Syllabus

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1 Logistics

Class:	CS 6301.502.20F Special Topics in Computer Science – Convolutional Neural Networks
Location:	Mon and Wed from 5:30 – 6:45 pm online + recordings
Office hours:	TBA online
Course material:	https://github.com/arthurredfern/UT-Dallas-CS-6301-CNNs

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

01	Mon Aug 17	Introduction
02	Wed Aug 19	Linear algebra
03	Mon Aug 24	Linear algebra
04	Wed Aug 26	Algorithms
05	Mon Aug 31	Probability
06	Wed Sep 02	Probability
00	Mon Sep 07	Labor Day
07	Wed Sep 09	Calculus
08	Mon Sep 14	Calculus
09	Wed Sep 16	Analysis
10	Mon Sep 21	Project 1 due: math
11	Wed Sep 23	Design
12	Mon Sep 28	Design
13	Wed Sep 30	Design
14	Mon Oct 05	Training
15	Wed Oct 07	Training
16	Mon Oct 12	Training
17	Wed Oct 14	Implementation
18	Mon Oct 19	Implementation
19	Wed Oct 21	Vision
20	Mon Oct 26	Project 2 due: networks
21	Wed Oct 28	Vision
22	Mon Nov 02	Vision
23	Wed Nov 04	Language
24	Mon Nov 09	Language
25	Wed Nov 11	Speech
26	Mon Nov 16	Speech
27	Wed Nov 18	Games
28	Mon Nov 23	Games
29	Wed Nov 25	Summary
00	Mon Nov 30	Reading day
30	Wed Dec 02	Project 3 due: applications

4 Grades

25%	Project 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	