CMPT 459 - D100 Special Topics Database Systs

Instructor(s):	Martin Ester	
		SFU Burnaby

Calendar Objective/Description:

Special Topics Database Systs

Instructor's Objectives:

This course introduces Data Mining, an area that plays a key role in Big Data analytics. The goal of data mining is the efficient discovery of useful patterns in large datasets. This course focuses on fundamental data mining tasks and algorithms as well as key applications. It will prepare you both for developing your own data mining application and for starting your data mining research.

Students taking this course are expected to have taken an algorithms course and to have an understanding of basic statistics equivalent to an entry-level course. The course project requires programming in Python or R, and students are expected to be proficient with one of these programming languages.

Prerequisites:

see go.sfu.ca

Topics:

- Introduction

- Data preprocessing: data cleaning, completion, transformation, normalization

- Classification: evaluation, decision trees, Bayesian classification, NN, SVM, ensemble methods

- Cluster analysis: partitioning, hierarchical, density-based methods, subspace clustering

- Outlier detection: probabilistic and distance-based methods, LOF, non-parametric methods

- Frequent pattern mining: association rules, Apriori, FP-growth, pattern summarization

- Applications: social network analysis, recommender systems, precision medicine

- Research issues: active learning, causal discovery, explainability, transfer learning

Grading:

Evaluation will be based on paper and pencil assignments, a course project, and a final exam. If the teaching will be online in the fall, the exam will be a take-home exam. Details to be discussed and finalized in the first week of classes.

Students must attain an overall passing grade on the weighted average of exams in the course in order to obtain a clear pass (C- or better).

Required Books:

Data Mining: The Textbook., Charu Aggarwal, Springer, 2015, 9783319141411, The book is available as e-book through the SFU Library.

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).