

Deep learning project (Due by noon 12pm on May 2)

1 Project report guidelines

The project report should read like a computer science conference or journal paper. A prototypical structure is shown below. These are just guidelines, feel free to adapt the structure to suit your project.

1. **Introduction and Motivation:** Motivate and abstractly describe the problem you are addressing and how you are addressing it. What is the problem? Why is it important? What is your approach and main contribution? A short discussion of how it fits into related work in the area is also desirable. Summarize the basic results and conclusions that you will present.
2. **Problem definition:** Describe in detail the problem. What are the inputs? What are the expected outputs? Elaborate on why this is an interesting and important problem. Use illustrative examples to support your description.
3. **Approach:** Describe in detail the ML approach you used to solve the problem. It is highly recommended that you illustrate how your model is intended to work by showing step by step how it runs on an illustrative example. The example should be complex enough to illustrate all of the important aspects of the problem but simple enough to be easily understood. Use graphical figures to show architectures or processing pipelines. Alternative names for this section could be **Model**, **Algorithm**, **Model Architecture**, **System Architecture**, or you can use a more concrete, concise description of the model as the section title, e.g. *Recurrent Capsule Architecture*.
4. **Dataset:** Describe the data used in the experiments. This is especially important if you plan to run an existing ML model on a new dataset. Make sure you include useful statistics, such as number of samples, number of inputs in a sample, how it was annotated with labels.
5. **Experimental Evaluation:**
 - (a) **Methodology or Experimental Setting:** What are criteria you are using to evaluate your method? What specific **hypotheses** does your experiment test? What is the training/test data that was used? What performance evaluation measures are you using? What is the **baseline**? If there are hyperparameters, how were they tuned? Comparisons to baselines and existing methods that address the same problem are particularly useful.
 - (b) **Results:** Present the quantitative results of your experiments. Graphical data presentation such as graphs and histograms are frequently better than tables. What are the basic differences revealed in the data. Are they statistically significant?
 - (c) **Discussion:** Is your hypothesis supported? What conclusions can you draw, in particular what do the results say about the strengths and weaknesses of your method compared to other methods? How can the results be explained in terms of the underlying properties of the algorithm and/or the data.

6. **Related Work:** Describe related work and relate it to your work, e.g. how your approach is different from previous work.
7. **Future Work:** Ideas for improving the approach can be listed here.
8. **Conclusion:** Briefly summarize the contribution and important results. What are the key points illustrated by your work?
9. **Bibliography:** Be sure to include a standard, well-formatted, comprehensive bibliography with citations from the text referring to previously published papers in the scientific literature that you utilized or are related to your work.

2 Submission

Electronically submit on Blackboard a `project.zip` file that contains a `project` folder organized as follows:

```
dl6890/  
  project/  
    README.txt  
    code/  
    data/  
    report/  
      report.pdf
```

You can include other folders and files in this structure as you see fit. In the `README.txt` file explain how your code is supposed to be run on a Linux machine (e.g. `california.cs.ohio.edu`). If the dataset is big, do not submit it on Blackboard, instead include a link to the dataset in the `README.txt` file. **Make sure that the report is saved as a PDF.** Do not submit external packages, such as PyTorch, on Blackboard. Do not submit temporary files.

On a Linux system, creating the archive can be done using the command:

```
> zip -r project.zip project.
```

Please observe the following:

1. Structure, indent, and format your code well.
2. Use adequate comments, both block and in-line to document your code.
3. Make sure your code runs correctly when used in the directory structure shown above.