GPU optimization of base form 820 - collective artificial spouse retirement plan

Nikolaj Aaes, Niklas Schalck Johansson and Hildur Uffe Flemberg

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1 Abstract

Abstract

2 Introduction

- Why is the project relevant, what is the problem at hand
Scope? [1]
Hvad regner vi med at lseren har af kompetencer

3 Background

- Related work, projects that precedes this project, why do we use the technology described, what is this new technology

4 The Math

- Description of the insurance math used in the current solution

The algorithm in this project is used to determine the lump sum of money the insurance company needs to possess to be able to pay the insurance holder's spouse in the case of his or her death. The payment to the spouse will be in

the form of a life interest which are disbursed from the time of death of the insurance holder unless the death occurs before the pension age. In that case the money will be disbursed after a grace period determined by the insurance company at the time the insurance was taken out.

We assume that the spouse of the insurance holder is of the opposite gender. If the insurance holder does not have a spouse at the time of his or her death the insurance is forfeited.

The algorithm used here is a 4th order Runge-Kutta solution (indst reference) where we use a series of constants determined before any calculation begins:

Constants

Name	**Meaning**
τ	The time of death of the insurance holder
r	The pension age
g	The grace period
x	The age of the insurance holder at calculation time ($t = 0$)
t	The time of calculation
h	The Stepsize of the Runge-Kutta solution

Apart from this there is also a constant k which are determined by τ, r and g in the following manner:

How k is defined

If this statement holds	**then k equals**
$\tau < r$	g
$r \leq \tau < r + g$	$r + g - \tau$
$r + g \leq \tau$	0

5 CUDA

- A more elaborate description of GPGPUs, architecture and CUDA C.

6 Implementation

- A description of the new implementation and design choices

7 Testing

- A test to ensure that the new implementation produces the same output as the current implementation

8 Benchmarks and Comparison

- Benchmarking and comparison on speed between the current and new implementation

9 Conclusion

Conclusion

10 Reflection / Discussion / Future improvements

- Did we achieve what we wanted? what did we discover during the project? What can be changed in future implementations?

11 Glossary

- Forsikringstager - insurance holder
- gteflle - Spouse
- livrente - life interest
- ddfaldssum
- pause periode - grace period

References

[1] David B. Kirk, Wen-mei W. Hwu - Programming Massively Parallel Proccesors, A Hands-on Approach - Elsevier Inc. - 2010