CSE 398/498: Deep Learning

Final Course Project

In the final course project, you will develop and implement a deep learning framework for a specific application of interest. Like in HW3, you can use one of the deep learning libraries (TensorFlow, PyTorch, or Caffe2) to assist with your implementation. You could also explore the Neural Network Toolbox provided by Matlab.

Requirements

You can build your final course project on top of your implementation for HW3. There is one additional requirement, however. That is, you are required to construct your own, new network architecture. In HW3, it was acceptable if you used transfer learning to fine tune a pretrained network to learn a new task. For the final course project, you should create a new network architecture or change an existing architecture to add new layers, try new activation functions, use a different cost/objective function, etc. Then, experiments should be designed to evaluate the performance of your new framework.

The types of deep learning frameworks that you can use in your final course project are extended to include Generative Adversarial Networks (GANs) and deep reinforcement learning frameworks, in addition to Multi-layer NN, ConvNet, RNN or LSTM.

Project Timeline

1. **Proposal** (2 pages)

   Due electronically: Monday, November 27th

2. **Software Demo, Project Presentation** (5~7 minutes)

   Software demo due electronically: Monday, December 4th 11:59PM
   Project presentations: Last week of classes, Dec. 5 & Dec. 7

3. **Project Report** (4 pages)

   Due electronically: Monday Dec. 11th, 11:59PM

Project Description

The final course project consists of four components:

1. Project development and proposal (20%)
   - Literature review

- Programming environment
- Dataset
- Expected results

2. Demo software (30%)
    - Source code implementing algorithms
    - User's manual
    - Performance evaluation (contributions, limitations, potential improvements)

3. Final Course Project Presentation (20%)
    - The project presentation should include, as much as possible:
        - Introduction & Background
        - Methodology
        - Implementation and Experimental Results
        - Demo of implementation and program
        - Conclusion and Discussion
    - The presentation should be made for 5~7 minutes

4. Project report (30%)
    - The report should have the following sections:
        1) Introduction
        2) Background (or Literature Review)
        3) Methodology
        4) Implementation and Experimental Results
        5) Conclusion and Discussion

Please turn in your proposal, software demo, power point presentation, and project report via Course Site.