UNIVERSITY OF CALIFORNIA, DAVIS
DEPARTMENT OF COMPUTER SCIENCE

A Hitchhiker's Guide to the ECS 171/ECS 289 Project

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General Instructions: The last part of your project assignment is to write a report that resembles a technical research paper. The report should be 10-12 pages, single-spaced, 12 pt font. It must be written in LaTeX and is expected to include roughly 8 pages of text, 4-5 figures (either inline or at the end of the document), and about half to one page of references. This guide contains general advice on how to write a technical paper. Style and aesthetics matter; I suggest reviewing published work (ICML, NeurIPS, etc.) to get a sense of what is expected. The guidelines described in this document should serve as a guidepost for how to structure your project report.

1 ORGANIZATION AND STRUCTURE

General Information: When you design a project to test a hypothesis, clearly lay out how you will develop the method and what simulations/experiments you plan to perform. Always think about the questions that you have to answer so that the manuscript presents a complete, compelling story. Before you start writing any report, you should have a general idea of how the main figures will look, and it often helps to actually create these figures beforehand.

Abstract: Write one-two sentences stating the problem you are addressing; two-three sentences that contain a high-level description of how you address the problem (your method); twoâĂŞthree sentences on the results; and one sentence on the broader impact, that is how the advance achieved by this work could influence the field (what it will enable, for the specific field and the

area in general).

Introduction: Start with 1-2 sentences on the general area, then 1-2 sentences on the specific sub-area. Add a paragraph on the specific problem and how it has been addressed so far. Include 1-2 sentences to a paragraph on what is missing from current approaches and why this is important.

Then write a paragraph on what this paper contributes, how you approach this problem and the results of the approach. This paragraph should have **clear, definite claims** on what you have achieved relative to what you claimed was missing in the field (from the previous paragraph). You should not add items that do not relate to the previous missing/desired advances you introduced. If this happens, then either you have not introduced the challenges/missing/desired as adequately as needed, or your claim is irrelevant to this paper and should be removed.

Some people include a last paragraph with the structure of the paper as the closing introduction paragraph. This is optional.

Methods: Divide it into sections that are well-defined around distinct components, algorithms, sub-problems. Put references whenever you use/step on previously published work. Use subsection numbering (3.1, 3.2, etc.). Describe your algorithms and methods fully so that if anyone wants to reproduce your results, they can do so (if there are many parameters, consider including a parameter file as supplementary material).

Results: This should only describe the results that you have obtained. Sometimes it makes sense to discuss your interpretation of why this is happening, but this should be rare. This section should only present the facts about performance, robustness, and complexity.

Discussion: This is where you discuss everything that was presented in the Results section. Explain why the algorithm performed better in X and not in Y. It is ok to succinctly restate strong result claims (that were included in the previous section), as long as you continue to explain, even speculate, why this may be the case. For example: "Our algorithm was faster in X% of the scenarios than what is currently available. The main driver behind this performance boost is the Y module, which takes advantage of the Z characteristic of the problem. Indeed, ..."

Finally, in what some papers refer to as "Conclusion," provide 1-2 sentences summarizing the purpose of this report and 1-2 sentences on what was achieved (these 2-4 sentences are usually similar to, or restate, what was said in the abstract). Then discuss what remains to be done (the road ahead), why (the impact to the field), and how you think it can be achieved (future work). End the report with 1-2 sentences on how the work presented advances the field in the grand scheme of things.

References: Please include all relevant references to provide a succinct and accurate summary

of past work and challenges in the field. Research has found that the more articles you cite, the more you will be cited as well. For this report you are expected to have 10-20 references.

Author contributions: Clearly state what the contributions of each author are. Since you are working in large teams, this is the only place where I can see who did what.

2 Final Presentation

You will be giving a presentation in class. Prepare slides for a 15-minute presentation that will cover the whole project and follow about the same structure as the technical report. All members of the team may speak during the presentation. Be prepared for 3-5 minutes of Q&A at the end of the presentation. Your grade for the project will be determined by the work conducted, the quality of the presentation, and the quality of the term paper.

Good luck!
May your gradients descend and your losses converge...