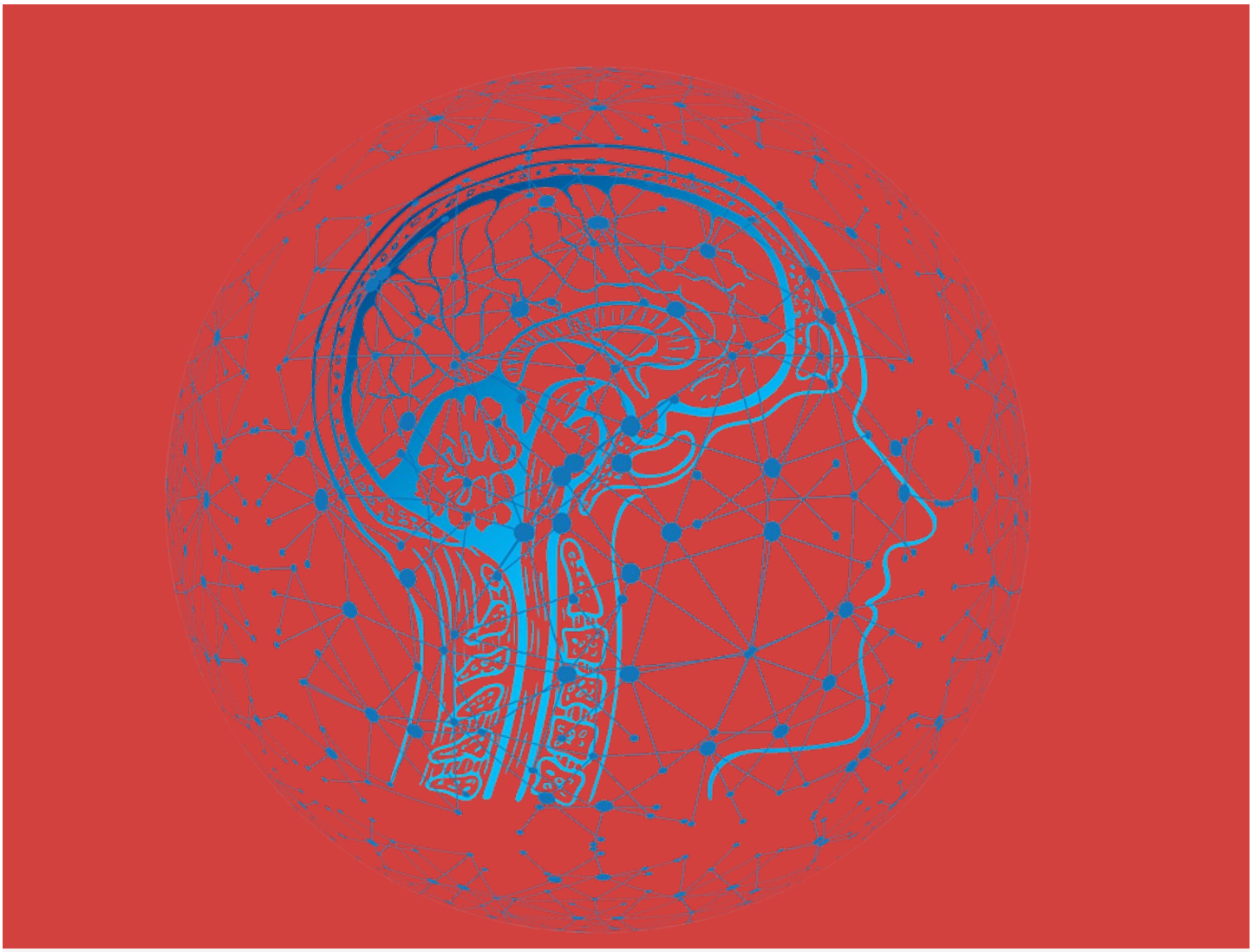
DEEP LEARNING

CLASS OVERVIEW

This course covers the fundamentals of deep neural networks at the graduate level. We introduce multi-layer perceptrons, back-propagation, and automatic differentiation. We will also discuss Convolutional Neural Networks, Recurrent Neural Networks, Transformers, and advanced topics in deep learning. The course will be a combination of lectures, presentations, and machine learning competitions.

- ***Lecturer**: Qi (Rose) Yu (roseyu@ucsd.edu)*
- ***TA**:*
  - *Rui (Ray) Wang (ruw020@ucsd.edu)*
  - *Abhishek Tanpure (atanpure@ucsd.edu)*
  - *Panini Bhamidipati (abhamidipati@ucsd.edu)*
- ***Lecture**: 3:30 pm - 4:50 pm PT, Tuesday, Thursday, CENTR 212*
- ***Discussion**: 12:00 pm - 12:50 pm PT, Friday, CSB 002*
- ***Office Hour**:*
  - *Rose Yu | 5:00 pm - 6:00 pm | Monday |EBU3B 3208*
  - *Rui (Ray) Wang | 9:00 am - 10:00 am | Friday | B240A - CSE Basement*
  - *Abhishek Tanpure | 5:00 pm - 6:00 pm | Tuesday |B270A - CSE Basement*
  - *Panini Bhamidipati | 5:00 pm - 6:00 pm | Thursday |B270A - CSE Basement*
- ***Canvas**: https://canvas.ucsd.edu/courses/45077*
- ***Piazza**: https://piazza.com/ucsd/spring2023/cse251b*



SYLLABUS

Week 1 (April 3rd)	*Introduction and Background*	*HW 1 release*
Week 2 (Apr 10th)	*Multi-layer perceptron*	
Week 3 (Apr 17th)	*Automatic Differentiation*	*HW 2 release*
Week 4 (Apr 24th)	*Convolutional neural network*	
Week 5 (May 1st)	*Recurrent neural network*	*HW3 release*
Week 6 (May 8th)	*Mid-term week*	
Week 7 (May 15th)	*Deep learning implementation*	*HW 4 release*
Week 8 (May 22nd)	*Attention and Transformer*	*Milestone report due*
Week 9 (May 29th)	*Graph neural network*	

Week 10 (June 5 th)	*Presentation week*	*Final report due*

LECTURES

Lecture Slides

Latex Template

- *Homework Template*
- *Presentation Template*
- *Project Template*

CLASS ASSESSMENT

- *40 % homework (10% x 4)*
- *35 % Kaggle competition*
  - *5 % milestone report*
  - *10 % final report*
  - *10 % final presentation*
  - *10 % competition ranking*
- *25 % Mid-term exam*

RESOURCES

Kaggle Competition

- *Competition Page*

Reading Materials

- *[1] Machine Learning Crash Course*
- *[2] Deep Learning Book*
- *[3] Learning from Data*

Other Tutorials

- *Deep Generative Models.*
- *Generative Adversarial Networks.*
- *Dive Deep Into Deep Learning*

FAQ

Q: What are the pre-requisites?

- *(MATH 31BH or MATH 20C) and (ECON 120A or ECE 109 or CSE 103 or MATH 181A or MATH 183, MATH 170A);*
- *Proficiency in Python.*

Q: Can first year undergraduates take this course?

- *Restricted to students with sophomore, junior, or senior standing within the CS25, CS26, CS27, CS28, EC26, and DS25 majors.*
- *All other students will be allowed as space permits.*

About me

My Chinese name is Qi Yu. That is also the instructor's name in the registrar's office. I publish under the name Rose Yu. You can learn more about my research at my personal website.

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