CMPT 499 - D100 Special Topics in Computer Hardware

**Instructor(s):** Arrvindh Shriraman

**SFU Burnaby**

**Calendar Objective/Description:**
Current topics in computer hardware depending on faculty and student interest.

**Instructor's Objectives:**
This course will explore, from a computer architecture perspective, the principles of hardware/software codesign for machine learning. One thrust of the course will delve into accelerator, CPU, and GPU enhancements for ML algorithms, including parallelization techniques. The other thrust of the course will focus on how machine learning can be used to optimize conventional architectures by dynamically learning and adapting to program behavior.

Is this a machine learning course?
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Not really – the computation behind machine learning and how that is exploited with hardware is what is most relevant here.

**Prerequisites**
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It is recommended that you have taken some courses in computer organization. Expected background includes basic knowledge of simple hardware pipelines (ie. how does an inorder processor work?).

Strong programming background : C++/C

All of that said, we will spend time going in depth on background/review during the first two-or-so weeks to build a foundation for more advanced architecture concepts.

**Projects and Assignments**
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We will be working with FPGAs, designing hardware targeting specific algorithms.

**Prerequisites:**
CMPT/ENSC 250.

**Topics:**
- Machine Learning
- Hardware architecture
- Hardware/Software Co-design

**Grading:**
Project - 50% , Assignments - 50%

**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).