THE UNIVERSITY OF TEXAS AT TYLER
DEPARTMENT OF COMPUTER SCIENCE
COSC4381 Seminar in Computer Science/ COSC5390 Topics in Computer Science: Artificial Intelligence Using Python
Spring 2020

Instructor: Nary Subramanian, Ph.D.
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Lecture: TR 8.00 am to 9.20 am COB 211

Office Hours: TR 10.50 am to 12:20 pm

Text: *Python Machine Learning: Machine Learning and Deep Learning with Python, scikit-learn, and TensorFlow 2* by Sebastian Raschka and Vahid Mirjalili, 3rd Edition (ISBN: 978-1-78995-575-0)

Catalog Description: This course is designed to study current trends in computer science or computer information systems.

Course Description: Artificial Intelligence (AI) has emerged as one of the most important areas of Computer ScienceData both from the viewpoint of the practitioner as well as the researcher. Automated image recognition, digital voice recognition, self-driving vehicles, medical diagnostics, and advanced robotics are fields that are heavily dependent on latest developments in AI. As of August 2019, there were about 7000 job openings for AI in the USA alone and job growth in AI is almost 30%. So knowledge of AI will help students in the fields of Computer Science, Computer Information Systems, and Information Technology, find high paying jobs almost immediately after college. A closely related aspect to AI is Machine Learning (ML): while AI predicts new knowledge, ML learns from the past data and helps with the predictions. One of the most widely used programming languages for AI is Python - in fact, for the month of January 2020, Python is ranked number 3 as the most popular programming language in the TIOBE index. In this course we will learn fundamentals of AI and ML by using Python for coding. All programming will be done using PyCharm community edition and Jupyter browser interface.

Grading: Grading will be based on exams and projects. All project submissions should be made electronically to Canvas – no physical paper submissions will be accepted. Late submissions will not be graded. There will be two mid-term exams as per schedule given later. Weights are given below:

First Midterm Exam	25%
Second Midterm Exam	25%
Final Exam	25%
Projects	25%

Grading Policy:

Points	Grade
≥85	A
≥75, < 85	B
≥65, < 75	C

Course Objectives:
1. Understand the difference between AI and ML
2. Know the underlying theory of AI algorithms
3. Select appropriate AI technique for a given problem
4. Develop an AI solution for a given problem
5. Implement the AI solution in the Python programming language

Tentative Schedule:

Week	Chapter	Topic
1	1	Introduction to AI and ML
2		Python Basics
3		Python Basics
4	2	Using ML for Classification
5	3	Classification Using scikit-learn
6	FIRST MIDTERM EXAM, Tuesday, February 18th, 2020	
6	4	Data Preprocessing
7	5	Dimensionality Reduction
8	8	Sentiment Analysis
9	9	Embedding ML in a Web Application
10	10	Regression Analysis
11	11	Clustering
12	SECOND MIDTERM EXAM, Tuesday, April 7th, 2020	
12	12	Multilayer Neural Network
13	13	TensorFlow
14	15	Classifying Images using CNN
15	FINAL EXAM, Week of April 27th, 2020 (as per University schedule)	

Census Date: January 27th, 2020

Attendance and Make-up Policy
It is in your interest to attend all classes. There will be no make-ups for missed exams. Missed exams will get a grade of zero.

University Policies
University policies can be seen at http://www.uttyler.edu/academicaffairs/files/syllabuspolicy.pdf.
They are given below as well.