Project Guidelines

Contents

INTRODUCTION

The goal of the final project is to provide the opportunity for you to investigate in depth a particular area of operating systems and conduct operating systems research. The size of the project can vary, but thinking of it as a conference paper is a reasonable model. Final projects are to be undertaken in teams of three students. If you have a project that you feel warrants a fourth participant, please check with me first. You can use Piazza to find students in the class and their interests.

For this project, you need to pose a question, design a framework in which to answer the question, conduct the research, and write up your experience and results. There will be three deliverables for this project which will count toward your final project grade: a project proposal and research plan, an in-class presentation, and a final report. Further information about the deliverables is available below.

The topic of the final project is largely up to you, though you have to get verbal approval before proceeding to project proposal. So please check with me before fully committing to the project. Some guidelines for choosing a project are: (1) the work can be completed in time, (2) you have the required hardware and software to enable you to conduct the necessary research, (3) the research project has something to do with operating systems, (4) the project is structured in such a way that you can have quantitative results, and (5) you will learn something from doing this project.

Project Types

The project can take one of three forms:

1. Survey

Your project will survey the major research results and directions of a particular systems reseach area. You will need to identify the area, propose a set of 8-10 papers for that area, read the papers, and write a 6-10 page report. The report should emphasize breadth in the area, classify the approaches and techniques, distinguish contributions made by the various research projects described in the papers, and hypothesize about potential future research directions.

2. Proposal

Your project will propose a novel direction of research. You will need to identify the area, propose a set of 4-6 papers to read as background, and write a 6-10 page report. The report should start with a brief summary of previous and related work, describe the problem or questions you propose to investigate or answer, justify why they are important, and then outline a methodology for conducting the research. The methodology should include an approach for conducting experiments (e.g., simulation, analytic modeling, instrumentation, measurement, and implementation), a set of experiments to perform, and a discussion explaining how the experiments investigate the problem or answer the questions.

3. Implementation

Your project will implement an idea proposed abstractly or theoretically in a paper, or conduct further experiments that extend work in a paper. You will need to identify the paper, propose an implementation project or set of experiments to perform on an existing implementation, and write a 4-6 page report. If you would like to continue a set of experiments on an existing implementation, I will help you obtain a copy of the implementation from the appropriate research group (internally or externally). The report should summarize previous work, state the problem you are investigating, and then describe the implementation or set of experiments you performed. If you performed experiments, you should clearly describe your experimental methodology and the results of your experiments.

IMPORTANT DATES

Budget your time wisely for the team project. Plan a time-table for your project and take pains to observe the deadlines. Deadlines are **Fridays** end-of-the-mentioned-week

Week #1: Team Forming

Week #3: Ideas pitching & verbal approval

Week #5: Formal proposal document.

Week #11: Project Presentation

Exam Day: Final Report.

Project Proposal Template

a. **Name/s of student/s conducting the project**:

b. **Working title of the project**:

c. **Rationale for the project**: *(How does it fit into the overall structure and goals of this course? 350-500 words)*

d. **Specific goals of the project:** *(What exactly do you wish to accomplish by doing the project? Indicate how you will know you reached your objective/s)*

e. **A detailed plan of activities you will complete to finish the project**: *(Include a timeline and assignments of responsibilities.)*

f. **A description of the final product that will emerge from your work**:

g. **References**

Download this form, delete everything in italics and use it to guide you as you write the proposal.

Project Presentation Guidelines

Presentation allocated time will be announced at presentation scheduling time (typically 15 to 20 minutes). Plan to give about 5 minutes time for questions and discussion. **Plan your time properly, you will lose points if you go over your allocated time.** You will get notification every 5 minutes to help you to be aware of your timing.

Presentations should be self-contained, and should be clear and precise. Briefly introduce the topic including any background information, describe the investigation, development, or experimentation that was conducted, and provide any demonstrations developed as part of the project, or describe the results of the investigation or experimentation. The following format is suggested:

(1) Title. Name the project and all the team members.

(2) Outline. Summarize the full presentation.

(3) Introduction. Introduce the purpose and goals of the project. Provide any background material necessary to understand the presentation.

(4) Investigation, development, or experimentation conducted. Describe the actual work performed during the project.

