Syllabus

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0 Outline

1 Logistics

Class:	CS 6301.502.20S Special Topics in Computer Science – Convolutional Neural Networks
Link:	https://coursebook.utdallas.edu/search/searchresults/cs6301.502.20s/term_20s
Location:	Mon and Wed from 5:30 – 6:45 pm in ECSS 2.412
Office hrs:	TBA
TA:	TBA

2 Description

Description: This course provides an introduction to neural network variants (xNNs) including convolutional neural networks (CNNs), recurrent neural networks (RNNs) and attention based models. The course is motivated by the realization that many information extraction problems can be reduced to a classification or regression problem and neural networks are universal function approximators. Network design and training methods are discussed along with software and hardware requirements for high performance implementations. Theory and implementation are demonstrated and expanded on in the context of applications.

Outline:	Math	–	linear algebra, algorithms, probability, calculus and analysis
	Networks	–	design, training and implementation
	Applications	–	vision, language, speech and games

Objectives: Course learning objectives include:

1. Ability to design xNNs
2. Ability to train xNNs
3. Ability to implement xNNs
4. Ability to apply xNNs to applications including vision, language, speech and games

References: No required book to purchase, links to open source materials will be provided.

3 Plan

01	Mon Jan 13	Introduction
02	Wed Jan 15	Linear algebra
00	Mon Jan 20	Martin Luther King Day
03	Wed Jan 22	Linear algebra
04	Mon Jan 27	Algorithms
05	Wed Jan 29	Probability
06	Mon Feb 03	Probability
07	Wed Feb 05	Calculus
08	Mon Feb 10	Calculus
09	Wed Feb 12	Analysis
10	Mon Feb 17	Test 1: math
11	Wed Feb 19	Design
12	Mon Feb 24	Design
13	Wed Feb 26	Design
14	Mon Mar 02	Training
15	Wed Mar 04	Training
16	Mon Mar 09	Training
17	Wed Mar 11	Implementation
00	Mon Mar 16	Spring Break
00	Wed Mar 18	Spring Break
18	Mon Mar 23	Implementation
19	Wed Mar 25	Test 2: networks
20	Mon Mar 30	Vision
21	Wed Apr 01	Vision
22	Mon Apr 06	Language
23	Wed Apr 08	Language
24	Mon Apr 13	Speech
25	Wed Apr 15	Speech
26	Mon Apr 20	Games
27	Wed Apr 22	Games

28	Mon Apr 27	Summary
29	Wed Apr 29	Test 3: applications

4 Grades

25%	Test 1: linear algebra, algorithms, probability, calculus and analysis
25%	Test 2: network design, training and implementation
25%	Test 3: vision, language, speech and games
25%	Homework

No final exam