Syllabus

CIS 6930 Deep Learning
-- Spring 2021

Schedule: F 2:00 pm - 4:45 pm
Location: Teams
Instructor: Yu Sun
Contact: yusun@usf.edu
Office Hours: Wednesday 9am - 12pm
Office hour location: Call through Teams
TA: Ahmad Babaeian Jelodar and Tianze Chen
TA Hours: TBD
TA office hour location: Call through Teams
Credit hours: 3

Objectives:

Students will learn -

Neural networks: single layer NN, logistic neurons, hidden layer, backpropagation.
Deep networks: multi-layer, convolutional neural network, recurrent neural networks, deep reinforcement learning.

Pre-Requisites:

Calculus (differential equations), probability/statistics, linear algebra, data structure, algorithms, machine learning, Python, English technical paper writing experience and training. Examples in the lectures will be in Python. There will be a prerequisite exam on day 1. Taking the prerequisite exam is required to continue the course.

Learning Outcomes:

Students will know how to design and implement shallow and deep neural networks. The students will know how to properly train deep neural networks with apply the trained networks to applications.

Textbooks, Tutorials, Lectures, Libraries, Frameworks, and Models:

On-line textbook/tutorial/resources:
Online Textbook https://www.deeplearningbook.org/
Tensorflow tutorials online: https://www.tensorflow.org/tutorials
Deep Learning (Stanford, 2018 lectures):
https://cs230.stanford.edu/lecture/
Deep Reinforcement Learning(UC Berkeley, 2019):
https://www.youtube.com/playlist?list=PLkFD6_40KJIwhWJpGazJ9VSj9CFMkb79A

Content (tentative):

Neural networks
Single layer neural networks

Hidden layer with logistic neurons
Loss functions
Actuation functions
Input and outputs
Backpropagation
Over fitting and computation problems
Regularization

Deep neural networks
Multi-layer neural networks
Convolutional neural network
Recurrent neural networks
Reinforcement Deep Learning

Turn in Homework and Projects through Turnitin on Canvas:

In this course, turnitin.com will be utilized. Turnitin is an automated system which instructors may use to quickly and easily compare each student's assignment with billions of web sites, as well as an enormous database of student papers that grows with each submission. Accordingly, you will be expected to submit all assignments in electronic format. After the assignment is processed, as instructor I receive a report from turnitin.com that states if and how another author's work was used in the assignment. For a more detailed look at this process visit http://www.turnitin.com.

Projects:

You will work on three individual projects. They are individual projects. They will be on CNN for state recognition, recurrent neural network for prediction and reinforcement learning for motion generation. The students will receive instructions on the projects from the TA and the professor.

Each project is composed of several smaller tasks and each of the task have their own deadlines. The submission of each task will be graded. The total score is the sum of the scores of all tasks.

For each project, the students are required to write a 4-page technical paper (double column) in a format that is acceptable to Arxiv (https://arxiv.org/). All submitted technical papers will be peer-reviewed by two other students in the class, TA, and one external student. Selected technical papers will be submitted to Arxiv and related conferences.

Grading:

Projects -100% (projects have an equal weight)
Two top scores out the three will be used to calculate the final grade.

Tentative Grading Scale:

The tentative grading scale could be as follows.
>= 90 A

>= 80 and < 90 B

>= 70 and < 80 C

<70 D

Grade Dissemination:

Graded tests and materials in this course will be returned individually only by request. You can access your scores at any time using "Grades" in Canvas.

Late Work Policy:

You can use total 7 late days for projects. Once you have used all 7 late days, your late submission will be assessed a penalty of 10% a day.

Grades of "Incomplete":

The current university policy concerning incomplete grades will be followed in this course.
For USF Tampa undergraduate courses and USFSM undergraduate and graduate courses: An “I” grade may be awarded to a student only when a small portion of the student’s work is incomplete and only when the student is otherwise earning a passing grade. The time limit for removing the “I” is to be set by the instructor of the course. For undergraduate students, this time limit may not exceed two academic semesters, whether or not the student is in residence, and/or graduation, whichever comes first. For graduate students, this time limit may not exceed one academic semester. “I” grades not removed by the end of the time limit will be changed to “IF” or “IU,” whichever is appropriate.
For USF Tampa graduate courses and USFSP undergraduate and graduate courses: An Incomplete grade ("I") is exceptional and granted at the instructor’s discretion only when students are unable to complete course requirements due to illness or other circumstances beyond their control. The course instructor and student must complete and sign the "I" Grade Contract Form that describes the work to be completed, the date it is due, and the grade the student would earn factoring in a zero for all incomplete assignments. The due date can be negotiated and extended by student/instructor as long as it does not exceed two semesters for undergraduate courses and one semester for graduate courses from the original date grades were due for that course. An "I" grade not cleared within the two semesters for undergraduate courses and one semester for graduate courses (including summer semester) will revert to the grade noted on the contract.

Attendance Policy:

The attendance will be routinely checked.

Departmental Policy:

All students enrolled in courses taught by the Computer Science and Engineering Department are advised that unless an instructor specifies otherwise, all work done in homework, programming, or exams must be the result of a student’s individual effort.

Students who copy, or who provide material for others to copy, or who show dishonesty in their work as described in the university catalog, will be subject to disciplinary action, typically the receipt of a failing grade in the course, but also

possible academic dismissal from the program.

Course Policy:

It is OK to discuss homework and projects with other students, but outright copying is not acceptable.
Don't copy anyone else's work.
Don't let anyone copy your work.
Don't copy from internet
We will check!
Departmental policy will be applied.

It is OK to discuss homework/projects with other students, but outright copying is not acceptable.

- Don't copy anyone else's work.
- Don't let anyone copy your work.
- We will check!
- You will receive FF for the course if you cheat in homework/projects/exam.

Communications:

Canvas (https://my.usf.edu/) will be used for all program submissions. Be sure you can log in and can find this class under the Courses tab. Be sure you can find Assignments for this class.
USF email will be used for any last-minute announcements. Be sure you can receive messages. Don't let backlog exceed your quota.
If you need help learning how to perform various tasks related to this course or other courses being offered in Canvas, please view the following videos or consult the Canvas help guides. You may also contact USF's IT department at (813) 974-1222 or help@usf.edu.

USF Standard Policies

https://www.usf.edu/provost/faculty/core-syllabus-policy-statements.aspx

* Every part of this syllabus is subject to adjustment.