Course Information

CS 6355: Structured Prediction

Building up structured output prediction

- Refresher of binary classification and introduction to multiclass classification
- Simple structures
  - Multiclass classification is really a trivial kind of a structure
- Sequence labeling problems
  - HMM, inference, Conditional Random Fields, Structured variants of SVM and Perceptron
- Conditional models: How previous algorithms extend to general structures

- Complexity of inference and inference algorithms
- Different training regimes
  - Training with/without inference
  - Constraint driven learning, posterior regularization

- Deep learning and structures
  - Do we need inference at all?
- Learning without full supervision
  - Latent variables, semi-supervised learning, indirect supervision

Class focus

- To see different examples of structures
  - Sequence labeling, eg. Part-of-speech tagging
  - Predicting trees, eg Parsing
  - More complex structures, eg: relation extraction, object recognition,
  - And most importantly,

    Your favorite domain/problem...

- To understand underlying *concepts*
  - Defining models, training, inference
  - Using domain knowledge to
    - Define features
    - Define models
    - Make better predictions

Course objectives

1. To be able to define structured models for new applications

2. To identify or design training and inference algorithms for a new problem

3. To be able to critically read current literature in structured prediction and its applications

Course mechanics

Course website: https://svivek.com/teaching/structured-prediction

- Course structure
  - Lectures
  - Readings and paper reviews

- No text book
  - Some useful background reading on course website

- Machine learning is a pre-requisite

- Assignments *(due dates on schedule page of website)*
  1. Three paper reviews (not hand written, please!)
  2. One or two assignments
  3. One class project in groups of size at most two
  4. No midterm/final. Instead, project proposal, intermediate checkpoints, final report <u>and</u> poster session.

Questions?

What assistance is available for you?

Course website: https://svivek.com/teaching/structured-prediction

We will use

Canvas for:

1. Announcements and communication
2. Discussion board
3. All submissions

Course website for:

1. Lecture slides
2. Notes and readings

Staff

Email: `svivek at cs.utah.edu`

Office hours:

Thu 11:00 AM, 3126 MEB,

or by appointment

TA: Yuan Zhuang

Email: `yuan.zhuang at utah.edu`

Please prefix subjects of all emails with course number

Policies (see website for details)

- **Collaboration vs. Cheating**
  - Collaboration is strongly encouraged, cheating will not be tolerated
  - The School of Computing policy on academic misconduct
    - If you haven't already done this, read and sign the SoC policy acknowledgement form within two weeks
  - Acknowledge sources and discussions in all deliverables

- **Late policy**
  - 10 % penalty if submitted one day late, no further extensions

- **Access and assistance**
  - If you need any assistance, please contact me as soon as possible

Questions?

Course expectations

This is an advanced topics course aimed at helping you navigate recent research.

I expect you to

- Participate in the class

- Complete the readings for the lectures

- And most importantly, demonstrate independence and mathematical rigor in your work

- No readings for next lecture

- For questions about registration, please meet me now