

CS 594: LANGUAGE AND VISION

Spring 2019

Instructor:

Natalie Parde, Ph.D.

Location: BSB 315

Time:

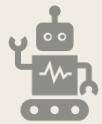
Tuesday/Thursday
12:30-1:45 p.m.

A photograph of a white humanoid robot, specifically a Pepper robot, standing in a city street at night. The robot is holding a tablet in its right hand and appears to be interacting with a black trash can. The background shows city buildings and signs, including one for "LEE".

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



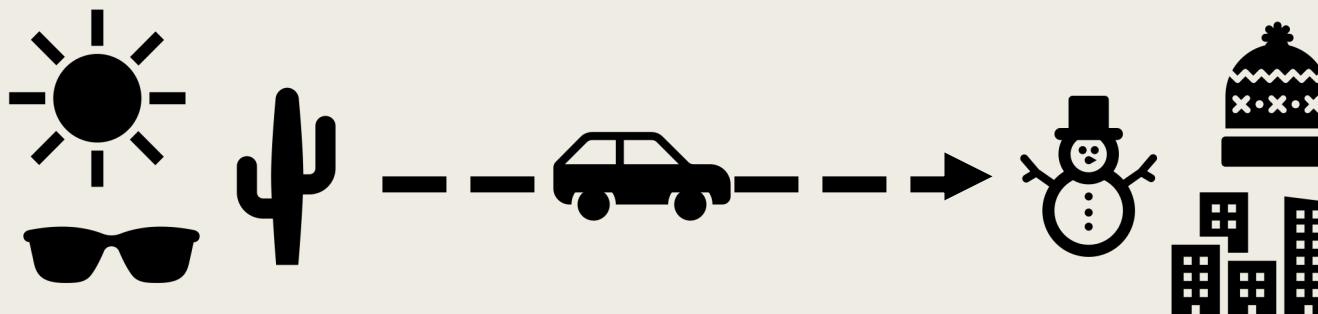
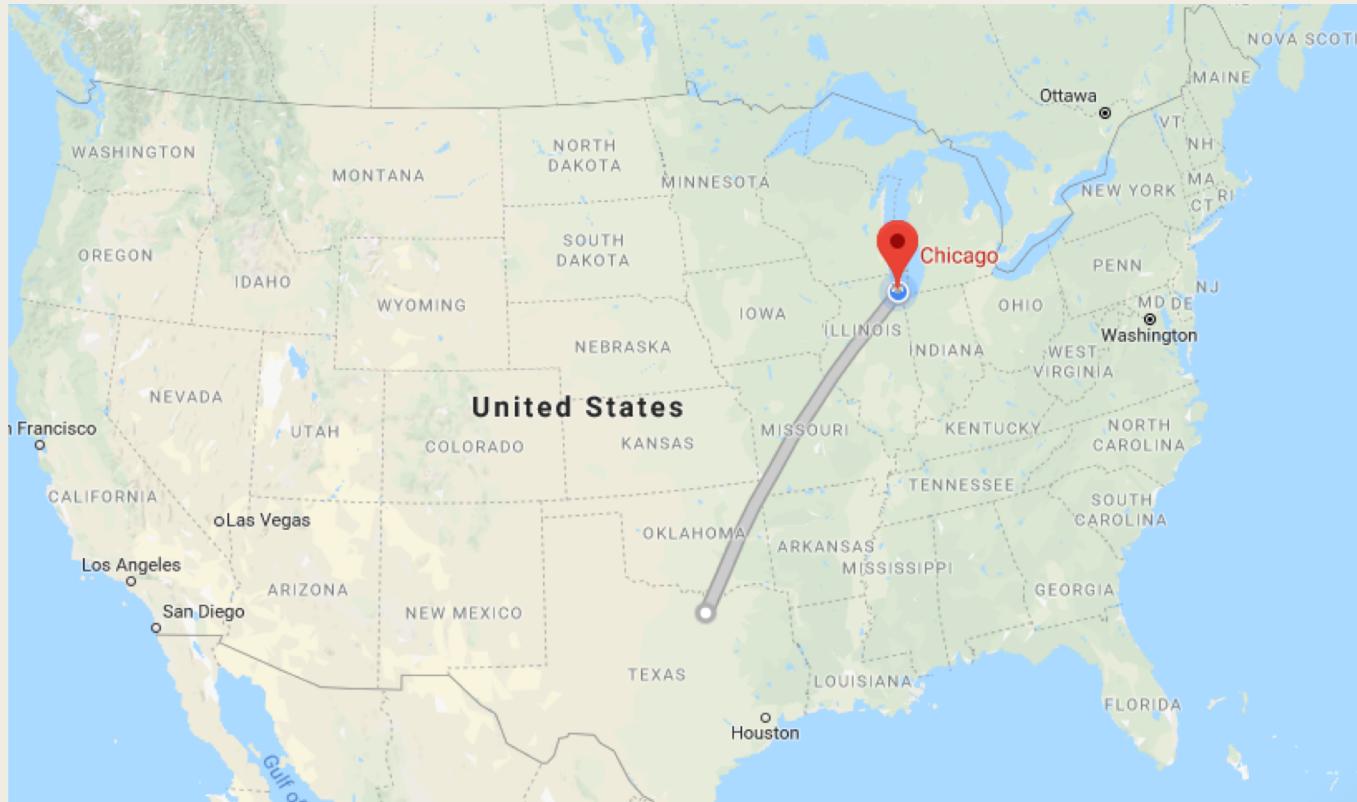
Text-to-image
generation



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.*