Syllabus (Current)

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0 Outline

1 Logistics

Class:	CS 6301.502.18F Special Topics in Computer Science – Convolutional Neural Networks
Link:	https://coursebook.utdallas.edu/search/searchresults/cs6301.502.18f
Location:	Mon and Wed from 5:30 – 6:45 pm in FN 2.102
Office hrs:	TBA
TA:	TBA

2 Description

Description: This course provides an introduction to convolutional neural networks (CNNs). The theory part of the course is motivated by the realization that many information extraction problems can be reduced to a classification or regression problem, neural networks are universal approximators and CNNs are an efficient neural network structure for multidimensional data. Network design and training methods are discussed along with software and hardware requirements for high performance CNN implementations. Theory and implementation are demonstrated and expanded on in the context of applications.

Outline:	Background	– linear algebra, calculus, probability
	Theory	– machine learning, convolutional neural networks
	Implementation	– hardware, software

Application – vision, speech, language, games

Objectives: Course learning objectives include:

1. Ability to understand, design and train convolutional neural networks
2. Ability to create software for mapping convolutional neural network designs to hardware
3. Ability to specify hardware for convolutional neural network optimized data movement and compute
4. Ability to evaluate convolutional neural network performance
5. Ability to apply convolutional neural networks to applications including vision, speech, language and games

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

3 Plan

01	Mon Aug 20	Introduction		
02	Wed Aug 22	Linear algebra		
03	Mon Aug 27	Linear algebra	HW1 assigned	
04	Wed Aug 29	Calculus		
00	Mon Sep 03	Labor Day		
05	Wed Sep 05	Calculus	HW2 assigned	HW1 due
06	Mon Sep 10	Probability		
07	Wed Sep 12	Probability		
08	Mon Sep 17	Algorithms / design	HW3 assigned	HW2 due
09	Wed Sep 19	Design		
10	Mon Sep 24	Design		HW3 due
11	Wed Sep 26	Theory test review		
12	Mon Oct 01	Theory test		
13	Wed Oct 03	Design	HW4 assigned	
14	Mon Oct 08	Training		
15	Wed Oct 10	Training	HW5 assigned	HW4 due
16	Mon Oct 15	Training		
17	Wed Oct 17	Project discussion	HW6 assigned	HW5 due
18	Mon Oct 22	Training / implementation		
19	Wed Oct 24	Implementation	Tool assigned	HW6 due
20	Mon Oct 29	Implementation		
21	Wed Oct 31	Implementation		Project proposal due
22	Mon Nov 05	Vision		
23	Wed Nov 07	Vision		
24	Mon Nov 12	Speech		
25	Wed Nov 14	Speech		Tool due

00	Mon Nov 19	Fall break	
00	Wed Nov 21	Fall break	
26	Mon Nov 26	Language	
27	Wed Nov 28	Games	
28	Mon Dec 03	Art	Project slides due
29	Wed Dec 05	Project presentations	
00	Mon Dec 10	Reading day	

4 Grades

25% Theory test
25% Implementation tool
25% Project
25% Homework

No final exam