

CS222 2020: Project Requirements

The goal of the final project is for you to try to initiate new research. The most desirable end result is a conference paper, along the lines of the conference papers we have read in class. However, it is unrealistic to expect a class project to be a complete conference paper! More likely, the project could be the first step toward a full conference paper, that would require additional work (and rewriting) to turn into a conference paper.

It is understood that some projects will not end with success. This is the nature of research. It will not be necessary to obtain original results in order to obtain a high grade on the final project. However, in this case, the final written report must contain substantial evidence of what was learned in the attempt. A description of what was done and either why it did not seem to work as planned or what more needs to be done would be necessary in these cases.

Projects may be done by individuals or pairs—pairs are much preferred. (For the extension class, pairs may not be possible, and individual projects will likely be the norm.) If you wish to work in a larger group, let me know; three-person groups will generally be accepted but somewhat more will correspondingly be expected in terms of output.

The paper can be on any of the topics from class: streaming algorithms, compression, coding, Internet algorithms, etc. I will aim to broadly construe “topics from class” in terms of reasonable recent projects. However, if you have a topic that is “close” but not necessarily clearly on these areas, I strongly recommend you arrange to discuss it with me during an office hour to check if it is close enough before moving too far down a path that won’t work for the class.

Schedule

- **October 15** Project proposal (25%). This should be a 2-3 page document, which should essentially be a rough outline of what you hope the final paper will be about, along with some additional logistics information. You should include the following sections, in this order:
 - an explanation of the question(s) you hope to answer – like the abstract of a paper, but without the answers yet.
 - your planned approach for answering the question. This can be in the form of experiments you plan to do, code you plan to write, or theorems you plan to prove.
 - resources your project requires. (This is to ensure that you are not going to attempt a project that we don’t have the resources for.)
 - backup plans, for when things don’t work out the way you expect.
 - a bibliography of related work. (You will probably want to cite to these works in your proposal, but feel free to add other related work that you don’t directly cite.)

The proposal should not be something that looks like you started it the day before. Make sure you have a clearly defined problem to tackle. Find related work on Google Scholar or arXiv – plan to spend some time doing keyword searches. Try to have the first steps of your research plan outlined.

If you need suggestions for problems, let me know. I can probably find some implementation-oriented projects to suggest. However, it is generally better to find a project yourself that you are interested in.

- **November 10** Status report (15%). This should be a 2-3 page document, summarizing what you have accomplished so far, what you have left to accomplish, and how you plan to accomplish what you have left to do in the remaining weeks.

- **Dec 4/Dec 9** Final written paper (60%). I will aim to make the due date for the project as late as possible, subject to University policy. My understanding is that, officially, for undergraduates, the project can't be due later than the last day of class, which is Dec 4. However, I will accept "revisions" until December 9. The final written paper should be written in the form of a conference paper submission. It should include an introduction, a description of previous work, a description of any original results that have been obtained (or a description of what was attempted), and a conclusion summarizing the results and further directions to follow. The paper should be approximately 15-20 pages (not counting bibliography) with reasonable spacing, reasonable font size, and a single-column format. (Single-column just so it's easier for me to read them all; this should be similar to a 10-12 page double-column submission.) If there are several graphs, tables, or charts it could be slightly longer. If you don't need that much space, it could also be shorter. **Twenty-five pages is an absolute maximum. Longer is not better.**