- Vector addition, dot product
- Discussion about Matrix Multiplication
- Mandelbrot case in GPU

deviceQuery

Compile and run deviceQuery on different machine, understand the differences in capabilities.

Vector Addition

Start from the basic main addition and make it vectorial for 20000 elements, then transform into dot product. Finally start discussing about matrix multiplication.

- Always verify the results
- Test speedup (at which size GPU is faster than CPU)
- Use CUDA events for timing GPU execution

Mandelbrot case in GPU

Transform the Mandelbrot program (solved) of last OpenMP lecture in a CUDA program:

- Test point-wise the solutions
- Test speed-up
- Which is the problem for paralellism in the naive implementation of Mandelbrot with CUDA?