Assignment 3 - Deliver

Due 21st January 2025

OVERVIEW AND GOALS

In this third and final exercise your task is to demonstrate what you have achieved in the previous few months. You will do this in three different forms:

- Build a small demo application that runs your trained model and performs inference
- Write the final report of your project
- Prepare a presentation that we'll watch together in class

DELIVERABLES

Demo Application

Even the best scientific research is worthless if you can't share your knowledge and communicate your results. Therefore, you are asked to build a small demo application that a potential user could run to understand what you have done. There are many ways how you can realize this. In its simplest form, it is a command-line tool that takes the user input and produces a file as a result. A more sophisticated way would be to have a docker container that wraps such a command-line tool and could be deployed to a server for others to use. But depending on your project, a completely different form might be appropriate.

A great way to build a sample application is to develop a simple JavaScript web application that runs your trained model in the browser and provides a minimal interface to trigger inference. Some tools for doing this are ONNX.js, Tensorflow.js, Streamlit, Gradio, Anvil, Dash, and ConvNet.js. You can upload your trained models to Github (as an attachment to a release - don't commit it into the repository!) and dynamically fetch them when the user opens the webpage.

As a reference, you can play with the Deep Optical Measure Detector, which was developed for recognizing the structure (measures) in music scores. It is a Vue.js application and available on Github. For ONNX.js, there is also a range of publicly available demos that you can adapt.

Final Report

Your final report should contain a concise and informative written summary of your project. A large section of that report can be taken from your project proposal with appropriate edits. The entire report should be no longer than 5 pages.

It should answer the four fundamental questions:

- What is the problem that you tried to solve?
- Why is it a problem?
- What is your solution?
- Why is it a solution? (And in particular, why is or isn't deep learning a solution?)

Additionally, it should cover:

- The main take-aways and insights you gained from your project (e.g., batch-normalization improved the results significantly, Adadelta worked much better than SGD on my data, annotating data works really good with tool X, setting up the pre-processing takes much more time than I expected, ...)
- If you would do the same project again, what - if anything - would you do differently?
- How much time did you spend on your project? How does the number compare to your initial estimate? If you underestimated any part, what were the reasons for this?

The final report should be submitted as a single PDF file.

Presentation

Prepare and record a presentation that we will watch together in the last two lectures during class. The video must not be longer than four minutes. The first two minutes of that video should contain a quick introduction into your topic, the selected approach and the final results. The remaining two minutes should focus on insights that you want to share with your colleagues and ideally a small demo of the project.

Please record yourself giving the presentation in the best quality available, upload your presentation to YouTube, and send me the link. You can use free software like Davinci Resolve to edit your videos. The videos will not be made public, unless you want to. I will collect all the videos and create a playlist that we will watch together with one or two questions in between presentations. **Please don't flag the video as "specially made for children" or I won't be able to put it into a playlist.**

Please reserve the full 2 hours from 16:00 - 18:00 for the last two lectures. For fairness, all videos must be handed in before the first lecture and the actual presenters will be selected randomly.

Submission

Once you're done, please notify us by writing an e-mail to applied-deep-learning@outlook.com with the subject **[Applied Deep Learning] Exercise 3 - Your Matr.Number** and the final report as an attachment, as well as the link to your YouTube video.

CRITERIA FOR GRADING

As discussed in the preliminary lecture, every assignment will be graded according to these five criteria (as applicable):

- Results
- Creativity
- Complexity
- Code Quality
- Presentation

The demo application, the report, and the presentation are each worth up to 10 points.

Late Policy

Submissions will still be accepted after the deadline, but keep in mind that there is a penalty of one point per day. So if you submit your assignment two days late, you will only be able to achieve a maximum of 8 points.

Please note that the presentation (video) is exempt from this policy, as we watch the videos in class together. If your presentation is absent, it will receive 0 points.

OTHER QUESTIONS

In case you have other questions regarding the assignment, please send an e-mail to applied-deep-learning@outlook.com or post your question in the discussion forum in ILEA (preferred).