SIADS 642 Syllabus – FA23

Course Overview and Prerequisites

This course introduces the basic concepts of Neural Networks and Deep Learning. Students will learn the basic model types used in Deep Learning and their suitability for various data domains such as text, images, and videos. By the end of this course, students will be able to extract patterns from real-world datasets by running several classes of deep learning methods using existing code via standard API calls.

The course prerequisites are SIADS 502: Math Methods for Data Science, SIADS 505: Data Manipulation, and SIADS 542: Supervised Learning.

Instructor and Course Assistants

- Instructor: Paramveer Dhillon (dhillonp@umich.edu)
- Co-Instructors: Cory Bilyeu (cbilyeu@umich.edu), Ryan Maley (rjmaley@umich.edu)

Communication Expectations

Contacting instructor and course assistant: Please only use the course channel in Slack. Please ask all questions in public if possible so others can learn from your question. If you need to ask a private question please direct message both the instructors and the course assistants.

Email response time: 48 hours

Slack response time: 48 hours

Office Hours (EST/EDT): see the Google Calendar

Paramveer Dhillon: Thursday, 9 - 10 AM

Ryan Maley: Saturday, 8 - 9 AM

Cory Bilyeu: Monday, 7 - 8 PM

Textbook (Optional)

Deep Learning by *Goodfellow, Bengio, and Courville.* Available at the link for free. Copyright 2016 MIT Press.

Learning Outcomes

1. Learn how to modify state-of-the-art deep learning architectures for a new dataset/task.

2. Know the basic model types used in deep learning, e.g., Convolutional Neural Networks (CNNs), Recurrent Neural Networks (RNNs), and Generative Adversarial Networks (GANs).
3. Understand the basic concepts of neural networks and deep learning methods.
4. Know the suitability of specific deep learning methods to various real world data domains such as the ones arising from text, images, and videos.
5. Be able to re-train and tune hyperparameters of several classes of deep learning methods, in particular CNNs, RNNs, and GANs, on real-world datasets.
6. Be able to extract patterns from complex real world image and text datasets by using deep learning methods.

Course Schedule

This course **begins on Tuesday, October 24, 2023** and **ends on Monday, November 20, 2023.**

Grading

Course Assignment	**Percentage of Final Grade**
Week 1 Multiple-choice quiz	7%
Week 1 Jupyter Notebook Assignment	10%
Week 1 Jupyter Assignment - Staff Graded	10%
Week 2 Multiple-choice quiz	7%
Week 2 Jupyter Notebook Assignment	10%
Week 2 Jupyter Assignment - Staff Graded	10%
Week 3 Multiple-choice quiz	6%
Week 3 Jupyter Notebook Assignment	10%
Week 3 Jupyter Assignment - Staff Graded	10%
Week 4 Jupyter Notebook Assignment	10%

Course Assignment	Percentage of Final Grade
Week 4 Jupyter Assignment - Staff Graded	10%

Letter Grades, Course Grades, and Late Submission Policy

1 day late = 15% reduction; 2 days late = 30%; 3 days late = 50%; 4 days late = 0 points. **Extenuating circumstances will be considered (please reach out to the instructor as soon as possible).**

Percentage grades will be converted to letter grades using the following formula:

Total Assignment Score	Letter Equivalent
100	A+
95-99	A
90-95	A-
85-90	B+
80-85	B
75-80	B-
70-75	C+
65-70	C
60-65	C-
55-60	D+
50-55	D
<50	E

Accommodations

Refer to the Accommodations for Students with Disabilities section of the UMSI Student Handbook.

Use the Student Application Form in Accommodate to begin the process of working with the University's Office of Services for Students with Disabilities.

Accessibility

Screen reader configuration for Jupyter Notebook Content

Help Desk(s): How to get Help

- Degree program questions or general help - umsimadshelp@umich.edu
- Coursera's Technical Support (24/7) - https://learner.coursera.help/

Library Access

Refer to the U-M Library's information sheet on accessing library resources from off-campus. For more information regarding library support services, please refer to the U-M Library Resources section of the UMSI Student Handbook (access to the Student Orientation course required).

Student Mental Health

Refer to the University's Resources for Stress and Mental Health website for a listing of resources for students.

Student Services

Refer to the Introduction to UMSI Student Life section of the UMSI Student Handbook (access to the Student Orientation course required).