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 from Jan 13 – Mar 11
	Mon and Wed from 5:30 – 6:45 pm online from Mar 30 – Apr 29
Office hrs:	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

The original class plan is updated as indicated below for the time period from Mar 23 – Apr 29 due to the extra week of Spring Break and the shift to online classes for the remainder of the semester.

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
00 Mon Mar 23   Spring Break
00 Wed Mar 25   Spring Break
18 Mon Mar 30   Implementation   Project 2: networks (assigned)
19 Wed Apr 01   Vision
20 Mon Apr 06   Vision   Project 2: networks (due)
21 Wed Apr 08   Language

22 Mon Apr 13   Language
23 Wed Apr 15   Speech   Project 3: applications (assigned)
24 Mon Apr 20   Speech
25 Wed Apr 22   Games
26 Mon Apr 27   Games
27 Wed Apr 29   Summary   Project 3: applications (due)

4 Grades

The original grade plan is updated as indicated below for Project 2 and Project 3 due to the extra week of Spring Break and the shift to online classes for the remainder of the semester.

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

No final exam