UNIVERSITY OF CALIFORNIA, DAVIS
DEPARTMENT OF COMPUTER SCIENCE

A Hitchhikers Guide to the 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 will be 8-10 pages, single space, 12pt font. It has to be written in latex and it is expected to have (roughly) 6 pages of text, 4-5 figures (either *in situ* or at the end of the document) and about half to one page of references. In the case of teams, one report will be submitted from the whole team, with the respective author list. This guide contains some general advice on how to write a technical paper and can serve as a guide post on how to structure your report. The last page provides some guidelines on how to present your project to the class or any other audience.

1 ORGANIZATION AND STRUCTURE

General Information: When you design a project to test a hypothesis, try to lay out how you will address a method and what simulations/experiments you should perform. Always think of 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 like and it always help to actually create these figures beforehand.

Abstract: One-two sentences on what is the problem that you addressing. Two-three sentences that contain a high-level description on how you address the problem (your method). 2-3 sentences on the results. 1 sentence on what the advance that has been achieved with this work can influence the field (what it will enable, for the specific field and whole area in general)

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

Then 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 in relation to what you claimed that is missing in the field (from the previous paragraph). You should not add items that do not relate to the previous "missing/desired" advances that you introduced before. If this happens, then either you have not introduced the challenges/missing/desired in the previous paragraph adequately, or your claim is irrelevant to this paper and has to be removed.

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

Methods: Divide it into sections that are well-defined on the distinct components/algorithms/sub-problems. Put references whenever you use/step on previously published work. Use sub-section indexing (3.1, 3.2, etc.). Describe fully your algorithms and methods, so that if anyone wants to reproduce your results can do so (sometimes this is difficult if there are many parameters, in which case a parameter file should be included as suppl. mat.).

Results: This should only describe the results that you have obtained. Sometimes it make sense to discuss your guess/opinion why this is happening, but this should be rare. This section is to only present the facts about the method performance, robustness, complexity, etc.

Discussion: This is where you discuss everything that was presented in the Results section. Why did the algorithm perform better in X and not in Y. It is ok to succinctly re-state 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 drive 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", you provide 1-2 sentences of the purpose of this report and 1-2 sentences of what was achieved (these 2-4 sentences are usually similar or re-stating what was said in the abstract). Then you go on to discuss about what remains to be done (the road ahead), why (the impact to the field) and how you think it can be achieved (future work). You end the report with 1-2 sentences on how the work presented advances the field in the grant scheme of things.

References: Please include all relevant references for the paper, 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 too. For this report you are expected to have 10-20 references.

Author contributions: Here you clearly state what the contributions of each author are, in cases where you work in teams.

2 PRESENTATION

You will be giving a presentation in class. Prepare slides for 20 minutes of presentation that will cover the whole project and will have about the same structure as the technical report. All members of the team should speak during the presentation. Be prepared for 3-5 minutes of Q&A at the end of the presentation. Your grade in the project will be determined by the work conducted, quality of the presentation and the quality of the term paper.
In the next page, I have some general information on how to structure a good presentation.

GOOD LUCK!

Every time you are presenting to an audience, it is an opportunity to share with the world something worth knowing about. There are some basic principles to guide any presentation:

- **The audience is the client:** The presentation is not about you, is about serving the audience. Don't waste their time or yours with not being adequately prepared or focus on what interests you, not them.
- **It is your responsibility to make the audience understand the message**: If they don't, you are not doing something right. Maybe you don't provide the high level picture, or you don't explain the details enough. Whatever the reason, it is not that "they don't get it".
- **Prepare adequately:** Start early, create good visuals, rehearse. There is no substitute for that. Understand how you are perceived by your constituents and improve your presentation. Be cognizant of the time limit and pace accordingly.
- **Seek help:** Ask a team member, your mentor, your friend to sit in one of your rehearsals and provide comments. Fail, improve, repeat.

Regarding the structure of each presentation, here is the general direction:

1. Introduction:

- **Challenge:** What is the problem that you are talking about ? Why is it a problem?
- **Significance:** Why is the problem important? How many people/processes/$ are affected?
- **Background:** What has been done so far to address it ? What are the limitations of current efforts? Where is the bottleneck?
- **Your approach:** What do you propose? How is it different/innovative than the previous ? Why is it better than what was done before

2. Approach/Methods:

- **Overview of your approach:** Provide an overarching figure that connects the different steps/methods/modules that you will be explaining.
- **Description of each module/process:** Describe each module in sufficient details, while take into account of the amount left

3. Results:

- **Present your claims:** never more than one claim per slide. Each claim should be one sentence and backed up by plots/figures that substantiate the claim.
- **Do not overcrowd slides:** Your slides should not be overcrowded with information have other information as backup or alternative slides that you show only if asked.

4. Conclusion

- Restate the challenge, approach, results - what you learned
- Provide future directions and items to follow up
- Acknowledge people, processes, institutions
- Thank the audience and ask for questions