CSE 676: Deep Learning
Projects for Fall 2018

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1   Project Goals

Students will be expected to develop two projects for this course. Both projects relating to Deep Learning.

Each project will be performed by a team of up to three students. Implementations of the projects are to be done using Python. You can use Tensorflow or other packages for the implementation.

1.1   Project 1

1.1.1   Problem Domain

Determine a *topic* and a *task* that relates to the first half of the course: Deep Networks: Modern Practice (Chapters 6-12 as given in `http://www.cedar.buffalo.edu/~srihari/CSE676`). Note that these topics correspond to Lectures 3-9 as described in UB Learns → Course Documents.

For instance your topic could be *Chapter 9:Practical Methodology: Performance Metrics* and the task would be to study different evaluation metrics such as accuracy and precision/recall on unbalanced data sets. The study would be performed on a classification task for recognizing whether people are wearing glasses or not. The classification task would be performed using a publicly available dataset.

1.1.2   Proposal Quad-Chart

Prepare a quad-chart for your project proposal. The quad-chart consists of a single slide with four parts: (i) Title (with authors), Lecture Topic and Task title (ii) Task description and data set description (iii) Implementation methods (iv) Results expected. The quad-chart can be a single large Powerpoint slide. The quad-chart will be presented in the instructor's office about four weeks after classes begin.

1.1.3 Final Report

The format of the report is in the form of a paper as described further in Section 2.The final project report will be due October 15. The final project report will be presented in the instructor's office, together with the quad chart for the second project.

1.2 Project 2

1.2.1 Problem Domain

Determine a topic and task that relates to second half of the course: Deep Learning Research (Chapters 13-20). They correspond to Lectures 10-14 as described in UB Learns → Course Documents.

For instance your topic could be *Chapter 15: Representation Learning: Semisupervised Disentangling of Causal Factors* and the task would be to study how well the algorithms perform on a data set of human faces.

1.2.2 Proposal Quad-Chart

Prepare a quad-chart for your project, similar to that for Project 1. A single slide with four parts: (i) Title (with authors), Lecture Topic and Task title (ii) Task description and data set description (iii) Implementation methods (iv) Results expected. It will be presented in mid-October in the instructor's office.

1.2.3 Final Report

The project report will be due December 8. The format of the report will be as described in Section 2

2 Project Deliverables

There are two deliverables corresponding to each of the two projects: (i) project code and (ii) project report.

The reports should describe the problem domain, data set, algorithms used and performance (time complexity and accuracy). Use a format such as a conference paper for submission to NIPS or ICML. Include appropriate graphs and charts.