Machine Learning Practical 2022/23 Coursework 4

Project Final Report

Due date: 12:00 Friday 24 March 2023

Maximum report length: 8 pages + references

This coursework is the final report of the project that you have done in your project group of 2–3 students.

Report Content

Each group's Final Report should cover the following issues:

- Abstract
- Introduction
- Task and data
- Methodology
- Experiments
- Related work
- Conclusions

Introduction: This should outline the research questions you investigated and the objectives. If the objectives changed since the interim report, please point this out and explain why. (For instance, maybe your initial experiments justified a change of plan in some way.) In this section you should make clear what the project's contribution is: how is it different to what is already done. The contribution of a project should extend what has already been done. Perhaps it will be a more detailed investigation of some particular aspects of a model/algorithm on a particular dataset; perhaps you will be looking at an approach not previously reported on a particular dataset, etc. Your project should involve more than using existing code and running it without modification.

Task and dataset: Clearly describe the data set and task you will be exploring. If the data requires any preprocessing, then explain this. The description should be in enough detail such that your work would be reproducible by another group. Describe how you will evaluate the task (for example, classification accuracy). Every decision you make in your report would ideally be supported. E.g., if something is standard practice in the literature, and that is why you are also doing it, then state this and provide evidence for it. Presenting alternatives, especially if those are more typical of the literature, and contrasting those with your choice is also a valid contribution. Use citations where appropriate.

Methodology: Explain clearly the technical methodology, the models and algorithms that are used. Approaches that were covered in the lectures can be described briefly, but if you are using modifications to such approaches make sure these are clearly described. Again use citations to the literature. Avoid pasting or paraphrasing the methodology directly from the cited work. Instead consider why you are using these approaches, and how they can best be presented in the context of your work. Keep examples consistent with your domain, and notation consistent with your paper. Consider also how you might have adapted the approaches to work in your case.

Experiments: This section should cover the experiments carried out, including, for each experiment:

- Motivation – what did you aim to learn from the experiment?

- Description – describe carefully how you carried out the experiment, mentioning and justifying the hyperparameter settings. As always, your aim is to give enough information so that someone else (e.g. another MLP group) could reproduce the experiment precisely.
- Results – present the results clearly and concisely. Usually a result is in comparison to a result from another approach (e.g. a baseline experiment, the previous experiment, results from the literature, ...), please make sure that these comparisons are clearly presented.
- Interpretation and discussion – what do your results indicate? how do they relate to the motivation for the experiment? are there further useful analyses or visualisations of the results that you can carry out?

Related work: This section should review published work which can help to give a better understanding of your work – related approaches, other work on the same data, ideas for future work. The aim is to try to place what you have done in a wider context.

Conclusions: The conclusions section should concisely summarise what you have learned from the experiments you carried out, and relate the final outcome of the project to the overall research questions and objectives.

Please note that negative results are not necessarily a bad thing – learning is always good! But negative or positive, please try to analyse your results as well as you can.

Report Details

A single final report should be submitted for each group. The report should show the project group number (e.g. G001) and the student matriculation numbers of the team members.

Format and length: Use the same document style for the final report as for the interim report (and courseworks 1 and 2). The final report should be a maximum of **8 pages** long, not including references. We will not read or assess any parts of the report beyond the allowed 8 pages + references.

Citations: If you make use of any any articles, books, web pages or other resources you should appropriately cite these in your report. You do not need to cite material from the course lecture slides or lab notebooks.

Marks: This assignment will be assessed out of 100 marks and forms 50% of your final grade for the course. The group is marked collectively, so each student in a group will receive the same mark. The marking guidelines are presented below (p. 3).

