67190040 – Spring 2021

Artificial Intelligence

9:50am – 12:15pm, Monday, 玉泉教 7-308

Instructor:

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Course Website:

学在浙大 http://course.zju.edu.cn/

Course Objectives:

Artificial Intelligence (AI) encompasses a huge variety of subfields, ranging from the general learning and perception to the specific, such as playing chess, proving mathematical theorems, writing poetry, driving a car on a crowed street, and diagnosing diseases. This course introduces the foundational principles that drive these applications. Specific topics include search, game playing, logic, reasoning, learning, and Markov decision process. The main goal of the course is to equip you with the tools tackle new AI problems you might encounter in life.

Prerequisites:

Probability, Discrete Math, Programming (Python)

Required Textbook:

Stuart J. Russell and Peter Norvig, Artificial Intelligence: A Modern Approach, 3rd Edition, 清华大学出版社, 2011

Grading:

Grades are based on the following weights:

Homework + Projects	40%
Final Project	20%
Final Exam	40%

Problem Sets:

For the most part, problem sets will be assigned on a **bi-weekly** basis. Each will be made available on the web on the day of a lecture and collected two weeks after. **Problem sets that are handed in late will be acknowledged, but a grade multiplied by 0.5 will be recorded.**

These assignments are intended to provide you with practice using the ideas and concepts we will be developing and are an essential part of the process of mastering the course. Completing them is important to you in learning the material. Grading them is important to us in assessing how you are doing.

Projects：

During the semester there will be **TWO assignments** that are intended to complement the problem sets by providing you with a different experience in mastering and gaining an appreciation for the course material. The dates on which these will be handed out or posted on the web and the dates when they are due are listed in the course calendar. The write-ups for the labs should be fairly concise, including graphs, code, brief descriptions of what you did, etc. **As with problem sets, if a lab is handed in late, it will be acknowledged but the grade will be multiplied by 0.5.**

Final Project:

It is a team-work project. Each team is made up of 3 students in maximum. You need to select a topic by yourselves, give a poster, code, and submit a final report. **The due date is Jun. 28, 2021. Thus, we encourage you to start it as early as possible.**

Cooperative Work:

We fully recognize the potential value of students working or studying together, and we do not have any objection to this kind of cooperation, **so long as all participants are involved in all aspects of the work**, not with each doing only a fraction of the assignment. In particular, when

you hand in a paper with your name on it, we assume that you are certifying that the details presented are entirely your own work and that you played a substantial role at the conception stage. If part of the work was done cooperatively, that part should be indicated and the names of the students involved in the collaboration should be listed on each submitted paper.

Exams

There will be an exam during the Final Examination Period of the Summer semester. Students will have two hours to complete the exam. The final exam will cover all of the material in the subject. It is closed book. Calculators are allowed.

Tentative Outline

SES#	DATES		TOPICS
L1	Mar. 1		Introduction to AI
L2	Mar. 8	Problem -Solving	Search I: Uninformed Search + Heuristic Search
L3	Mar. 15		Search II: Adversarial Search + Monte Carlo Tree Search *Recitation I: Python Tutorial*
L4	Mar. 22		Constraint Satisfaction Problems
L5	Mar. 29	Logic	Logic + Inference
L6	Apr. 5	Uncertain Reasoning	Probability *Recitation II:*
L7	Apr. 12		Bayesian Network I: Representation
L8	Apr. 19		Bayesian Network II: Inference
L9	Apr. 26		Markov Network: Representation + Inference
L10	May 3		Lab *Recitation III:*
L11	May 10	Learning	Learning for PGM
L12	May 17		Classification
L13	May 24		Deep Learning
L14	May 31		Markov Decision Process
L15	Jun. 7		Reinforcement Learning *Recitation VI:*
L16	Jun. 21		*Final Project Presentation*
L17	Jun. 28		*Final Project Presentation*
E1	TBD		Final Exam