CSCI503: Parallel Programming

Final Project

Revision: 1.1 – April 22, 2013

1 Introduction

By now you should have received feedback on your project proposal (let us know if you have not) and be ready to start/continue working on your project. The goals of your project should align with the goals of this course. Ultimately, parallel computing is employed to solve the speed and/or the size problem. What problem has your project solved? And were you successful in meeting this goal? Your efforts will be evaluated along the following criteria:

1. **Technical merits.** Does your project embody underlining technical strengths? In other words, is it too simple? As a graduate-level course, we expect a certain level of sophistication in how your team applies the various parallel programming paradigms. While it is understandable that projects are not always successful, we intend to measure your final product as a function of efforts, maturity, and completion. Therefore, it is in your best interest to complete the project.
2. **Creative merits.** On the surface, one could argue that this evaluation metric is subjective. We argue otherwise, and our views are as followed. Does your project do the minimum implementation (e.g. typing in an existing algorithm)? What is your experiment's setup? Is it a canned configuration or does your team make (extensive?) modifications to suit your project's objective? Do you look at the problem and solution through a different set of lenses?
3. **Presentation of your results.** The presentation of your final product is two-folded. First, each team will put together a poster. Second, your team should include a formal project report. We expect the poster and final report to be high quality — as if you were to submit this project to a conference.

Finally, we cannot stress this point enough. Your work must be original. If you use an external source (whether it's source code, algorithm or ideas), you must cite source where appropriate. In the past, students have submitted reports that are cut-and-paste from the Internet. The outcome of their final grade, unfortunately, has been extremely unpleasant. When in doubt, write report your words and give credit where credit is due.

2 Poster

The format of the poster is fairly open-ended. At the minimum your poster should include the following:

- Title, team members, and affiliation (e.g. department and university).
- Background and motivation; an abstract is highly encouraged.
- Research innovation, findings and discovery, and conclusion.

You are free (and encouraged) to include graphics, charts and/or other means to visually stimulate your readers. Your poster is an opportunity to show case your "research" and accomplishments. Needless to say you should proof-read your poster and be prepared to answer questions.

3 Report

All projects must include an evaluation and analysis of performance or another metric of "success"' where appropriate. The analysis should also discuss challenges, unexpected results, and the adequacy (or inadequacy) of the parallel programming algorithm, model, or technology with respect to the problem.

Your team must submit both a report and your code via Blackboard (you should also bring a hard copy of the report to the poster session). The final report must include:

- A short description of the problem to be solved and why you chose it.
- A short discussion of your choices of parallel platform and programming model.
- A high-level description of your implementation.
- Measurements of performance of your parallel implementation on the target platform. If your implementation is a parallelization of an existent sequential algorithm/program, include measurements for the sequential version as well. We recommend that you report FLOPS for scientific computations using floating-point operations.
- Analysis of the measurements reported: How much parallelism were you able to exploit? What (if any) are the performance bottlenecks? How does your algorithm scale with the number of processes, for a fixed input data set?
- Lessons learned: Discuss unexpected results, the adequacy of the programming model and target platform for your particular problem, and contrast it with your expectations from the project proposal.
- Future work: Discuss potential future work and/or applications of your project.

4 Grading

Grading breakdown for your final project will be as follows:

- Poster presentation [20 points]
- Project report [20 points]
- Code (plus building instructions) submitted via Blackboard [10 points]

Poster sessions date: Monday, May 13 2-4 p.m. (attendance is mandatory)
Location: TBD

Please bring your final report to the poster session. One report per team.