Final Project

Overview

The project in our course has a great importance as it provides you with the opportunity to have hands-on experience with deep neural networks and conduct a small research by yourselves. It may involve covering uncovered fields by a paper, suggesting an improvement, applying on different scenarios, etc.
The project include a proposal approval, report + code submission, and an oral (10 minutes) or poster presentation. Both oral and poster presentations will take place at the project day of the course on **01/03/2021**. Attendance is mandatory for the whole day. Points will be reduced for attending only part of it.

Papers

The first thing you need to do is to find a relevant paper of interest. To inspire ideas, you might also look at recent deep learning publications from top-tier conferences and journals such as

- CVPR: IEEE Conference on Computer Vision and Pattern Recognition
- ICCV: International Conference on Computer Vision
- ECCV: European Conference on Computer Vision
- NIPS: Neural Information Processing Systems
- ICLR: International Conference on Learning Representations
- ICML: International Conference on Machine Learning

Project Proposal

The project proposal should be one paragraph. Your project proposal should include:

a. Both students IDs, names, and mail addresses.

b. What paper/papers did you choose?

c. What is the problem that you will be investigating? Why is it interesting?

d. What data will you use?

e. What method/model will you use? Are there any existing implementations? If so, in which libraries are they written?

f. How will you evaluate the results?

g. What will be the innovation in your project? Though this may change while doing the project, it is important to have a goal from the beginning

Submit your proposal as a PDF file by moodle. To support "early birds" and "late" ones, there will be three dates for submission, as summarized at

"Important Dates" section. After (and only after) each date, the proposals will be reviewed and approved. Feel free to contact the course staff for advising, at any time.

Report

Your final report should be around 10 pages long, and structured like a paper (in English). Latex/lyx is recommended but not obligatory.

The following is a suggested structure for your report, as well as the rubric that we will follow when evaluating reports. You do not necessarily have to organize your report using these sections in this order, but that would likely be a good starting point for most projects.

- **Title, Author(s), ids, e-mails.**
- **Abstract**: Briefly describe your problem, approach, and key results. Should be no more than 300 words.
- **Introduction (10%)**: Describe the problem you are working on, why it's important, and an overview of your results
- **Related Work (10%)**: Discuss published work that relates to your project. How is your approach similar or different from others?
- **Data (5%)**: Describe the data you are working with for your project. What type of data is it? Where did it come from? How much data are you working with? Did you have to do any preprocessing, filtering, or other special treatment to use this data in your project?
- **Methods (25%)**: Discuss your approach for solving the problems that you set up in the introduction. Why is your approach the right thing to do? Did you consider alternative approaches? You should demonstrate that you have applied ideas and skills built up during the quarter to tackling your problem of choice. It may be helpful to include figures, diagrams, or tables to describe your method or compare it with other methods.
- **Experiments (20%)**: Discuss the experiments that you performed to demonstrate that your approach solves the problem. The exact experiments will vary depending on the project, but you might compare with previously published methods, perform an ablation study to determine the impact of various components of your system, experiment with different hyperparameters or architectural choices, use visualization techniques to gain insight into how your model works, discuss common failure modes of your model, etc. You should include graphs, tables, or other figures to illustrate your experimental results.
- **Conclusion (5%)** Summarize your key results - what have you learned? Suggest ideas for future extensions or new applications of your ideas.
- **Writing / Formatting (5%)** Is your paper clearly written and nicely formatted?
- **Appendix (20%)** should include at least all the coding you have done. As known, most papers have a github with relevant code. To gain the full points, you should either apply a big change to the code with your

improvements, or convert it to a different library (from tensorflow to PyTorch or vise versa). Be sure to mention all links to the code parts you have collected online.

Presentation Day

Scheduled for **01/03/2021, 8:00-20:00**. Further details will be posted near the event. You should make a 10 minutes presentation or poster of your work. **Important**: taking part in only part of the day, will cause point deduction.

Submission

You should submit a single PDF file with the report to moodle. Additionally, share a folder named "project_123456789_123456789" with barakhadad@mail.tau.ac.il, similarly as the exercises. It should include a readme file and all other code related files. Both requirements should be fulfilled by the due date specified.

Final remarks

Sounds like a lot of work? Its not! Start and you will see for yourself.

One last thing: Do not be afraid, and do not be intimidated by the papers you read. Even if they appear as hard at the beginning, after several rounds of reading, everything typically becomes much clearer. If this is not the case, it is most likely that it is because of poor writing by the authors. Keep in mind that in most cases, the person who wrote the paper is not different or more capable compared to you.

Important Dates

- Proposal submission – first date: **15/11/2020 at 23:55**
- Proposal submission – second date: **13/12/2020 at 23:55**
- Proposal submission – last date: **27/12/2020 at 23:55**
- Project submission: **28/02/2021 at 23:55**
- Project day: **01/03/2021**

Project examples

The required project is quite similar (though not exactly the same) to the one at:

http://cs231n.stanford.edu/project.html

This website has many report examples, which you may look at for inspiration.

Good luck!