**Special Topics in Computing Science**

**CMPT 880 G100**

**Learning Deep Neural Nets**

**Simon Fraser University**

**Spring 2019**

**Instructor: Oliver Schulte**

For course details such as scheduling, contact information, office hours etc., please see the course website at courses.cs.sfu.ca

**Overview**

Machine learning has become the main framework for building programs that perform intelligent tasks. In fields such as computer vision and natural language processing, many recent successes have been achieved using neural nets with several layers, so-called deep neural nets. This course is an introduction to deep neural nets, techniques for training them from data, and significant applications.

**Objectives**

* Learn the main theoretical ideas behind deep learning.
* Ability to read research papers in this area.
* Become familiar with a set of computational tools for deep learning.
* Evaluate one or deep learning tools on a realistic task (course project).

The initial lectures will provide introduction to the necessary background. *The course is a seminar course, meaning that students are expected to give presentations.*

**Prerequisites**

Having passed CMPT 726 or equivalent. Consult with me on what is “equivalent”. There will be a background quiz to give you feedback on whether you are prepared.

**Grading and Expectations**

About a third of the course is devoted to student presentations and course discussions. The course is meant to be practical, in the sense that the students should learn to use and apply programs that carry out deep learning. Deep learning is still a young part of machine learning, and we want to evaluate its potential by applying deep learning techniques to real problems. Because of the class size, presentations must be done in groups, with at least 3 members each. All group members receive the same grade.

**Presentations**

* A topic presentation introduces advanced or additional topics beyond what we cover in the main lectures.
* The project presentation should outline an idea for a project. The purpose is to give you feedback early.
* The final presentation of the project will show what you created and results.

**Projects**

Every student should carry out a course project in a group. I will suggest course projects, but you are free to design your own. A typical course project applies deep learning to a dataset that is of interest to the student, for example one from their thesis research.

**Grading**

* In-class Background Quiz: 5%.
* Exercise: 5%
* Homeworks: 15%.
* Topic Presentation: 15%.
* Project Outline Presentation: 15%
* Final Project, Project Presentation: 45%.