

Final Project in Applied Formal Methods

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1. Initial Project Plan: Statement of Work

Due Date on Website

For the initial project plan, each person/group will submit a statement of work that specifically addresses the following questions:

1. Define your group and the parameters of your project.
2. Who are the members of your group? (Your group may have 1, 2, or 3 members.)
3. What is your group name?
4. What formal method are you using?
5. What specifications will you verify?
6. What system will you analyze?
7. **For 507:** What is the novel research component of your project?
8. What does a success look like for your project? For example, a successful model checking project will be able to demonstrate a system model, validation of that model, a set of temporal logic specifications, a set of model checking runs checking the specifications against the model, and an analysis of the results. A successful theorem proving project will be able to demonstrate a set of (validated) theorems that automatically prove in an automated theorem prover and an analysis of the results of the proofs. A successful project in runtime monitoring will be able to demonstrate a set of specifications, a set of runtime monitors constructed from them, experimental results over many system runs demonstrating correct operation of the runtime monitors, and analysis of the results.
9. How will you demonstrate your analysis? In other words, answer all of the following questions that relate to your project:
 - What benchmarks will you use? Where will you get them from?
 - How will you demo your analysis (in the class?) (in your final report?)
 - How will you measure your results?
10. Remember to think about important logistics and organization elements. Each person/group will collaborate via a git repository that the Professor and TA also have access to. What will be the structure of your repo? How often should members check point models/specifications/documentation elements? If the project is a group project, how will the group coordinate? For a group, when will group meeting be? For a single-person project, what time have you scheduled each week to work on the project?

11. Provide a project timeline: for each week, list what you plan to accomplish that week. Be realistic and make backup plans! Your group will email (to the Professor and TA) a (short) report at the end of each week with a project update according to your weekly plan. This email can be as simple as a statement that all tasks were accomplished that week, or as complicated as a detailed explanation why something did not work and how you have replanned to do an equivalent task. **Weekly reports are due at 5pm on Fridays. This is your chance to get feedback on your progress and questions every week!**

2. Progress Report and Preliminary Results

Due in the form of a Mid-project in-class presentation, per the schedule posted on the course website

Provide a preliminary report from your group on your progress so far. The report will be in the form of an in-class presentation of your results-so-far, making sure to **explicitly** answer the following questions:

- What parts of your project have you completed? Provide a bulleted list of work outputs to date.
- Provide an outline of your final report. What will the format be? What sections will you include? How do you plan to present any data and your analysis?
- What challenges have you encountered so far and how do you plan to overcome them? Provide a bulleted list of pairs {Challenge, Plan for action} to answer this section.
- Do you think you will need to change/modify/add to your project in any way? If so, make your case here. For example, if you have discovered that all of your specifications fail when analyzed against your system, what is your plan to modify the system and/or specifications?

3. Final Report and Presentation to the Class

- **Each person/group will present their project and results to the class during the last class periods.**
- **The final report from each person/group is due during the scheduled final exam period**

The final report will follow the outline and format described in the preliminary progress report. It will include the deliverables listed in the initial project plan/statement of work. Specifically, make sure to include the following:

- **All models, specifications, code, or other artifacts needed to reproduce your work and re-run the verification tasks you completed for your project. If I cannot re-run your verification, I cannot grade it.**
- Overview of your project including introduction, motivation, problem setup, and other information needed to understand the problem domain.
- Related work and background information. Cite any resources you used in the design and completion of this project.

- How did you perform validation?
- What precisely did you verify? What does it mean? How are your results significant?
- Include a complete analysis: results, performance of the tool you used, etc.
- A bibliography. Chicago Manual of Style (CMS) format is preferred.

Remember that the final report is cumulative; it needs to include *all* work done for your project in a complete report. Failure to include any of the required sections listed above will result in losing points, even if the work was mentioned in class or in a presentation.