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 ECSN 2.110
Office hrs: TBA
TA: TBA

2 Description

Description: This course provides an introduction to convolutional neural networks (CNNs). 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: Math   – linear algebra, calculus, probability and algorithms
            Networks   – design, training and implementation

Applications   –   vision, speech, language, games and art

Objectives: Course learning objectives include:

1. Ability to design convolutional neural networks
2. Ability to train convolutional neural networks
3. Ability to implement convolutional neural networks
4. Ability to apply convolutional neural networks to applications including vision, speech, language, games and art

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

3 Plan

01	Mon Jan 14	Introduction	HW1 assigned	
02	Wed Jan 16	Introduction		
03	Mon Jan 21	Martin Luther King Jr day		
03	Wed Jan 23	Linear algebra	HW2 assigned	HW1 due
04	Mon Jan 28	Linear algebra		
05	Wed Jan 30	Linear algebra		
06	Mon Feb 04	Calculus	HW3 assigned	HW2 due
07	Wed Feb 06	Calculus		
08	Mon Feb 11	Probability	HW4+5 assigned	HW3 due
09	Wed Feb 13	Probability		
10	Mon Feb 18	Algorithms		HW4+5 due
11	Wed Feb 20	Design		
12	Mon Feb 25	Design	HW6 assigned	
13	Wed Feb 27	Test 1: math		
14	Mon Mar 04	Design		
15	Wed Mar 06	Training	HW7 assigned	HW6 due
16	Mon Mar 11	Training		
17	Wed Mar 13	Implementation		HW7 due
00	Mon Mar 18	Spring break		
00	Wed Mar 20	Spring break		
18	Mon Mar 25	Implementation	HW8 assigned	
19	Wed Mar 27	Vision		
20	Mon Apr 01	Vision	HW9 assigned	HW8 due
21	Wed Apr 03	Test 2: networks		
22	Mon Apr 08	Speech		HW9 due
23	Wed Apr 10	Speech	HW10 assigned	
24	Mon Apr 15	Language		
25	Wed Apr 17	Language	HW11 assigned	HW10 due

26	Mon Apr 22	Games		
27	Wed Apr 24	Art	HW12 assigned	HW11 due
28	Mon Apr 29	Summary		
29	Wed May 01	Test 3: applications		HW12 due

4 Grades

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

No final exam