JOINT INSTITUTE
交大密西根学院

Course Syllabus

VE581

Convolutional Neural Networks for Visual Recognition

Summer 2019

Course Description:

Computer vision has played an important role in many applications such as in search, image understanding, mapping, medicine, drones, and self-driving cars. For those applications, visual recognition is the key task. Recently, deep learning (neural network) technique has advanced the performance of these state-of-the-art visual recognition systems. This course will cover selected core topics on computer vision and deep learning, such as image classification, localization, and detection with convolutional neural network. Students will learn to design their own neural networks to solve real-world problems, for example, medical imaging diagnosis. Through this course, students are expected to gain both theoretical and practical skills in computer vision and deep learning.

Instructor:

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Office hour: TBD

Textbook (Author, Book Title, Publisher, Publication Year, ISBN):

No required textbooks. Some topics will be covered from the following optional books:

Ian Goodfellow, Yoshua Bengio, and Aaron Courville. Deep Learning. MIT Press, 2016.

Andrew Glassner. Deep Learning Vol.1 & Vol. 2: From Basics to Practice. The Imaginary Institute, 2018.

Aston Zhang, Zachary C.Lipton, Mu Li, and Alexander J. Smola. Dive into Deep Learning. 2019.

Course Prerequisites:

Vv214/Vv417, Vv216/256/286, Ve281

Course Website:

https://umjicanvas.com

Grading Policy (Assignments %, Project, Exams, etc.):

Homework:	25%
Quiz:	10%
Midterm Exam 1:	20%
Midterm Exam 2:	20%
Final Project:	25%

Honor Code Policy:

When taking a course offered by JI, students must abide by JI Honor code policy for homework, quizzes, and exams, etc. Any suspected violation of the honor code will be reported to the Honor Council. The JI Honor Code is included in the undergraduate student handbook and also available at: http://umji.sjtu.edu.cn/academics/academic-integrity/honor-code/

(Tentative) Teaching Schedule:

Week	NO.	lectures and Exams	Comments
1	1	Introduction	
	2	Math Basics	
2	3	Machine Learning Basics	
	4	Image Classification	
3	5	Loss Function and Optimization	
	6	Introduction to Neural Networks	
4	7	Convolutional Neural Networks	
	8	Deep Learning Tools	
5	9	Review I	
	10	Midterm Exam I	
6	11	Deep Learning Tools	
	12	Guest Lecture (TBD)	
7	13	Train Convolutional Neural Networks	
	14	Train Convolutional Neural Networks	
8	15	CNN Architectures	
	16	Project Proposal Presentation	
9	17	Review II	
	18	Midterm II	
10	19	Recurrent Neural Networks	
	20	Detection and Segmentation	

11	21	Medical Imaging	
	22	Visualizing and Understanding	
12	23	Final Project Presentation	
	24	Final Project Presentation	
13	25	Final Project Report Due	
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Note: Teaching schedule is subject to change based on class progress and needs.