

CS 594: LANGUAGE AND VISION

Spring 2019

Instructor:

Natalie Parde, Ph.D.

Location: BSB 315

Time:

Tuesday/Thursday

12:30-1:45 p.m.



Welcome to CS 594!

- Research at the intersection of natural language processing and computer vision
- Useful for helping AI systems understand the world in a more human-like way

Topics We'll Cover This Semester



Grounded
language learning



Physically situated
dialogue



Automated image
captioning



Automated video
description



Visual question
answering



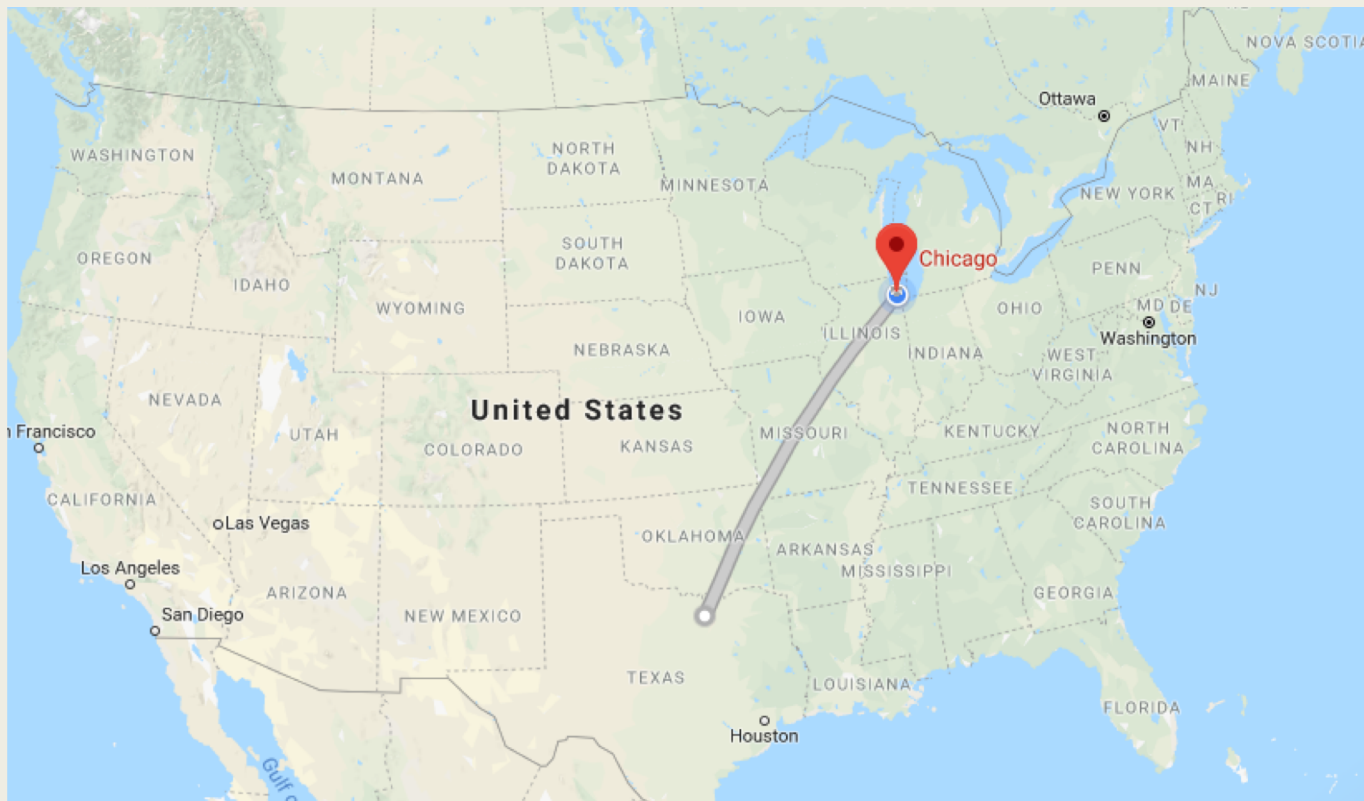
Text-to-image
generation



Visual story
entailment

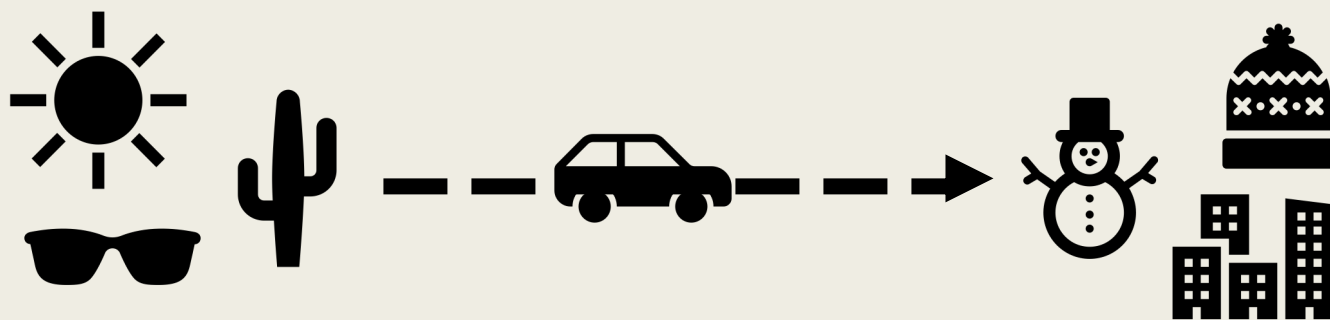


Language
disambiguation via
images



But first, an introduction....

- Recent Ph.D. grad
- Assistant Professor at UIC
- Co-Director of Natural Language Processing Laboratory: nlp.lab.uic.edu
- Research interests: language + vision, metaphor and sarcasm processing, NLP applications to robotics and healthcare



Now you!

- Based on the roster:
 - 32% *Ph.D.*
 - 68% *M.S.*
- Ph.D. students: who do you work with?
- M.S. students: thesis, project, or coursework?
- What made you interested in this class?
- What are you hoping to get out of it?



SYLLABUS TIME



Contact Info

- Email: parde@uic.edu
- Piazza: <https://piazza.com/uic/spring2019/cs594section33648> (all enrolled students were emailed a link to sign up)
