University of Victoria | Graduate Studies

Notice of the Final Oral Examination
for the Degree of Master of Science

of

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"Triangle Counting and Listing in Directed and Undirected Graphs Using Single Machines"

Department of Computer Science

Tuesday, July 24, 2018
11:00 A.M.
Engineering and Computer Science Building
Room 468

Supervisory Committee:
Dr. Alex Thomo, Department of Computer Science, University of Victoria (Co-Supervisor)
Dr. Venkatesh Srinivasan, Department of Computer Science, UVic (Co-Supervisor)

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Dr. Aaron Gulliver, Department of Electrical and Computer Engineering, UVic

Chair of Oral Examination:
Dr. Joseph Parsons, Department of Psychology, UVic

Dr. David Capson, Dean, Faculty of Graduate Studies

Abstract

Triangle is an important element in graph analysis, and because of this triangle enumeration is a topic that has been studied extensively. Although the formulation is simple, for large networks the computation becomes challenging as we have to deal with memory limitation and efficiency. Many algorithms had been proposed to overcome these problems. Some use distributed computing, where the computation is distributed among many machines in a cluster. However, this approach requires high cost - in terms of hardware resources and energy. In this thesis we searched for efficient triangle counting/listing algorithms that can be used on a single machine, for both directed and undirected graphs. We built programs that implement the algorithms, and we tested them on large networks with up to almost a billion nodes. The results were analysed, and the insights that were gained were discussed.