SJSU SAN JOSÉ STATE UNIVERSITY

College of Science · Computer Science

Introduction to Machine Learning Section 02

CS 171

Fall 2024 3 Unit(s) 08/21/2024 to 12/09/2024 Modified 09/01/2024

Contact Information

Instructor: Akash Nanavati

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Office Hours

Monday, Wednesday, 4:30 PM to 5:30 PM, DH282

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Office Hours

Tuesday, Thursday, 3:00 PM to 4:00 PM, DH282

Course Information

Lectures

Monday, Wednesday, 3:00 PM to 4:15 PM, MH225

Course Description and Requisites

Covers a selection of classic machine learning techniques including backpropagation and several currently popular neural networking and deep learning architectures. Hands-on lab exercises are a significant part of the course. A major project is required.

Prerequisite(s): CS 146 (with a grade of "C-" or better). Computer Science or Software Engineering majors only.

Letter Graded

Program Information

Diversity Statement - At SJSU, it is important to create a safe learning environment where we can explore, learn, and grow together. We strive to build a diverse, equitable, inclusive culture that values, encourages, and supports students from all backgrounds and experiences.

Course Learning Outcomes (CLOs)

The focus of this course will be machine learning, with examples from fields such as computer vision and natural language processing. After completing this course students should have a working knowledge of a wide variety of machine learning topics, tools, and techniques, and how to apply them to real-world problems.

Course Materials

Hands-On Machine Learning with Scikit-Learn, Keras, and TensorFlow

Author: Aurélien Géron
Publisher: O'Reilly
Edition: 3rd Edition

Online (https://learning.oreilly.com/library/view/hands-on-machine-learning/9781098125967/)

Grading Information

Percentage range	Grade range
90-100	A- to A+
80-89	B- to B+
70-79	C- to C+
60-69	D- to D+
0-59	F

Breakdown

Homeworks (5) - 25%
In-class exams (2) - 50%
Final project & presentation (1) - 25%

University Policies

Per University Policy S16-9 (PDF) (http://www.sjsu.edu/senate/docs/S16-9.pdf), relevant university policy concerning all courses, such as student responsibilities, academic integrity, accommodations, dropping and adding, consent for recording of class, etc. and available student services (e.g. learning assistance, counseling, and other resources) are listed on the Syllabus Information (https://www.sjsu.edu/curriculum/courses/syllabus-info.php) web page. Make sure to visit this page to review and be aware of these university policies and resources.

Course Schedule

Topics

- Why learn ML
- Regression, Classification
- ANN, Perceptron, MLP
- Backpropagation
- Deep Nets
- Transformers
- CNN, RNN, LSTM, Computer Vision applications
- LLMs and Applications
- SVM, Trees
- Reinforcement Learning

Course Schedule Outline

Date	Day of Week	Week number	Lecture number	Topic
8/21	W	1	1	First day of classes. Why learn ML, Intro to Python and Colab. Assignment-1 is out.
8/26	M	2	2	Linear Regression
8/28	W	2	3	Linear Algebra. Assignment-1 is due.
9/2	M	3		Holiday for Labor Day
9/4	W	3	4	Linear Algebra. Assignment-2 is out.
9/9	M	4	5	Classification
9/11	W	4	6	Artificial Neural Networks, Perceptron

9/16	M	5	7	Multi-Layer Perceptron
9/18	W	5	8	Backpropagation. Assignment-2 is due. Assignment-3 is out.
9/23	M	6	9	Deep Nets
9/25	W	6	10	Transformers
9/30	M	7	11	Transformers
10/2	W	7	12	Review for exam-1. Assignment-3 is due.
10/7	M	8		In-class Exam-1
10/9	W	8		Answers to Exam-1
10/14	M	9	13	Final project ideas
10/16	W	9	14	CNN, RNN, LSTM
10/21	M	10	15	Computer Vision application. Assignment-4 is out.
10/23	W	10	16	Large Language Models
10/28	M	11	17	Applications on LLMs
10/30	W	11	18	SVM. Assignment-4 is due. Assignment-5 is out.
11/4	M	12	19	Trees
11/6	W	12	20	Autoencoders
11/11	M	13		Holiday for Veteran's Day
11/13	W	13	21	Reinforcement Learning. Assignment-5 is due.
11/18	M	14	22	Reinforcement Learning
11/20	W	14	23	Review for exam-2
11/25	M	15		In-class Exam-2
11/27	W	15		Non-Instructional Day (day before Thanksgiving)
12/2	M	16		Presentations - extra hour in (room)
12/4	W	16		Presentations - extra hour in (room)