CMPT 886 - G200 Special Topics in Operating Systems

Instructor(s): Keval Vora

Instructor's Objectives:
Modern data analytics solutions (machine learning, data mining, etc.) often involve graph-based computations to infer useful results. Such growing need of analyzing graph data, coupled with rapid increase in the amount of graph data to be analyzed has led to the development of various large-scale graph analytics systems over past few years. Developing these systems requires careful design of fundamental components like graph data structures and concurrent execution/programming models that 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 based course, meaning that students are expected to give presentations on research papers and also work towards a term project. Background in software systems, databases and parallel computing is preferable.

Prerequisites:
None

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).