Analyzation of Minimum Spanning Tree Algorithms Using

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Abstract

Graph Theory is a common study of graphs in computer sciences and mathematics fields.
One of its well-known problems is finding the Minimum Spanning Tree(MST). A minimum spanning tree is a spanning tree of a connected, undirected graph which connects all the vertices together with a minimal total weight for its edges. In 1926, Czech mathematician Otakar Borůvka found the first algorithm finding MST. As a matter of fact, there has been many algorithms invented since then. In this project, we will evaluate three existing algorithms by the following steps: first, modify the original code of three algorithms to make them more synchronous; second, run all of them on the same computer architecture; lastly, compare their performance based on access pattern, cache misses and execution time etc. The three algorithms we will use are Prim's Algorithm, Kruskal's Algorithm and Borůvka's algorithm.

Keywords MST, Kruskal, Prim, Boruvka

I. Introduction

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II. Related Work

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III. The Algorithm

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A. Boruvka's Algorithm

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B. Prim's Algorithm

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C. Kruskal's Algorithm

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IV. Experimental Results

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V. Alternative Parallelization Approach

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Reference