

STOR566: Introduction to Deep Learning

Lecture 1: Overview

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UNC Chapel Hill

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Outline

- Course information
- Overview of machine learning

Course Information - Instructor

Instructor:

- Name: Yao Li
- Email: yaoli@email.unc.edu
- Office Hours: TTH 11AM-12PM, Hanes 334
- Course Website: <https://liyao880.github.io/stor566/>

Course Information - Tutorial

Tutorial

- Length: 30min
- Topic: homework review and coding
- Time: Check the [Course Website](#)

Don't forget to bring your laptop on tutorial day.

Course Information - Assistant

TA:

- Name: Minji Kim
- Email: mkim5@unc.edu
- Office Hours: W 10AM - 12PM
- zoom link: <https://zoom.us/j/5869650522?pwd=bHJ0cnVscFIvblJaSk5idFVuWwFXUT09> (Passcode:stor566)

Grader:

- Name: Zheng Bao
- Email: zhengbao@email.unc.edu

Course Information - General

- There is no textbook. Most of the topics are covered in
 - “Elements of Statistical Learning” (by Friedman, Tibshirani, and Hastie)
 - “Deep Learning” (by Goodfellow, Bengio, Courville)

Topics

- Deep Learning Foundation
 - Background (Linear model, loss function, generalization)
 - Optimization
 - Neural network and back-propagation
 - Basic training techniques (e.g., dropout, normalization)
- Convolutional Neural Network and Computer Vision:
 - CNN, GAN, ...
- Recurrent neural network and NLP:
 - RNN, word2vec, NLP pipeline
- Transformer for Vision and NLP
- Graph neural networks
- Advanced topics:
 - Adversarial Robustness
 - Interpretability
 - ...

Grading

- Homework (40%)
 - 5 homeworks (tentative)
- Final project (50%)
- Participation (10%)

A	94 to 100	B	83 to 86.99	C	73 to 76.99	D	60 to 66.99
A-	90 to 93.99	B-	80 to 82.99	C-	70 to 72.99	F	0 to 59.99
B+	87 to 89.99	C+	77 to 79.99	D+	67 to 69.99		

Homework

- Around 5 homeworks will be assigned and will be collected via Sakai.
- Late homework will receive a grade of 0.
- You are allowed to work with other students but identical solutions will receive 0.
- Questions regarding HW grade should be addressed to the grader.

Participation

Quiz:

- There will be around 10 in-class quizzes.
- The final participation score would be $10 \times n \times \frac{m}{n}$
- n : the total number of quizzes
- m : total scores you got from all the quizzes. Each quiz is worth 0 to 1 point.

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Extra credit: Paper presentation

- Score: 10 points.
- Check the paper list on the course website.
- Discuss with the instructor.
- Each student can only do it once. Each paper can have at most two presenters.

Final project

- Group of 4 students.
- Form the group before August 30th, and sign up using the shared [spreadsheet](#).
- Four parts:
 - ① Project Proposal (10%)
 - ② Project Presentation (30%)
 - ③ Project Paper (50%)
 - ④ Peer score (10%)

Final project - Topics

- Work on some research projects:
 - Solve an interesting problem or new problem with existing method
 - Develop a new algorithm
 - Compare state-of-the-art algorithms on some problems
 - ...
- I'll recommend some topics in the course.

Final project - Proposal

Project Proposal:

- Page limit: 2 (excluding reference)
- Latex template at [link](#)
- Contains:
 - ① Problem Description
 - ② Related Works
 - ③ Proposed Work
 - ④ Evaluation Metric
 - ⑤ Reference
- Project Proposal Meeting

Final project - Presentation

Project Presentation:

- All groups will present their final projects in the last two lectures before Thanksgiving.
- Every group member is expected to join the presentation.
- The length of the presentation depends on the number of groups (10–20min).

Final project - Paper

Project Paper:

- Each team must submit a written project report:
 - Introduction
 - Related Works
 - Proposed Work
 - Experiments
 - Conclusion and Future Directions
- It is required to use the [NeurIPS Latex style files](#) and submit the report in PDF format.
- The report should be less than 8 pages (excluding references).

Final project - Peer Review

Peer score:

- Each group member should score every person in their group on a continuous scale from 0 (Bad) to 10 (Good).
- Deadline: same as the project paper
- Survey: [link](#)
- 2 points penalty for late or no submission

Final project

Important Dates:

Part	Description	Method of Submission	Due Date (Time)
P1	Project Proposal	Sakai	Sep. 25 (11:55PM)
	Proposal Meeting	Hanes 334	Sep. 27 / Sep. 29 (8:00AM-9:15AM)
P2	Presentation Slides	Sakai	Nov. 16 / Nov. 21 (11:55PM)
	Final Presentation	Class	Nov. 17 / Nov. 22 (8:00AM-9:15AM)
P3	Final Report	Sakai	Nov. 30 (11:55PM)
P4	Peer Score	Google Survey	Nov. 30 (11:55PM)

Thank you