CMPT 777 - G100 Formal Verification

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Calendar Objective/Description:
The goal of formal verification is to prove correctness or to find mistakes in software and other systems. This course introduces, at an accessible level, a formal framework for symbolic model checking, one of the most important verification methods. The techniques are illustrated with examples of verification of reactive systems and communication protocols. Students learn to work with a model checking tool such as NuSMV.

Instructor’s Objectives:
(Please note that this course is cross-listed with CMPT 477) Real software systems are extremely complex. In the software industry, formal verification methods are increasingly used to verify that a model of a software system satisfies the requirements. The course concentrates on contemporary applications of logic to the verification of software systems. The objective is to introduce, at an accessible level, a mathematical framework for symbolic model checking, one of the most important verification methods. The techniques are illustrated with examples of verification of reactive systems and communication protocols. Students learn to work with the model checking tool SMV.

Prerequisites:
None

Topics:
- Model checking as a verification technique
- Model checking with Computational Tree Logic (CTL)
- Representing practically relevant specifications in CTL
- The NuSMV (`symbolic model verifier') system
- Alternatives and extensions of CTL
- Model checking with fairness

Grading:
Will be announced at the first week of classes.

Required Books:

Reference Books:

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).