- Course Website: http://natalieparde.com/teaching/cs594_spring2019.html
- My Office: SEO 1132
- Office Hours: Tuesday/Thursday 2-3 p.m. (right after class)

- Try to keep email to a minimum! Instead, post questions on Piazza.
- All assignments should be submitted on Blackboard.

Prerequisite/Corequisite

- If you have no background in natural language processing or machine learning, you will probably find this course challenging.
- Lectures covering those topics are designed as overviews only! More comprehensive introductions to NLP and ML will be in:
 - *CS 411: Artificial Intelligence/CS 511: Artificial Intelligence II*
 - *CS 412: Introduction to Machine Learning*
 - *CS 421: Natural Language Processing/CS 521: Statistical NLP*
 - *CS 514: Applied Artificial Intelligence*
 - *CS 559: Neural Networks*
- You can also acquire this background knowledge using other sources like research projects and online coursework.

What will we be reading?

- No textbook purchase necessary!
- For the first three weeks, refer to the following for additional details:
 - [*Speech and Language Processing*](#), by Dan Jurafsky and James H. Martin
 - [*Computer Vision: Algorithms and Applications*](#), by Richard Szeliski
 - [*Deep Learning*](#), by Yann LeCun, Yoshua Bengio, and Geoffrey Hinton
- For the remainder of the semester, we'll read and discuss research papers.

