CSc 387: Parallel Programming with MPI

GROUP PROJECTS

General Guidelines:

- Immediately after the first midterm, you will form your groups and choose either a topic of your own or one of the topics given as your term project.
- Use the on-line search facility at the library to locate some of the relevant papers on your topics of interest as early as possible. You may need to order some of the papers using the interlibrary loan.
- **Presentations** : 20-25 minutes long. Powerpoint slides must be used. **You need to make your PPT slides available before your presentations. 25% of your grade will be based on the quality of your slides**. Presentations will be evaluated by the class and the instructor.
- Presentations will take place during the last two weeks of classes. You will have a drawing in order to decide the exact time for your presentation.
- **Bonus:** Students who develop significant parallel code for their semester project and demonstrate it successfully will receive bonus points towards their final grade.

Potential Topics for Projects :

1. Parallel Processing for Bioinformatics Applications
2. DNA Sequencing (Parallel Approximate String Matching and Finding Minimal Common Super String)
3. Parallel/distributed data-mining (the Netflix Prize which seeks to improve the accuracy of predictions about how much someone is going to love a movie based on their movie preferences)
4. Bio-Inspired Solutions to Parallel Processing Problems (ant algorithms, genetic algorithms, cellular automata, DNA and molecular computing, neural networks)
5. Cellular computing / cellular automata / Intelligent Agents
6. Quantum Computing / DNA Computing
7. Parallel image processing algorithms (parallel volume rendering/ray tracing, segmentation, region growing, Hough transform, component labelling, clustering, etc.)
8. Communication issues in Mobile Computing (Broadcast/multicast etc.)
9. Parallel game programs (e.g. chess, othello, go, etc.)
10. Grid Computing
11. Dataflow Computing
12. Systolic Algorithms
13. Design and implementation of parallel algorithms for the solution of nontrivial combinatorial optimization problems (examples : Traveling Salesman Problem, 0/1 Knapsack, Composite Graph Coloring, 8-puzzle, 8-Quinn's, etc.).
14. Static and dynamic task partitioning and data distribution strategies for parallel computing
15. Future Trends in Massively Parallel Computing
16. Compute intensive applications in science and engineering that require supercomputing power for solution (computer simulations of natural phenomena in physics, chemistry and engineering).
17. Any topic that you are interested which is related to parallel computing.

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EVALUATION FORM FOR PRESENTATIONS

Name of the student(s) :
Topic presented :

Evaluation criteria :

5:STRONGLY AGREE 4:AGREE 3:NEUTRAL 2:DISAGREE 1:STRONGLY DISAGREE

1. I feel that the group spent a considerable time for the success of this project.

   5 4 3 2 1

2. The material and/or results presented are relevant to parallel processing and have significant value

   5 4 3 2 1

3. The speaker was well-organized and made a clear presentation. Slides were prepared neatly and they were informative

   5 4 3 2 1

4. Sufficient number of slides were used and the speaker made good use of his/her time to finish the presentation on time

   5 4 3 2 1

5. He/she stimulated interest in the subject area presented

   5 4 3 2 1

OVERALL GRADE (Final grade will be based on this grade) : 5 4 3 2 1

COMMENTS :
