Computing Science Course Outlines

CMPT 825 - G100 Natural Language Processing

Instructor(s): Anoop Sarkar

Calendar Objective/Description:
In this course, theoretical and applied issues related to the development of natural language processing systems and specific applications are examined. Investigations into parsing issues, different computational linguistic formalisms, natural language syntax, semantics, and discourse related phenomena will be considered and an actual natural language processor will be developed.

Instructor's Objectives:
Imagine a world where you can pick up a phone and talk in English, while at the other end of the line your words are spoken in Chinese. Imagine a computer animated representation of yourself speaking fluently what you have written in an email. Imagine automatically uncovering protein/drug interactions in petabytes of medical abstracts. Imagine feeding a computer an ancient script that no living person can read, then listening as the computer reads aloud in this dead language. Natural Language Processing is the automatic analysis of human languages such as English, Korean, and thousands of others analyzed by computer algorithms that can make these applications possible. Unlike artificially created programming languages where the structure and meaning of programs is easy to encode, human languages provide an interesting challenge, both in terms of its analysis and the learning of language from observations.

Prerequisites:
None

Topics:
- Language models
- Edit distance
- Supervised machine learning for NLP
- Sequence labeling
- Unsupervised machine learning for NLP
- Machine translation
- Parsing and semantics

Grading:
Final Project: 30%. 1 Midterm: 18%. 5 Homeworks: 52%.

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).

Recommended Books:

Natural Language Processing with Python, Steven Bird, Ewan Klein, and Edward Loper, O'Reilly Media, 2009, 9780596516499, see: http://www.nltk.org/book - Can be downloaded

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).