CSE4/510: Applied Deep Learning
Summer 2020

Instructor: Alina Vereshchaka

Final Project

Multiple deadlines, please see below

Description

The goal of the Final Project is to explore advanced methods and/or applications in deep learning. You will be expected to prepare a proposal, checkpoint, code, and presentation. The project must involve deep learning algorithms. You are encouraged to use your ongoing research work as a project in this course or extend any of the course projects. You may discuss the topic of your final project with course staff by private message in Piazza, or in office hours. If you are not sure about the topic, we encourage you to speak with us.

Directions:

Below is a list of possible directions for your final project, you need to choose one.

- **Deploy deep learning models as a web application**
  E.g. gitHub: https://github.com/nathanmargaglio/Deployable-Model
- **Build and train state-of-the-art CNN or RNN architecture on ImageNet**
  - Build any state-of-the-art architecture from scratch (e.g. ResNet, VGG, InceptionNet with any configurations).
  - Discuss the architecture you choose and provide the results.
  - Compare the results with a vanilla neural network and some shallow network, e.g. AlexNet
- **Build RNN model for NLP problem**
- **State-of-the-art CNN model + Reinforcement Learning**

    - Implement deep reinforcement learning algorith with CNN as a feature extraction for screens preprocessing
    - Your environment should include image processing (e.g. Atari)
    - Provide the results of using a shallow network vs. advanced CCN model on the same reinforcement learning model setup.

- **Recommender system**

- **Propose you own topic**
  You may also come with your topic proposal. Please talk to us.

Registering your team

Deadline: June 24

You can work individually or in a team of up to 3 people.
Register your team here -- https://forms.gle/2xYsceHqjxt6GyL66

Writing the proposal

Deadline: June 26

The project proposal should be a one page single-spaced extended abstract motivating and outlining the project you plan to complete. You proposal should have the following structure:

1. Topic
2. Objective. Explain the objective of the project -- what you are trying to solve.
3. Technical Outline. Explain your approach at a high-level.
4. What algorithm and dataset you are planning to use.
5. List any reference you are planning to use.

Checkpoint

Deadline: August 2

Submit your initial results of your model (e.g. built baseline model and prepared a pipeline for training). You can submit just code, no report needed.

Present your work

Presentation Days: August 12, 1pm

Present your work during the Presentation Day. Registration slots will be available prior to dates. The whole team should present the work.

Note: your presentation should represent the work you will submit.

Presentation details

Length: 10 mins + followup questions

Presentation Templates: UB branded ppt templates or UB CSE PowerPoint template

Suggested presentation structure:

- Project Title / Team's Name / Course / Date [1 slide]
- Project Description [1 slide]
- Background [max 2 slides]
- Implementation [max 2 pages]
- Demo (if available)
- Results (Graphs & Any Visuals) [max 4 slides]
- Key Observations / Summary [1 slide]
- Thank you Page [1 slide]

Submit the Final Project

- Submit at **UBLearns > Assignments**
- The code of your implementations should be written in Python. You can submit multiple files, but they all need to have a clear name.
- All project files should be packed in a ZIP file named **TEAMMATE#1_UBIT_TEAMMATE#2_UBIT_final_project.zip** (e.g. **avereshc_neelamra_final_project.zip**).
- Your Jupyter notebook should be saved with the results. If you are submitting python scripts, after extracting the ZIP file and executing command python

main.py in the first level directory, all the generated results and plots you used in your report should appear printed out in a clear manner.

- A report can be combined with the presentation. Thus if you discuss all the technical implementation of your project and provide the results, a separate report is not necessary.
- Include all the references that have been used to complete the project.

Important Information

This project can be done in a team of up to three people. The standing policy of the Department is that all students involved in an academic integrity violation (e.g. plagiarism in any way, shape, or form) will receive an F grade for the course. Refer to the Academic Integrity website for more information.

Late Days Policy

For the final project each team is eligible with a special 3 late days per team, no matter whether you are working individually or with teammates. These late days can be applied to only final projects related due dates. Be aware that some of the parts have hard deadlines. These cannot be combined with your individual late days. You don't have to inform the instructor, the late submission will be tracked in UBlearns.

Important Dates

July 24, 11:59pm - Register your team (https://forms.gle/2xYsceHqjxt6GyL66)

July 26, 11:59pm - Abstract is Due

August 2, 11:59pm - Checkpoint is Due

August 12, 1:00pm - Presentation (hard deadline, no late days can be applied)

August 12, 11:59pm - Final Submission Deadline