COURSE NUMBER: HPE DSI 312
COURSE TITLE: Introduction to Deep Learning
INSTRUCTOR: Ioannis Konstantinidis
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Syllabus Changes: Due to the changing nature of the COVID-19 pandemic, please note that the instructor may need to make modifications to the course syllabus and may do so at any time. Notice of such changes will be announced as quickly as possible via MS Teams.

Course format: This course is being offered in the Synchronous Online format. Synchronous online class meetings will take place according to the class schedule. In between synchronous class meetings, there may also be asynchronous activities to complete (e.g., discussion forums and assignments).

Required Materials: None. Lecture notes will be provided via the course website.

Evaluation: Two projects worth 5 points each. Students must collect a total of at least 7 points to pass the course.

Course description: Deep learning refers to AI/ML techniques that utilize multilayer (deep) artificial neural networks. This branch of data science has seen exponential improvements in performance as our ability to collect, store, and process digital data has dramatically increased. Prediction, classification, regression, and identification of semi/unstructured data are areas where deep learning techniques exhibit a significant comparative advantage.

Course aims:

- To obtain an overview of the literature in deep learning methods and applications.
- To obtain the ability to implement and experiment with a wide range of deep learning algorithms in Python with examples: e.g., convolutional/diffusion networks and transformers/attention.
- To understand and implement deep learning-based methods for working with semi/unstructured data, such as images or language.

Prerequisites: HPE DSI 311 – Introduction to Machine Learning. Participants are also expected to follow the HPE DSI Training Roadmap (https://secure.hpedsi.uh.edu/training/).

Excused Absence Policy: Regular class attendance, participation, and engagement in coursework are important contributors to student success. Absences may be excused as provided in the University of Houston Undergraduate Excused Absence Policy and Graduate Excused Absence Policy for reasons including: medical illness of student or close relative, death of a close family member, legal or government proceeding that a student is obligated to attend, recognized professional and educational activities where the student is presenting, and University-sponsored activity or athletic competition. Additional policies address absences related to military service, religious holy days, pregnancy and related conditions, and disability.

Recording of Class: Students may not record all or part of class, livestream all or part of class, or make/distribute screen captures, without advanced written consent of the instructor. If you have or think you may have a disability such that you need to record class-related activities, please contact the Center for Students with DisABILITIES. If you have an accommodation to record class-related activities, those recordings may not be shared with any other student, whether in this course or not, or with any other person or on any other platform. Classes may be recorded by the instructor. Students may use instructor's recordings for their own studying and notetaking. Instructor's recordings are not authorized to be shared with *anyone* without the prior written approval of the instructor. Failure to comply with requirements regarding recordings will result in a disciplinary referral to the Dean of Students Office and may result in disciplinary action.

Academic Honesty: The University of Houston Academic Honesty Policy applies.

Counseling and Psychological Services: CAPS can help students who are having difficulties managing stress, adjusting to college, or feeling sad and hopeless. You can reach CAPS (www.uh.edu/caps) by calling 713-743-5454 during and after business hours for routine appointments or if you or someone you know is in crisis. Also, there is no appointment necessary for the "Let's Talk" program, which is a drop-in consultation service at convenient locations and hours around campus.