San José State University
Department of Computer Science
CS185C, Advanced Practical Computing Topics, Section 3, Spring, 2020

Course and Contact Information

Instructor:	Fabio Di Troia
Office Location:	MH217
Telephone:	
Email:	fabio.ditroia@sjsu.edu
Office Hours:	TR, 15:00 – 16:00
Class Days/Time:	TR 12:00pm
Classroom:	DH450
Prerequisites:	CS 46B (with a grade of "C-" or better); Computer Science, Applied and Computational Math, or Software Engineering Majors only.

Course Format

Faculty Web Page and MYSJSU Messaging

Course materials such as syllabus, handouts, notes, assignment instructions, etc. can be found on Canvas Leaning Management System course login website at http://sjsu.instructure.com. You are responsible for regularly checking with the messaging system through MySJSU at http://my.sjsu.edu (or other communication system as indicated by the instructor) to learn of any updates.

Course Description

Topics in machine learning. The following machine learning techniques and related topics are covered in detail: hidden Markov models (HMM), profile hidden Markov models (PHMM), principal component analysis (PCA), support vector machines (SVM), clustering, data analysis, backpropagation and selected topics in neural networks. Illustrative applications of each of these major topics are provided, with most of the applications drawn from the field of information security. In addition, the course will include an overview of TensorFlow 2 and its applications, with additional topics as time permits.

Course Learning Outcomes (CLO)

The focus of this course will be machine learning, with illustrative applications drawn primarily from the field of information security. After completing this course students should have a working knowledge of a wide variety of machine learning topics, and have a good understanding of how to apply such techniques to real-world problems.

Required Texts/Readings

Textbook

Machine Learning with Applications in Information Security (https://www.crcpress.com/Introduction-to-Machine-Learning-with-Applications-in-Information-Security/Stamp/p/book/9781138626782), by Mark Stamp, published by Chapman Hall/CRC in 2017.

Other Readings

None

Other technology requirements / equipment / material

None

Course Requirements and Assignments

SJSU classes are designed such that in order to be successful, it is expected that students will spend a minimum of forty-five hours for each unit of credit (normally three hours per unit per week), including preparing for class, participating in course activities, completing assignments, and so on. More details about student workload can be found in University Policy S12-3 at http://www.sjsu.edu/senate/docs/S12-3.pdf.

Homework, Midterm and Final exam are expected for this class. Homework is due on Canvas by class starting time on the due date. Each assigned problem requires a solution and an explanation (or work) detailing how you arrived at your solution. Cite any outside sources used to solve a problem. When grading an assignment, I may ask for additional information.

NOTE that University policy F69-24 at http://www.sjsu.edu/senate/docs/F69-24.pdf states that "Students should attend all meetings of their classes, not only because they are responsible for material discussed therein, but because active participation is frequently essential to insure maximum benefit for all members of the class. Attendance per se shall not be used as a criterion for grading."

Final Examination or Evaluation

The final test will be published on Canvas and will be submitted online.

Grading Information

- Homework, 25%
- Midterm 1, 25%
- Midterm 2, 25%
- Final, 25%

Note that "All students have the right, within a reasonable time, to know their academic scores, to review their grade-dependent work, and to be provided with explanations for the determination of their course grades." See University Policy F13-1 at http://www.sjsu.edu/senate/docs/F13-1.pdf for more details.

Determination of Grades

Semester grade will be computed as a weighted average of the scores obtained in each of the three categories listed above.
No make-up tests or quizzes will be given and no late homework (or other work) will be accepted. Also, in-class work must be completed in the section that you are enrolled in.

Nominal Grading Scale:

Percentage	Grade
92 and above	A
90 – 91	A-
88 – 89	B+
82 – 87	B
80 – 81	B-
78 – 79	C+
72 – 77	C
70 – 71	C-
68 – 69	D+
62 – 67	D
60 - 61	D-
59 and below	F

Classroom Protocol

- **Cheating** will not be tolerated.
- Student must be respectful of the instructor and other students. For example, No disruptive or annoying talking.
- Turn off cell phones
- Class begins on time
- Valid picture ID required at all times

University Policies (Required)

Per University Policy S16-9, university-wide policy information relevant to all courses, such as academic integrity, accommodations, etc. will be available on Office of Graduate and Undergraduate Programs' Syllabus Information web page at http://www.sjsu.edu/gup/syllabusinfo/". Make sure to review these policies and resources.

CS185C / Advanced Practical Computing Topics, Spring 2020, Course Schedule

The schedule is subject to change with fair notice communicated via Canvas course page

Course Schedule

Week	Date	Topics, Readings, Assignments, Deadlines
1	01/23	Introduction
2	01/28	Introduction
2	01/30	Types of Machine Learning
3	02/4	TensorFlow 2
3	02/6	TensorFlow 2
4	02/11	Artificial Neural Networks
4	02/13	Artificial Neural Networks
5	02/18	Artificial Neural Networks
5	02/20	Artificial Neural Networks
6	**02/25**	**Midterm 1**
6	02/27	Hidden Markov Models
7	03/03	Hidden Markov Models
7	03/05	Hidden Markov Models
8	03/10	Profile Hidden Markov Models
8	03/12	Profile Hidden Markov Models
9	03/17	Profile Hidden Markov Models
9	03/19	Principal Component Analysis
10	03/24	Principal Component Analysis
10	03/26	Support Vector Machines
11	03/31	Support Vector Machines
11	04/02	Support Vector Machines
12	**04/07**	**Midterm 2**
12	04/09	Clustering
13	04/14	Clustering
13	04/16	TBD
14	04/21	TBD
14	04/23	TBD

Week	Date	Topics, Readings, Assignments, Deadlines
15	04/28	TBD
15	04/30	TBD
16	05/05	TBD
16	05/07	Wrap-up
Final Exam	05/13	Time: 0945-1200