Computational Linguistics II (LING 28620/38620, CMSC 25620/35620)

Winter 2020

Course Information
Computational Linguistics II (LING 28620/38620, CMSC 25620/35620)
Times: Monday and Wednesday 1:30pm–2:50pm
Location: Cobb Hall 119

Contact Information
Instructor: Allyson Ettinger
Office: Rosenwald 229B
Email: aettinger@uchicago.edu
Office hours: Tues 2:00-3:00pm, or by appointment

Other information
Course website: `https://canvas.uchicago.edu/courses/25738`
Prerequisite: Computational Linguistics I (LING 28610/38610, CMSC 25610/35610)
Text: There is no textbook for this class. All readings will be provided on Canvas.

Course description: This is the second in a two-course sequence providing an introduction to topics at the intersection of computation and language, oriented toward linguists and cognitive scientists. This quarter we will cover additional topics in cognitive/linguistic modeling and natural language processing (NLP). Our goal in this quarter is for students to leave the course able to implement advanced models and conduct novel research in cognitive/linguistic modeling and NLP.

Expectations and grading procedures:

1. **Participation.** This course will combine lecture-style instruction with full-class discussion, so you will be expected to do readings and participate regularly in class discussions.

2. **Reading discussion posts.** You will be required to post on Canvas a minimum of 10 discussion posts commenting on readings for class, in advance of the class session in which the readings are discussed. The posts can be brief (2-3 sentences), and can contain comments, questions, speculation, or other discussion. The 10-post minimum must be met by posts for 10 separate class sessions.

3. **Problem sets.** There will be problem sets aimed at implementing ideas discussed in class, with the goal of helping students to reach a level of technical comfort that enables execution of competitive research in computational linguistics. These assignments will use Python.

4. **Final project.** You will complete a project implementing a computational model to address a scientific or engineering problem, or executing a substantive analysis of an existing computational model. Required components of this project are as follows:

   Final project components

   Proposal. Due Feb 5. By this time you need to have met with me to discuss your choice of project and obtain approval.

   Presentation. In class March 11. You will give a short presentation of your project in class. You should bring a handout and/or use slides. Further guidelines will be announced.

   Paper. Due Wednesday March 18. Submit online. Further guidelines will be announced.

Grading will be weighted as follows:

In-class participation: 10%
Reading posts: 10%
Problem sets: 35%
Final project: 45% (Presentation 5%, Paper 40%)

Course schedule

(subject to change—check Canvas for the most updated syllabus and assignments):

Date	**Topic**	**Reading**	**Assignment due**
Intro			
Monday 1/6	Course introduction and discussion		
Computational cognitive models and the past tense debate			
Wednesday 1/8	Rule-based modeling: ACT-R model	Anderson et al. (2004)	
Monday 1/13	ACT-R on morphology	Taatgen & Anderson (2002)	
Wednesday 1/15	Connectionism intro	Elman et al. (1996)	
Monday 1/20	*Martin Luther King, Jr. Day (No class)*		
Wednesday 1/22	Connectionism and morphology	Rumelhart & McClelland (1986)	
Monday 1/27	Update on the debate	Kirov & Cotterell (2018)	
Composition and sentence-level modeling			
Wednesday 1/29	Designing lexical representations for composition	Pustejovsky (1991)	Problem Set 1 due
Monday 2/3	Learning word representations for composition	Fyshe et al. (2015)	
Wednesday 2/5	Learning composition with syntax	Socher et al. (2013)	
Monday 2/10	Learning composition by neural models with select objectives	Hill et al. (2016)	Deadline to have met to propose final project topic

Wednesday 2/12	Modeling the N400 with the sentence gestalt model	Rabovsky et al. (2018)	
Discourse-level modeling			
Monday 2/17	Rational Speech Acts model	Frank & Goodman (2012)	Problem Set 2 due
Wednesday 2/19	RSA model in applications	Andreas & Klein (2016), Cohn-Gordon et al. (2018)	
Monday 2/24	Anaphora resolution: rule-based model	Lappin & Leass (1994)	
Wednesday 2/26	Coreference systems: machine learning	Ng (2017), Durrett & Klein (2013), Lee et al. (2017)	
Monday 3/2	Dialogue act modeling	Stolcke et al. (2000)	
Wednesday 3/4	Chatbots	Zhang et al (2018), Wolf et al. (2019)	Problem Set 3 due
Wrap-up and presentations			
Monday 3/9	Topic TBD: students' choice		
Wednesday 3/11	Project presentations		
Finals			
Wednesday 3/18			Final paper due