CS224n: Project Proposal Instructions

February 2019

Each team (both default and custom) hands in **one** project proposal, which is worth 5% of your grade. This document specifies what information you should include in your proposal – it applies to both default and custom projects.

Before you start writing your project proposal, make sure that you have watched the *Practical Tips for Final Projects* lecture and read through the corresponding lecture notes. The notes contain guidelines that will help you understand our expectations for projects, and enable you to write a better project proposal. If you're doing the default final project, you should also ensure you have read through the the default final project handout (posted on the website).

1 Key information to include

Your PDF proposal should have the following information at the top:

- **Title**: The title of your project (you can change this later).

- **Team member names**: List the names and @stanford.edu email addresses of all of your team members.

- **(Optional) External Collaborators**: If you have any collaborators who are not CS224n students, list them.

- **Custom or Default Project**: Indicate which you are doing.

- **(Custom project only) Mentor**: Note that we don't expect you to already have a mentor – you will be assigned one after we receive your proposal. Depending on your situation, write either (a) 'X has already agreed to be our mentor', (b) 'We would like to request X as our mentor', or (c) 'We have no particular mentor'. If you are doing one of the projects proposed by Stanford AI Lab members, write their name in case (a).

- **(Optional) Sharing Project**: If you are sharing this project between CS224n and another class, indicate it here.

2 Research paper summary (2 pages)

Paper selection: The first section of your proposal is a summary of a research paper that is relevant to your project. For example, if you are reimplementing a complex model, you should choose the paper that presents that model. If you are applying a particular method to a new task, you could choose the paper that presents the method. If you are developing a new variant of a particular model, you could choose the paper that presents the original model. There are other possible cases – use your judgment to choose what seems like the most relevant paper. If you are doing the default project, the papers linked in the default project handout are a great place to start.

Paper eligibility: Any research paper is fine, though you want to make sure it is a high-quality paper. For this, we encourage looking for papers that have been published in a peer-reviewed venue (i.e. conference or journal). However, due to the fast pace of Deep Learning and NLP research, there are many important and high quality papers that are not (or not yet) published at a peer-reviewed venue – for example, they may be very recent papers that have not yet been submitted for review. If you choose a paper that has not been published at a peer-reviewed venue, be wary that it might be unfinished or preliminary work.

The summary: Write a summary of the paper that a fellow CS224n student could understand. For most teams this will probably involve some key mathematical equations, but you don't have to exhaustively mathematically describe everything. You may include a diagram if you think it's important, but it shouldn't take up more than half a page. In your approximately 2-page summary, prioritize conveying the most important information and ideas of the paper. In particular, your summary should contain the following information (though you do not have to structure your summary in this order):

- **(Required)**: The title of the paper, list of authors, publication venue, publication year, and URL. Put this at the top of your summary.

- What does this paper set out to do? What does it achieve that is new or noteworthy?

- Why did you choose this paper?

- If this paper proposes a solution for a particular task, clearly state what the task is.

- If this paper uses a particular dataset (or datasets), clearly state which they are.

- If this paper uses a particular evaluation metric (or metrics), clearly state which they are. Also state any important scores that the work achieves on these metrics (you don't have to list every single score, but if there are some key numbers, mention them).

- If this paper has any important models or techniques, describe them.

- If you like, you can reference other papers – e.g. to compare methods, or to explain the contribution or impact of your chosen paper.

Not all of the above will apply to your project – use your judgment to determine which are important. In particular, if you're doing the default project, you do not need to spend time explaining things that are already covered in the default project handout (e.g. don't spend time explaining what SQuAD is, or what the F1 and EM metrics are).

In your summary, you should demonstrate that you fully understand the paper and how it fits into the wider research context (this may involve reading more than just the paper you're summarizing). You can even offer a critical opinion of the paper, though this is not required.

3   Project Description (1-2 pages)

In this section, you will describe what you plan to do for your project. It's fine if your project eventually evolves into something different – that's a natural part of research. But your proposal should lay out a sensible initial plan. This section should answer the following questions (it's a good idea to structure your project description in this way, but you can structure differently if you like):

1. *Describe the main goal(s) of your project.* If possible, try to phrase this in terms of a scientific question you are trying to answer – e.g., your goal may be to investigate whether a particular model or technique performs well at a certain task, or whether you can improve a particular model by adding some new variant, or (for theoretical/analytical projects), you might have some particular hypothesis that you seek to confirm or disprove. Otherwise, your goal may be simply to successfully implement a complex neural model, and show that it performs well on a given task. Briefly motivate why you chose this goal – why do you think it is important, interesting, challenging and/or likely to succeed? If you have any secondary or stretch goals (i.e. things you will do if you have time), please also describe them. In this section, you should also make it clear how your project relates to your chosen paper.

2. *What NLP task(s) will you address?* This could be the same task as addressed by your chosen paper, but it doesn't have to be. Describe the task clearly (i.e. give an example of an input and an output, if applicable) – though if you already did this in the paper summary, there's no need to repeat.

3. *What data will you use?* Specify the dataset(s) you will use (including its size), and describe any preprocessing you plan to do. If you plan to collect your own data, describe how you will do that and how long you expect it to take.

4. *What neural method(s) are you planning to use?* Describe the models and/or techniques you plan to use. If it's already described in the paper summary, no need to repeat. If you plan to explore a variant to a published method, focus on describing how your method will be different. Make it clear which parts you plan to implement yourself, and which parts you will download from elsewhere. If there is any part of your planned method that is original, make it clear.

5. *What baseline(s) will you use?* Describe what methods you will use as baselines. Make it clear if these will be implemented by you, downloaded from elsewhere, or if you will just compare with previously published scores.

6. *How will you evaluate your results?* Specify at least one well-defined, numerical, automatic evaluation metric you will use for quantitative evaluation. What existing scores will you be comparing against for this metric? For example, if you're reimplementing or extending a method, state what score(s) the original method achieved; if you're applying an existing method to a new task, mention the state-of-the-art performance on the new task, and say something about how you expect your method to perform compared to other approaches. If you have any particular ideas about the qualitative evaluation you will do, you can describe that too.

Default final project teams will probably write shorter project descriptions than custom project teams. In particular, items (2), (3) and (6) are likely to be very short. As before, there is no need to explain things that are already covered in the default project handout.

4   Submission instructions

Submit your PDF proposal on Gradescope, and *make sure to tag all of your team members* – only tagged team members will receive credit. Additionally, when you tag the different 'questions' in your PDF, make sure to use the default project tags or the custom project tags, but not both.

5   What to expect

We will grade your project proposals and provide brief feedback – for custom project teams, the grader will be the mentor. If there's a problem with your proposed project (e.g. it's not feasible in the given time), we may require you to submit a revised proposal – otherwise, your project is approved. All teams will be allocated Azure credits (based on the team listing in the proposal).

If you want to discuss your proposal before submitting it, you can go to the Office Hours of a knowledgeable staff member (look at the Office Hours webpage to see staff members' areas of expertise).