MSA 8600
Deep Learning Analytics

1. Instructor Information

TBD

2. Class Information

- **Location:** GSU Buckhead Center
- **Time:** TBD

3. Catalog Course Description:

This is an introductory and review course on historical development of neural networks and state-of-the-art approaches to deep learning. Students will learn the various deep learning methods, know how to design neural network architectures and training procedures through hands-on assignments. The course covers a variety of topics including neutral network basics, deep learning strategies such as GPU training and regulation, convolutional networks, recurrent neutral networks, the long short-term memory and other gated RNNs and unsupervised deep learning. Applications of using deep learning into natural language processing and image recognition will be discussed throughout the course.

4. Course Outcomes

By the end of the semester students will be able to:

- Understand the basics of neural networks
- Grasp various deep learning strategies such as GPU training and regulation
- Know the basic optimization approaches for training deep models
- Understand inputs, outputs and algorithms of convolutional networks
- Know recurrent neural networks and the long short-term memory and other gated RNNs

- Understand the basic methods of unsupervised deep learning

5. Textbooks and Resources

Lecture notes will be posted on *iCollege*.

Textbook:

- Ian Goodfellow, Yoshua Bengio and Aaron Courville. Deep Learning, The MIT Press, 2016.

6. Attendance Policy

Students are required to attend all lectures. It is strongly suggested that students do not miss class, as most students will have difficulties in exams without attending the lectures.

7. Grading

Percentages of course works in students' final scores are as follow:

Course Work	Percentage
Homework Assignments	20%
Quiz 1	25%
Quiz 2	25%
Project	30%

8. Course Schedule and Topics[1]

Class	Content	Readings	Note
Session 1	Introduction to neutral networks	Textbook: Chapter 6	
Session 2	Deep learning strategies (e.g., GPU training, regularization)	Textbook: Chapter 7	Homework 1 due

[1] This is a preliminary schedule. Some changes might be needed.

Session 3	Optimization for training deep models Convolutional neural networks	Textbook: Chapters 8 and 9	Homework 2 due Quiz 1
Session 4	Recurrent neural networks	Textbook: Chapter 10	Homework 3 due
Session 5	Long short-term memory and other gated RNNs	Textbook: Chapter 10	Homework 4 due
Session 6	Unsupervised deep learning	Textbook: Chapter 14	Quiz 2
Session 7	Project Presentation		Project report due