Computer Vision:
Last chapter

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Course outline

1. Low-level vision

2. Machine learning

3. Deep learning

4. Learning-based vision

5. Advanced topics

Course outline

Low-level vision

lecture 1	Introduction
lecture 2	Math review
lecture 3	Image filtering
lecture 4	Hough transform
lecture 5	Corner detection
lecture 6	Image descriptor
lecture 7	recitation: pytorch

Course outline

Machine learning

lecture 8	machine learning
lecture 9	pca
lecture 10	kmeans
lecture 11	logstic regression
lecture 12	recitation: project

Course outline

Deep learning

lecture 13	neural network
lecture 14	training neural networks
lecture 15	cnn & rnn
lecture 16	transformer

Course outline

Learning-based vision

lecture 17	object detection
lecture 18	camera-only detection
lecture 19	image segmentation
lecture 20	video understanding
lecture 21	self-supervised learning (weidi xie)
lecture 22	3D point cloud processing (wang he)
lecture 23	3d detection & segmentation

Course outline

Advance topics

lecture 24	nvidia research (zhiding yu)
lecture 25	GNN & casual relational inference
lecture 26	motion & trajectory prediction
lecture 27	autonomous driving (hang zhao)
lecture 28	GAN, normalization flow, diffusion

Assignment

1. Warm Up

2. Python Programming

3. Image Processing

4. Machine Learning

5. Neural Networks & Object Detection (bonus deadline: Aug 5th)

6. Graph neural networks (deadline: Aug 1st)

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Project

1. Proposal

2. Progress report

3. Final report (deadline: Aug 5th)

4. Video presentation (deadline: Aug 5th)

# Vision-related venue

AAAI 2023 (Aug. 15th)

CVPR 2023 (Nov. 11th)

Generous grading

Facts

1. First online course: Hard to interact, hard to get feedback

2. Tradeoff between quality and difficulty

3. TAs and I spent a lot of time

4. Mentally exhausted

5. I learn a lot during the process

Thoughts

1. I personally think I did wonderful job

2. Clearer course policy (late policy, covid)

3. More detailed assignment instructions and grading rubrics

4. Less assignment load each time, but ~~probably more frequently~~

5. More user-friendly cloud computing resource
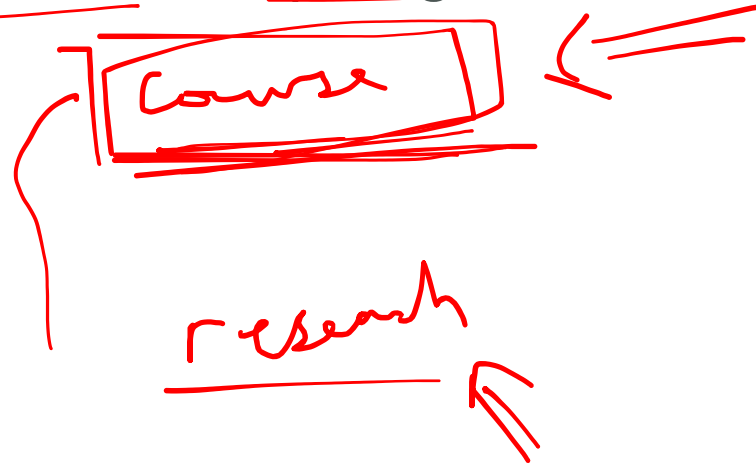
Any question about this course? Computer vision?

See you!

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