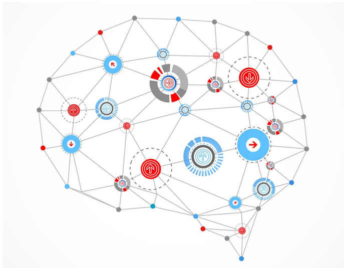

ELC 5396-06: Introduction to Deep Learning

9:05 AM–9:55 AM Monday, Wednesday, Friday

Rogers ECS Building 207

Dr. Liang Dong

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Phone: (254) 710-4589
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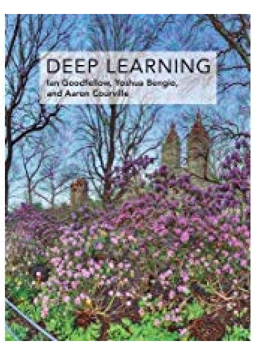
Office Location: Room 301B (Rogers ECS Building)
Office Hours: MW 2:30 – 4:30 PM; Other by appointment

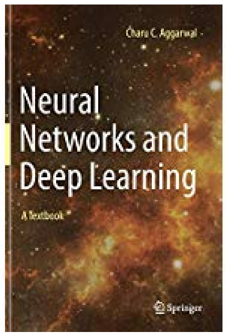
Course Description:
This course introduces deep learning of artificial intelligence. Deep learning is described as multi-layer abstraction, feature extraction, and non-linear processing. It can be classified as supervised learning and non-supervised learning. Students will learn basic principles such as backpropagation, stochastic gradient descent algorithm, momentum algorithm, parameter initialization method, and probability inference. Students will learn regularization methods such as pruning, weight decay, and sparseness against overfitting. This course also discusses parameter sharing, sparse representation, bagging, dropout, and data augmentation. This course will reveal today's deep learning methods such as restricted Boltzmann machines and multilayer perceptrons, convolutional neural networks, recurrent neural networks, deep reinforcement learning, and deep generative models (such as variational autoencoders and generative adversarial networks). These methods can be applied to audio and speech processing, image and video processing, natural language processing, data analysis, information synthesis, and automation.

Credit Hours: 3

Textbook 1: *Deep Learning*
The MIT Press (November 18, 2016)
Author(s): Ian Goodfellow, Yoshua Bengio, and Aaron Courville
ISBN-13: 978-0262035613



Textbook 2:	*Neural Networks and Deep Learning: A Textbook*
	Springer; 1st ed. 2018 edition (August 26, 2018)
Author(s):	Charu C. Aggarwal
ISBN-13:	978-3319944623



Note: Textbooks are not required but recommended. There will be handouts in the classroom.

Course Objectives:

At the completion of this course, you will learn:

1. Fundamentals of Deep Learning
2. Restricted Boltzmann Machines and Multilayer Perceptron
3. Convolutional Neural Networks
4. Recurrent Neural Networks
5. Deep Reinforcement Learning
6. Deep Generative Models

Computer Usage:

Some lectures during the semester will be taught in the Rogers Computer Lab. In the lab, you will learn to build, train, and test your AI deep learning models. You will get familiar with today's popular programming software for AI such as Python, TensorFlow, etc.

Evaluation:

There will be reading assignments. Reading assignments include reference book lecture notes reading and technical paper reading. The outcome of your reading assignments will be evaluated through classroom discussions and programming exercises.

Final Project:

The final project will be a comprehensive project using deep learning methods. The completion date and time are according to the online Baylor University Final Exam Schedule.

Grade Distribution:

Reading Assignments	20%
Classroom Discussions	20%
Lab Programming Exercises	20%
Final Project	40%