CMPT 981 - G100 Spec. Top. Theoretical Cmpt

Instructor(s): Matthew Amy

Calendar Objective/Description:
Spec. Top. Theoretical Cmpt

Instructor’s Objectives:
Quantum computers in the gate model operate by executing quantum circuits. This course aims to broadly explore the techniques, foundational to modern, through which a high-level quantum algorithm may be compiled down to a circuit which can then be run on quantum hardware. It will cover the basics of gate model quantum computation then delve into different aspects of the quantum compilation stack, including the design and synthesis of quantum circuits, optimization of circuits, theoretical questions of efficiency, and the simulation and verification of quantum circuits.

Prerequisites:
see go.sfu.ca

Topics:
- Gate-model quantum computation
- Circuit synthesis
- Circuit optimization
- Circuit routing
- Quantum compilers
- Intermediate representations
- Verification

Grading:
Students will be evaluated through a mixture of homework assignments, paper presentations, and a final project. More details to be discussed in the first week of class.

Reference Books:
Quantum Computation and Quantum Information, Michael A. Nielsen, Isaac L. Chuang, 2000, 9781107002173

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).