

Delaunay Triangulations on the GPU

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Abstract

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

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1. Motivation

2. Preliminary

3. Serial Algorithms

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5.1. GPU-DT

5.2. gDel3d

5.2.1. implementation

```
1: procedure BINARY-SEARCH( $A, n, v$ )
2:    $l \leftarrow 1$ 
3:    $r \leftarrow n$ 
4:
5:   while  $l \leq r$  do
6:      $mid \leftarrow \text{floor}(\frac{l+r}{2})$ 
7:     if  $A[mid] < v$  then
8:        $l \leftarrow m + 1$ 
9:     else if  $A[mid] > v$  then
10:       $r \leftarrow m - 1$ 
11:    else
12:      return  $m$ 
13:    end
14:  end
15:  return null
16: end
```

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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.