

Mini Project (Optional)

CS-541: Artificial Intelligence

Spring 2022

Note: This project is optional and can be used to get a bonus of 10% of the overall grade. Those who opt out of this project will not get any negative effect on their grades.

1 Project

You should pick a peer-reviewed paper which also shares their code and try to reproduce the results. The paper should be using a neural network and applying it to any AI/ML task. Some things to consider for the paper selection include.

- The paper should use a neural network-based approach to solving a problem
- A source code should be provided by the authors
- The paper should not be published before 2015
- The paper should be published in a peer-reviewed conference, e.g. IEEE, ICML, NeurIPS, AAAI, ICLR, EMNLP, ACL, COLING, CVPR, ICCV etc.

Very Important! Before selecting the paper, you should consider the hardware requirements, time taken by the experiments, and the data size (whether it is too big for you to run). You should not pick a paper which you later found requires much larger GPU memory or much more time to run.

2 Deadlines

Those who opt to work on the project need to submit weekly deliverable (by 11:59pm of the date specified). The deadlines for these are fixed and **no extension or late submission** will be accepted. A missed deadline means you will lose partial marks for the project. Each of the deadline **does not** have equal weight in the final score.

No.	Deliverable	Deadline
1	Project Proposal	(Wed) 13th April 2020
2	Environment Setup	(Wed) 20th April 2020
3	Experiments & Results	(Wed) 27th April 2020
4	Final Report	(Wed) 4th May 2020

3 Written Document

You will create a written document (**pdf/docx**). The order of the document should be as below.

No.	Section
1	Title
2	Abstract
3	Introduction
4	Method
5	Data
6	Tools & Technologies
7	Experiments
8	Results
9	Problems/Issues
10	Conclusion

For each deliverable, you will be adding or updating one of the sections mentioned above. The requirements for each of the deliverable are given in the next sections.

3.1 Project Proposal - 13th April

Your first deliverable will be a written document describing the project. It should include the following:

- **Title:** The paper title and your name, course name and Stevens email ID.
- **Abstract:** A short paragraph giving an overview of the paper including the problem, how the authors tried to solve it and the improvement they observed.
- **Github link (in abstract):** The abstract should include the github link where you will put all the code.
- **Data:** A paragraph describing the details of the data including the size of the train, validation and test datasets as well as the the link to the data.

3.2 Environment Setup - 20th April

Update the written document from the first deliverable with the following sections added or updated.

- **Tools & Technologies:** The details of the software/library packages (including the links) and hardware requirements (personal GPU or Colab etc).
- **Data:** Add the pre-processing details to the section ‘Data’.
- **Experiments:** A paragraph describing the details of the baseline experiment. This may include the training details (epochs, learning rate, dropout etc.) and the network architecture.
- **Results:** You should include some preliminary results or update section ‘Problems/Issues’ below.
- **Problems/Issues:** This should include the details and issues when setting up the library/packages for the experiments. If no initial results are mentioned in the section ‘Results’, you should mention reasons why you were not able to obtain any results.

3.3 Experiments & Results - 27th April

Update the written document from the second deliverable with the following sections added or updated.

- **Method:** A paragraph describing the paper’s method.
- **Problems/Issues:** You should update the section ‘Problems/Issues’ and describe how you were able to resolve the problems faced during setting up the code.
- **Experiments:** Add the training details of the paper’s method (if different from baseline) to the section ‘Experiments’. You should also include training details like training time or memory usage etc. You should also include the details of the evaluation method you used.
- **Results:** Details of the results for the baseline and the paper’s method. You should include the results with parameter tuning (if in the original paper). The main results should be mentioned in a table and any parameter tuning results should have a plot.

3.4 Final Report - 4th May

Finalize the written document including fixing any typos/grammatical issues etc. The written document should include the following.

- **Abstract:** Updated the section ‘Abstract’ including the results you obtained.

- **Introduction:** It should give an overview of the overall project. You should discuss the problem you tried to solve, the method you used, the data used and the results you obtained, and (if any) problems including the setup or the final results being different from what paper reported.
- **Problems/Issues:** You should update the section ‘Problems/Issues’ and discuss the difference in the results you obtained compared to the original paper.
- **Conclusion:** A paragraph giving the summary of the report.

Readme (for Github Repo): Apart from the report, the github repository should include a step by step guide to reproduce the results you obtained.

Submission

This is an individual project. Each person should submit a single pdf/docx file for each of the deliverable, named with deliverable number (e.g. *Proj2_akhan4.pdf*).

Remember that after general discussions with others, you are required to work out the problems by yourself. All submitted work must be your own, though you can get help with others, so long as you cite the help. Please refer to the Stevens Honor System for clarifications.