CMPT 479 - D100 Special Topics in Computing Systems: Large-Scale Graph Processing

Instructors: Keval Vora

SFU Burnaby

Calendar Objective/Description:
Current topics in computing systems depending on faculty and student interest.

Instructor's Objectives:
The wide applicability of modeling and analyzing graph data, coupled with rapid growth in the amount of graph data to be analyzed has led to the development of various large-scale graph processing systems over past few years. Developing these systems requires careful design of fundamental components like graph data structures, concurrent execution models and programming models to maximize parallelism, improve resource utilization and support user-guided graph analytics. This course explores the emerging research in development of scalable graph processing systems. We will explore how challenges in processing large graphs are being solved in real-world systems as well as the limitations inherent in their designs. This is a seminar and project based course, meaning that students are expected to give presentations on research papers and also work towards a term project. Students will require background in parallel computing, operating systems and databases.

Prerequisites:
CMPT 300, CMPT 354

Topics:
- Graph processing problems and their challenges
- Execution and programming models
- Processing static and dynamic graphs
- Fault tolerance in graph processing
- Graph processing across different execution environments - distributed, shared memory, GPUs

Grading:
Grading will be based on presentations, class participation and the term project. There will be no midterm or final exam. Details about grading will be discussed in the first week of class.

Academic Honesty Statement:
Academic honesty plays a key role in our efforts to maintain a high standard of academic excellence and integrity. Students are advised that ALL acts of intellectual dishonesty will be handled in accordance with the SFU Academic Honesty and Student Conduct Policies (http://www.sfu.ca/policies/gazette/student.html).