Delaunay Triangulations on the GPU

Patryk Drozd
Trinity College Dublin
drozdp@tcd.ie

Abstract

An exploration of the synthesis and implementation of Delaunay triangulation algorithms for their use in hetrogenous computing.

Contents

1. Motivation

2. Preliminary

3. Serial Algorithms

3.1. Lawsons algorithm

Theorem 3.1.1: Given any two triangulations of a set of points S, T' and T'', there exist a finite sequence of exchanges by which T' can be transformed to T''.

3.1.1. implementation

3.2. Incremental Point Insertion

3.2.1. implementation

4. The CUDA programming model

5. Parallel Algorithms

5.1. GPU-DT

5.2. gDel3d

5.2.1. implementation

Algorithm 1: My cool algorithm

```
1  do something
2  do something else
3  while still something to do
4  |  do even more
5  |  if not done yet then
6  |  |  wait a bit
7  |  |  resume working
8  |  else
9  |  |  go home
10 |  end
11 end
```

text in here and funny thing to [1] text in here and funny thing to [2]

Bibliography

[1] W. H. Press, S. A. Teukolsky, W. T. Vetterling, and B. P. Flannery, *Numerical Recipes 3rd Edition: The Art of Scientific Computing*, 3rd ed. USA: Cambridge University Press, 2007.

[2] S. L. Devadoss and J. O'Rourke, *Discrete and Computational Geometry, 1st Edition*. Princeton University Press, 2011.