

Syllabus

Arthur J. Redfern

arthur.redfern@utdallas.edu

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0 Outline

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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	Algorithms		
10 Mon Feb 18	Design		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	Training		
15 Wed Mar 06	Training	HW7 assigned	HW6 due
16 Mon Mar 11	Implementation		
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