

Parallel Programming and Computing: Group Project

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1 Description

We talked about this in the last class. This document serves to provide a check-list for the completion of your group project.

The central key requirement of your group project is that it **must involve** the design, development in software and experimentation of a parallel or distribute system. *The end goal is that you are making progress towards a result that is of high enough quality to be published.* Beyond that, you are free to explore any particular application that is relevant to your research.

Examples of a project might be:

- Parallelization of components in an existing Computational Fluid Dynamics (CFD) code using threads.
- Construct a new discrete-event model using a parallel simulator (e.g., ROSS).
- Parallelize an existing sequential data mining algorithm using threads, MPI or CUDA parallel programming frameworks.

The key components of your project submission paper:

1. A 1 page or longer description of your project. It is critical you pick something you and your team can complete.

2. List your team members. Teams can have up to 4 members. For each team member describe their contribution to the overall project. That is, what did you do besides attend meetings?.
3. Describe your parallel implementation both code and algorithms used.
4. We have read a number of papers this semester. So, provide a review of related published articles.
5. Performance results. This will include your sequential and parallel results and indicate your overall speedup. You should perform a “strong scaling” study (i.e., problem size remains the same and processor count grows).
6. Analysis of performance results. Provide additional information on why your performance turned out the way it did. In particular, you should understand how much communication overhead your program incurred versus doing real computational work. This should be measured and quantified.
7. Summary and future work. Provide a summary of what you did and directions of where you think this project could go in the future. That is what problems did you not have time to solve.
8. You can expect your paper/project write-up to be a similar length as a regular conference paper – 6 to 8 pages double column 10 point font.
9. Hand in your code on Area51 in one of the team members account. Please make sure to list whose account the code is under. Also, provide some sort of README on how to run the code.