Course Syllabus
VE593
Problem Solving with AI Techniques
Fall 2018

Course Description:

This course presents a selection of artificial intelligence techniques that have proved to be efficient to solve general problems (notably reasoning/planning, learning or decision-making). Although the emphasis is on how to use those tools, relevant theoretical aspects are also overviewed to provide a solid foundation for their effective applications.

Instructor:

Name: Paul Weng
Email: paul.weng@sjtu.edu.cn
Phone: 3420 6075 (ext. 4061)
Office: Room 406
Office hour: To be determined with students

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

The course has no required textbooks, but will cover some topics from the following books:

S. Russell and P. Norvig. Artificial Intelligence: a Modern Approach. Pearson.

T. Hastie, R. Tibshirani, J. Friedman. The Elements of Statistical Learning. Springer.

I. Goodfellow, Yoshua Bengio, Aaron Courville. Deep Learning. MIT Press.

R.S. Sutton and A.G. Barto. Reinforcement Learning: an Introduction. MIT Press.

Course Prerequisites:

Necessary computer science and mathematical background covered in VE281, VE203, VV216/256/286

Course Website:

Lecture slides, assignments, and grades will be posted on the class webpage on Canvas. We will also use Piazza for announcements and discussions.

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

The students will be evaluated with:

1. Small projects to practice the AI techniques covered in this course (40%)
2. Oral presentation of a research paper (20%)
3. Mid-term exam and final exam (40%)

Any questions about the grading of the projects or exams must be brought to the attention of the instructor

within one week after the item is returned.

Honor Code Policy:

All students are expected to abide by the JI's Honor Code Policy. Although oral discussions with classmates are encouraged, all assignments and exams are individual efforts. Therefore reading or copying another's solution is strictly forbidden. In all cases in which we have reason to believe that cheating has occurred, we will submit relevant materials to the Honor Council for evaluation.

(Tentative) Teaching Schedule:

Week	NO.	Date	lectures and Exams	Comments
1	1	12/09	Introduction to AI; presentation of course content	
	2	14/09	Introduction to reasoning under certainty; uninformed search	
2	3	19/09	Informed search	
	4	21/09	Refresher on Probability	
3	5	26/09	Stochastic search	
	6	28/09	Monte Carlo tree search	
4	7	03/10	National holiday	
	8	05/10	National holiday	
5	9	10/10	Introduction to reasoning under uncertainty	
	10	12/10	Bayesian networks	
6	11	17/10	Markov models	
	12	19/10	Hidden Markov models	
7	13	24/10	Oral presentations	
	14	26/10	Introduction to machine learning	
8	15	31/10	Linear and logistic regressions	
	16	02/11	Neural network	
9	17	07/11	Convolutional neural network	
	18	09/11	Recurrent neural network	
10	19	14/11	Oral presentations	
	20	16/11	Decision-making and planning; Markov decision process	
11	21	21/11	Decision-making and learning; multi-armed bandit	
	22	23/11	Reinforcement learning	

12	23	28/11	Deep reinforcement learning	
	24	30/11	Oral presentations	
13	25	05/12	Ensemble methods; bagging	
	26	07/12	Ensemble methods; boosting	
14	27	12/12	Exam week	
	28	14/12	Exam week	