(5) Results. Show any demonstrations developed or results achieved during the project.

(6) Conclusion.

(7) Questions and discussion.

Final Report Template & Guidelines

Final report is due by midnight on *(or before)* the day of Final Exam.

The report should be a standalone document. Meaning, someone who has not seen any of your presentations should be able to read and understand it.

If you used any resources to understand your project, please cite them. A good place for these citations is in the background section at the beginning of the paper but they may be placed in other sections as well. Also, if you based any part of your implementation off of an existing design, please cite the document you used. It is understood that your design may have been influenced by previous work. Don't avoid citing out of fear that your design is "not original enough". *Please remember I know how to google (and am pretty good at it)* ☺

Your paper should follow the IEEE template for Conference Proceedings with US Letter paper size. Latex and Word templates are available for free at

http://www.ieee.org/conferences_events/conferences/publishing/templates.html

Here is a suggested outline and page breakdown for your report. The flow will roughly follow the outline of your final presentation, but should include more details. You do not need to strictly follow this outline, it is here just to give you an idea of what we will be looking for. Also, feel free to add additional information not explicitly mentioned in the outline below, if you think it will help explain your work.

1. Project Objectives.

   Describe the purpose of your design, and what you expected to accomplish with your project. Briefly provide any background that someone would need to understand what you were attempting to accomplish and the importance of your project. (≈ 0.5 page)

2. The Design.

   If appropriate describe the algorithm(s) chosen. Describe the high-level structure of the design, ideally using a block diagram. Describe any particular design and/or implementation challenges you had to overcome, and how you addressed the challenges. (≈ 2 page)

3. Design Methodology and Space Exploration.

   Describe the steps you took to develop and verify the function of your design and your Chisel implementation. Describe your design space parameters, and your approach to exploring the space. What are your design metrics? (≈ 1.5 page)

4. Results of the Exploration.

   Think about how to best present the data you collected that clearly supports your findings and conclusions. Tables and graphs are useful here. Tables are good for completeness (can show lots of numbers); graphs are better for presenting an intuitive understanding. (≈ 2.5 page)

5. Summary of Results.

   Summarize your findings and any conclusions you can draw about the results. (≈ 0.5 page)

6. Retrospective.

What have you learned from this experience? How would you do it different next time? Please include any comments on how we might improve the course next time. Also, please include any comments that we might pass on to the Chisel development team. (≈ 1 page)

7. References.

   Include citations to any document you used. Use inline citations throughout the document with the bibliographic information at the end.

Part of your final grade will be based on a report grade. For the report grade, we will consider clarity, organization, and grammar. Make sure to proofread and correct mistakes before turning it in.

Please turn-in your report as BOTH an MS-Word & a PDF file.

Final report submission guidelines (must be strictly followed)

PLEASE NOTE: these guidelines MUST be strictly followed. Failure to do so will result in getting an 'F' grade for your report. Due to pressure of grading your final exams and reports in time, I cannot chase down each teams' documents and files.

How to submit:

- **Each team will submit ONLY 1 zip file that has the contents as mentioned below. That zip file must be named as** <teamname>.zip
  - **Material must be properly organized inside the zip file (folders, etc).**
  - **That zip file may contain other zip files inside if needed.**

What to submit:

Inside that zip file, the following contents must be included as follows:

- Final **Report (both .docx AND .PDF)**
  - File MUST be named as: <TeamName>-<project title>.docx
  - See report guidelines section next for final report format
- Final version of **slides (**PPTX only)
  - Slides file MUST be named as: <TeamName>-<project title>.pptx
- A folder for all **source cod**e (if any) & **Output samples** (if applicable)
  - Complete Source code including libraries
  - Everything needed to build your code including project files, build instructions, etc
  - Executables (if applicable): either on Linux or windows.
- A folder for references, extra material, etc.
  - Include a soft copy of all the references you used / cited / mentioned.

GENERAL GUIDELINES

Grading of written reports and presentations will be based upon substantive content, appropriate organization and use of allotted report size or presentation time, and effectiveness of the presentation or report. Multiple errors in grammar and spelling are unprofessional and detract from the clarity of your report or presentation and will be graded accordingly, so use a spell checker!