Assignments



Paper Critiques

Every paper discussion week



Paper Presentations

Summary

Pros

Cons



Project Presentations

Proposal

Update

Final Presentation



Project Write-Up



Project

Grade Breakdown

- **Paper Critiques: 24%** (3% Per Paper Critique)
- **Paper Presentations: 26%** (10% Summary, 8% Pros, 8% Cons)
- **Project Presentations: 20%** (5% Proposal, 5% Update, 10% Final Presentation)
- **Project Write-Up: 15%**
- **Project: 15%**



Missed Class

- If you discover that you'll miss one of your scheduled presentations, contact me as soon as possible. I'll either:
 - *Reschedule it*
 - *Assign a video presentation due the same day*
- If you don't contact me ahead of time, I'll deduct:
 - *25% as soon as class begins*
 - *An additional 50% at that time the following day*
 - *The remaining 25% at that time the day after that*

Late Cards

- A late card allows you to turn in your assignment up to 24 hours after the deadline with no grade penalty
- 4 per semester
- It's fine to use multiple late cards for the same assignment
- If you have no late cards remaining (or choose not to use them for a given assignment):
 - *25% deducted for each day the assignment is late, starting a minute after it is due*



Honor Code

- Do your own work!
- You're welcome (and encouraged) to discuss your project with your peers, but if someone contributes intellectually in some way to your work, make sure you acknowledge it in your presentations/write-up/etc.
- Cheating/academic dishonesty:
 - *First offense: 0 on the assignment*
 - *Subsequent offenses: 0 on the assignment + report to the Director of Graduate Studies and CS Student Affairs*

Schedule

Week	Topic	Deliverables
1/14-1/18	Introduction and NLP Overview	—
1/21-1/25	NLP and CV Overview	Paper Selection: 1/26 by 11:59 p.m.
1/28-2/1	Deep Learning Overview	Pros and Cons Selections: 2/2 by 11:59 p.m.
2/4-2/8	Project Proposals	In-Class Presentations
2/11-2/15	Principles of Grounded Language Learning	Paper Critique: 2/11 by 12:00 p.m.
2/18-2/22	Game-based Grounded Language Learning	Paper Critique: 2/18 by 12:00 p.m.
2/25-3/1	Physically Situated Dialogue	Paper Critique: 2/25 by 12:00 p.m.
3/4-3/8	Learning via Observation, Scripts, and Dialogue	Paper Critique: 3/4 by 12:00 p.m.
3/11-3/15	Automated Image Captioning and Image-Text Alignment	Paper Critique: 3/11 by 12:00 p.m.
3/18-3/22	Project Updates	In-Class Presentations
3/25-3/29	Spring Break	—
4/1-4/5	Automated Video Description and Visual Story Entailment	Paper Critique: 4/1 by 12:00 p.m.
4/8-4/12	Visual Question Answering and Text-to-Image Generation	Paper Critique: 4/8 by 12:00 p.m.
4/15-4/19	Language Disambiguation via Images	Paper Critique: 4/15 by 12:00 p.m.
4/22-4/26	Project Presentations	In-Class Presentations (Some Students) Final Project: 4/22 by 12:00 p.m.
4/29-5/3	Project Presentations	In-Class Presentations (Some Students) Final Paper: 5/3 by 12:00 p.m.
5/6-5/10	Finals Week (No Class)	—

Classroom Environment

- Treat everyone with respect!
 - *Silence cellphones and laptops*
 - *Don't chat with one another during presentations (unless explicitly asked to do so)*
 - *Don't bring disruptive food*
- Inform me and UIC's Disability Resource Center (<http://drc.uic.edu/>) about any disabilities for which you would like to request accommodation.
- Let me know if you'd like me to update any of the information I've received about you from the class roster.
- Feel free to reach out to me with feedback throughout the semester!



Think, Pair, Share

- Write three project ideas on your notecard
- Talk about those project ideas with a partner
- Feel free to share any that you find interesting

- Timer:
<https://www.google.com/search?q=timer>



What to do now?

- Continue thinking of project ideas!
 - *Feel free to send me a message on Piazza or stop by my office hours if you'd like help brainstorming topics.*
- Read through the course materials on Blackboard.
- Select the paper you'd like to give your summary presentation on, and leave a comment indicating that paper on the Paper Selections Wiki.
 - *Suggested (and pre-approved) discussion papers are listed in the Reading Material section on Blackboard.*