UNIVERSITÀ DI PISA

Computer Science Department

Thesis for Master Degree in Computer Science

GP-GPU: From Data Parallelism to Stream Parallelism

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Contents

CHAPTER 1

Introduction

This is the first section.

1.1 Goals

The main goal of this thesis is to study GPU's behavior when used for different purposes with respect to the common ones. In particular, we wanted to use a GPU to perform a code that comes closer to a ***stream parallel pattern***. Then we observed ongoings, in terms of *completion time* and *speed up* . We now see in detail the concepts we've just introduced.

1.1.1 GPU Architecture and Data Parallel

GPU (Graphics Processing Unit) is a coprocessor, generally known as a highly parallel multiprocessor optimized for visual computing. [1]

1.1.2 Other Applications: Stream Parallel

1.1.3 GP-GPUs and Stream Parallel

1.2 Expectations

1.3 Results

1.4 Tools

CHAPTER 2

Tools

Here the description of tools

2.1 CUDA

CUDA,

2.2 Profilers

CUDA Profilers for GPU

2.2.1 nvprof

nvprof,

2.2.2 nSight

nSight,

2.3 C++

C++,

2.3.1 Visual Studio

Visual Studio,

2.4 Python

CHAPTER 3

Project Logic

Logic scheme and description.

3.1 Graph on Logic

Put a really beautiful graph here

CHAPTER 4

Implementation

Specs and code.

4.1 High Parallel on GPU

¡¡¡56*K, blockSize¿¿¿

4.2 Low Parallel un GPU

¡¡¡1, blockSize¿¿¿

4.3 Data Parallel un GPU

¡¡¡dataSize/blockSize, blockSize¿¿¿

4.4 CPU and GPU Mix

Queue with P and Q chunk exec by respectively CPU and GPU.

CHAPTER 5

Experiments

Experiments bla bla

5.1 What and How

Some explanation

5.2 Results

Results

5.3 Some Plots

CHAPTER 6

Conclusions

Some Concl.

Bibliography

[1] D.A. Patterson, J.L. Hennessy, *Computer Organization and Design: The Hardware and Software Interface*, V Edition. Appendix C by J. Nickolls, D.Kirk.