Final project instructions

Project Description

In your projects, you will use the ideas and techniques you learned in class in order to solve a new problem on your own.

First, choose a problem. Define and describe it, explain why it is not trivial and why it is interesting.

Second, implement two different ways to solve your problem. You are encouraged to go over course material and decide what chapters are relevant to your project. What are the assumptions on your problem's world? What algorithms best fits your needs? What algorithms has no chance of working on this setup? Implementation may use external libraries, code snippets or be based on your previous exercises, but you must properly reference all imported code fragments and cite the original authors.

Third, write a report. Measure your solutions' performances and present the results. Explain the differences between solutions and compare it with trivial bounds.

Forth, Present your work. Make a short story (a video presentation, about 6-8 minutes long) presenting your project to your colleagues. Try to separate the wheat from the chaff - supply motivation to your work and talk about the important details and results, but omit unimportant technicalities.

Fifth, Peer review. Ask a meaningful question on others' presentations. Exact matching and further instructions will be published after project submission.

Schedule

- **18.7** - submit your project proposal

- **15.9** - submit your project - code, report and video

- **22.9** - submit your peer review (individual asssignment)

Report structure

All projects **must** follow the same structure:

1. INTRODUCTION - **up to 500 words**. In this section you present your work - what is the problem at hand, why this is an interesting problem, how you planned to model and solve it (do not discuss results at this section)

2. PREVIOUS WORK - **up to 500 words**. In this section provide a succinct discussion of previous work - what algorithms were used to solve the problem, what are the current performance benchmarks? What are the common assumptions?

3. METHODOLOGY - **up to 1000 words**. In this section describe your model, the assumptions made, the success criteria (for example, in RL problems - the reward function). Make sure to be precise and rigours. Provide any information that you find necessary to evaluate the quality of your solution.

4. RESULTS - **up to 2000 words**. In this section describe the main findings - which models preformed better than others? what can you deduce from the results? provide evidence (plots, tables) to your findings and claims.

5. SUMMARY - **up to 700 words**. In this section you summarize your results. Reiterate over the problem, model and results, criticize (a bit) your work (what happnes if you revoke certain assumptions? what other methods may solve the problem too?).

Grading and evaluation

Grading is based on the following aspects:

1. Problem (5%): is your problem relevant to AI? is it a hard/interesting/new task? can it be solved easily or not?

2. Previous work (10%): did you review critical past work? have you bench-marked yourself against known/accepted baselines?

3. Model (25%): How did you model your problem? did you made all proper assumptions? Have you used abstraction/relaxation? if so - have you noted how this may affect the solution to the original problem? Can you generalize your model to other problems?

4. Solution (30%): Which algorithms/methods were used? which assumptions were made? Does the algorithms outperform a baseline? Are the results supported by more then one experiment? What evidence was provided to the quality of the solution? Can you generalize the solution? What is the sensitivity of the solution to the input?

5. Presentation (10%): The quality of the report - is it well written? is it easy to follow the story? does the visual aids contribute to the overall presentation? is it easy to replicate the results?

6. Code (15%): Is the code base accessible? can we replicate the code?

7. Peer review (5%): Could you ask **meaningful** questions about your colleagues works?

   Please note that these are guidelines for review and grading but the course staff reserves the right to modify them

Support and resources

We welcome you to use the forums and connect us about any problem/issue. Feel free to use other resources, but make sure you note this in your work - we have zero tolerance to academic plagiarism. If you use LLM's in your work (and you may!) - please note this in the introduction.

Good luck!