Academic conduct: Assessed work is subject to University regulations on academic conduct:
http://web.inf.ed.ac.uk/infweb/admin/policies/academic-misconduct

Submission: You can submit more than once up until the submission deadline. All submissions are timestamped automatically. Identically named files will overwrite earlier submitted versions, so we will mark the latest submission that is submitted up to 7 days after the deadline. **Please let the course organizers know, if you already submitted the coursework and you plan to resubmit it in the extension period so that we do not mark your previous submission.**

Late penalty: Reports submitted after the deadline will be recorded as late and will be penalised as follows:

> *Following the University guidelines, late coursework submitted without an authorised extension will be recorded as late and the following penalties will apply: 5 percentage points will be deducted for every calendar day or part thereof it is late, up to a maximum of 7 calendar days. After this time a mark of zero will be recorded.*

Warning: The late penalty will be based on the timestamp of the latest submitted report. Thus if you submit before the deadline, then make a submission after the deadline you will be subject to a late penalty.

Extension requests: For information about extension requests (and additional information about late penalties), see http://web.inf.ed.ac.uk/infweb/student-services/ito/admin/coursework-projects/late-coursework-extension-requests

Course instructors cannot give extensions. Therefore please do not contact any course staff directly about extension requests; you must follow the instructions on the web page.

Public github: If you would like to share your source code, scripts, and any demo on a public github then that is encouraged. Please note that this is a specific policy for the MLP group project, and for other courses you need to check with the course instructors. In particular, since all groups are doing different projects in MLP it is permitted to share things on a public github before the final submission of the coursework.

Submission

Your coursework submission should be done online on the Learn course webpage.

Each group should nominate one team member to make the submission for the group. Multiple submissions of the report are not required. Please make sure that your report includes the student ID numbers of the team members, as well as your project group ID (e.g. G456).

Your submission should include

- your completed interim report as a PDF file, using the provided template.
- your implementation code files and notebooks that have been use to generate results discussed in the report.

Please make sure the code source folder does not include any log files, data or model weights.

You should copy this pdf file and the code source folder to a single directory, `coursework4-<groupID>`, e.g.

```
mkdir coursework4-<groupID>
cp -a interimReport-<groupID>.pdf <groupID>_source_code/ coursework4-<groupID>
```

(where `<groupID>` corresponds to your project group ID e.g. `G123`)

Please make sure your submitted directory is named `coursework4-<groupID>` and `<groupID>` consists of 4 characters (uppercase `G` followed by three digits).

You should then zip this directory as `<groupID>.zip` by using the following command in Linux/DICE:

```
zip -r <groupID>.zip coursework4-<groupID>/
```

Once you have successfully created the .zip file, you need to login to your Learn `Machine Learning Practical (2022-2023)[YR]` webpage and submit the file.

- Migrate to the section **Coursework** on the left column on the course page.
- Click on Coursework 4.
- A page will appear where you will need to browse and upload your .zip file that you created previously in `Attach Files` and then click **Submit**.

You can amend an existing submission by attaching a different .zip file using the Attach Files option and then Submit again.

Note that we will only mark the last uploaded coursework in case you amend your files. Thus it is your responsibility to make sure that correct files are uploaded.

Marking Guideline

- Abstract and Introduction – Is the abstract clear, and does it concisely cover what is reported in the document? Does the introduction clearly outline and motivate the paper? Are the research questions and objectives clearly presented, verifiable by experiments and worth conducting research on?
- Task and data – is the data set used clearly described? Is the task clear, and is the evaluation metric well-explained? Are there appropriate references for the task and data set, and for the evaluation approach?
- Methodology – Are the methodology and technical approaches adopted clearly described in a self-contained way, with appropriate references to the literature?
- Experiments – Is each experiment well-explained – including the motivation, technical description (reproducibility), the results (clearly presented), and the interpretation and discussion (relating to the motivation, research goals)?
- Related work and Conclusions – is the work reported in the paper put in context with references to the literature where appropriate? how does the work done match to the objectives? are the conclusions clearly expressed? what was learned from these experiments? are there any potential future research direction that is unexplored in the report?

To re-emphasise some of the key points: your report should be clearly written and presented, well-motivated and well-structured, making good use of citations to the literature, and enabling your experiments to be reproduced.

There marks allocation for each part **is not** fixed, as different projects may have different emphases which needs to be reflected in their marking. As an *indicative* guideline, and as a starting point, you could think in terms of the following marks breakdown: Abstract and Introduction (10%); Task and data (10%); Methodology (30%); Experiments (35%); Related work and conclusions (15%).