CMPT 981 - G100 Spec. Top. Theoretical Cmpt

Instructor(s): Andrei Bulatov

Calendar Objective/Description:
Spec. Top. Theoretical Cmpt

Instructor's Objectives:
The Constraint Satisfaction Problem (CSP) in its various incarnations is ubiquitous throughout theoretical computer science, artificial intelligence, and discrete mathematics. The propositional satisfiability and unique games in complexity theory, conjunctive queries in databases, primitive-positive sentences in logic, homomorphisms of graphs or relational structures in graph theory and finite model theory are forms and cases of the CSP. It serves as a benchmark for multiple algorithmic and complexity theoretic approaches. Over the last several decades several approaches to the problem have been developed and multiple variations of the CSP have been proposed. The purpose of this course is to introduce the basics of the CSP and the main approaches to the problem. The course is based on multiple papers and surveys.

Prerequisites:
see go.sfu.ca

Topics:
- The multiple definitions of the CSP
- Structural restrictions: logic games and bounded (tree) width
- Fixed template: universal algebra
- Algorithmic techniques: bounded width and few subpowers
- The CSP complexity dichotomy
- Counting and optimization
- Promise CSP

Grading:
Will be discussed in the beginning of the course

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).