Syllabus

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0 Outline

1 Logistics

Class:	CS 6301.503.19S Special Topics in Computer Science – Convolutional Neural Networks
Link:	https://coursebook.utdallas.edu/search/searchresults/cs6301.503.19s
Location:	Mon and Wed from 5:30 – 6:45 pm in CR 1.202
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 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 Aug 19	Introduction
02	Wed Aug 21	Linear algebra
03	Mon Aug 26	Linear algebra
04	Wed Aug 28	Algorithms
00	Mon Sep 02	Labor day
05	Wed Sep 04	Probability
06	Mon Sep 09	Probability
07	Wed Sep 11	Calculus
08	Mon Sep 16	Calculus
09	Wed Sep 18	Analysis
10	Mon Sep 23	Design
11	Wed Sep 25	Design
12	Mon Sep 30	Design
13	Wed Oct 02	Test 1: math
14	Mon Oct 07	Training
15	Wed Oct 09	Training
16	Mon Oct 14	Implementation
17	Wed Oct 16	Implementation
18	Mon Oct 21	Implementation
19	Wed Oct 23	Vision
20	Mon Oct 28	Vision
21	Wed Oct 30	Test 2: networks
22	Mon Nov 04	Language
23	Wed Nov 06	Language
24	Mon Nov 11	Speech
25	Wed Nov 13	Speech
26	Mon Nov 18	Games
27	Wed Nov 20	Games
00	Mon Nov 25	Fall break
00	Wed Nov 27	Fall break

28 Mon Dec 02 Summary
29 Wed Dec 04 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