Artificial Intelligence

Jump to Today

CSE 240

Artificial Intelligence (AI) is defined as any task performed by a program or a machine that, if a human carried out the same activity, we would say the human had to apply intelligence to accomplish the task. This course provides major topics needed by graduate students in order to do research in the field of AI. The broad topics cov- ered in this course are divided into 4 main areas:

- Introduction to Machine Learning
- Planning and search algorithms
- Decision making (including Reinforcement Learning (RL))
- Deep Learning (DL)

Logistics:

Tuesday, Thursday
9:50 - 11:25
Rachel Carson Academy 240

Instructor: Narges Norouzi
Email: nanorouz@ucsc.edu (mailto:nanorouz@ucsc.edu)
Office Hours: Tuesdays 3:30 to 5 pm or by appointment
Office: Engineering 2, Room 357

Lab sections:

- Tues 1:30-2:35 Merrill Acad 130
- Wed 8:00-9:05 Baskin Engr 165
- Fri 10:40-11:45 Baskin Engr 165

TA:

- Rafael Espericueta - Email: **resperic@ucsc.edu (mailto:resperic@ucsc.edu)**
- **(mailto:resperic@ucsc.edu)** Jose Sepulveda - Email: **joasepul@ucsc.edu (mailto:joasepul@ucsc.edu)**
    - Office hours: Fridays 12-1pm at E2-475

Grader:

- Kevin Woodward - Email: **keawoodw@ucsc.edu (mailto:keawoodw@ucsc.edu)**

Learning Objectives:

Students completing this course should be able to:

- choose the appropriate representation for an AI problem or domain model,
- choose the appropriate algorithm for reasoning within an AI problem domain,
- implement and debug core AI algorithms in a clean and structured manner,
- design and analyze the performance of an AI system or component,
- describe AI algorithms and representations and explain their performance, and critically read papers on AI systems.

Prerequisite:

Enrollment is restricted to graduate students.

Recommended Textbook:

- AI topics: Russell Stuart and Peter Norvig. 2010. Artificial Intelligence: A Modern Approach. 3rd edition. Pearson.
- ML topics: Christopher M. Bishop. 2006. Pattern Recognition and Machine Learning (Information Science and Statistics). Springer.
- DL topics: Ian Goodfellow, Yoshua Bengio, and Aaron Courville. 2016. Deep Learning. MIT Press.

Piazza Site:

All announcements will be made on Piazza. All questions should be made through also through the Piazza site. Access Piazza though the Canvas site, signup through this link: **piazza.com/ucsc/winter2020/cse240 (http://piazza.com/ucsc/winter2020/cse240)**

(http://piazza.com/ucsc/winter2020/cse140) Webcast:

Lectures are listed at **webcast.ucsc.edu (https://webcast.ucsc.edu/)**. You will need the following credentials to access the site:

Username: cse-240-1
Password: norouzi-240

Grade Distribution:

2 Assignments	20%
2 Review Papers	10%
Project	45%
Attendance	5%
Quizzes	20%

Letter Grade Distribution:

>= 93.00	A	73.00 - 76.99	C
90.00 - 92.99	A-	70.00 - 72.99	C-
87.00 - 89.99	B+	67.00 - 69.99	D+
83.00 - 86.99	B	63.00 - 66.99	D
80.00 - 82.99	B-	60.00 - 62.99	D-
77.00 - 79.99	C+	<= 59.99	F

Diversity and Inclusivity Statement:

UC Santa Cruz is committed to creating an academic environment that supports its diverse student body. If you are a student with a disability who requires accommodations to achieve equal access in this course, please submit your Accommodation Authorization Letter from the Disability Resource Center (DRC) to me privately during my office hours or by appointment, preferably within the first two weeks of the quarter. At this time, I would also like us to discuss ways we can ensure your full participation in the course. I encourage all students who may benefit from learning more about DRC services to contact DRC by phone at 831-459-2089, or by email at drc@ucsc.edu (mailto:drc@ucsc.edu) .

Class Schedule:

Date	**Topic** (link to lecture slides and notes)	**Due**
1/7/2020	Introduction + AI	
1/9/2020	Review of Probability	

1/14/2020	Bayesian Networks	
1/16/2020	Logistic Regression	
1/19/2020		Forming Teams + proposal
1/21/2020	Intro to Neural Networks	
1/23/2020	Deep Neural Networks (1)	Quiz 1
1/28/2020	Deep Neural Networks (2)	
1/30/2020	Convolutional Neural Networks	
2/2/2020		Assignment 1
2/4/2020	Recurrent Neural Networks	
2/6/2020	Markov Decision Process	
2/11/2020	Reinforcement Learning	
2/13/2020	Uninformed Search	Quiz 2
2/16/2020		Review Paper 1 & Progress Report
2/18/2020	Informed Search	
2/20/2020	Local Search + Optimization	
2/25/2020	Adversarial Search	
2/27/2020	Constraint Satisfaction Programming (1)	

3/1/2020		Assignment 2
3/3/2020	Constraint Satisfaction Programming (2)	
3/5/2020	Reserved Lecture	Quiz 3
3/8/2020		Review Paper 2
3/10/2020	Reserved Lecture	
3/12/2020	Poster Presentation	
3/15/2020		Final Report

Note: lectures slides and notes will be posted immediately before the lecture

Course Summary:

Date	Details	
Sun Jan 19, 2020	**Proposal** (https://canvas.ucsc.edu/courses/29857/assignments/112768)	due by 11:59pm
Sun Feb 2, 2020	**Assignment 1** (https://canvas.ucsc.edu/courses/29857/assignments/112760)	due by 11:59pm
Sun Feb 16, 2020	**Progress Report** (https://canvas.ucsc.edu/courses/29857/assignments/112766)	due by 11:59pm
	Review Paper 1 (https://canvas.ucsc.edu/courses/29857/assignments/112761)	due by 11:59pm
Tue Mar 10, 2020	**Assignment 2 Code** (https://canvas.ucsc.edu/courses/29857/assignments/112762)	due by 11:59pm
	Assignment 2 Report (https://canvas.ucsc.edu/courses/29857/assignments/120498)	due by 11:59pm
Fri Mar 13, 2020		due by 11:59pm

Date	Details	
	Review Paper 2 (https://canvas.ucsc.edu/courses/29857/assignments/112846)	
Sun Mar 15, 2020	**Video Presentation** (https://canvas.ucsc.edu/courses/29857/assignments/112765)	due by 11:59pm
Tue Mar 17, 2020	**Final Report** (https://canvas.ucsc.edu/courses/29857/assignments/112764)	due by 11:59pm
	Project Code (https://canvas.ucsc.edu/courses/29857/assignments/112767)	due by 11:59pm
	Class Participation (https://canvas.ucsc.edu/courses/29857/assignments/112763)	
	Progress Check Meeting (https://canvas.ucsc.edu/courses/29857/assignments/117493)	
	Quiz 1 (https://canvas.ucsc.edu/courses/29857/assignments/112769)	
	Quiz 2 (https://canvas.ucsc.edu/courses/29857/assignments/112770)	
	Quiz 3 (https://canvas.ucsc.edu/courses/29857/assignments/112771)	