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

of

SHU CHEN

B.Eng. (Hangzhou Dianzi University, 2014)

"Influential Community Discovery in Massive Social Networks Using a Consumer-Grade Machine"

Department of Computer Science

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1:00 P.M.
Engineering and Computer Science Building
Room 468

Supervisory Committee:
Dr. Alex Thomo, Department of Computer Science, University of Victoria (Supervisor)
Dr. Kui Wu, Department of Computer Science, UVic (Member)

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Dr. Jamie Lawson, Department of Political Science, UVic

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Abstract

Graphs have become very crucial as they can represent a wide variety of systems in different areas. One interesting structure called community in graphs has attracted considerable attention from both academia and industry. Community detection is meaningful, but typically hard in arbitrary networks. A lot of research has been done based on structural information, but we would like to find communities which are not only cohesive but also influential or important. A k-influential community model based on k-core provided by Li, Qin, Yu, and Mao is helpful to discover these cohesive and important communities. They organize the problem as finding top-r most important communities in a given graph.

In this thesis, our goal is to detect top-r most important communities using efficient and memory-saving algorithms running on a consumer-grade machine. We analyze two existing algorithms, then propose multiple new efficient algorithms for this problem. To test their performance, we conduct extensive experiments on some real-world graph datasets. Experimental results show that our algorithms are able to compute top-r most important communities within a very reasonable amount of time and space in a consumer-grade machine.