CSc 5802: Introduction to Parallel Programming and Algorithms

GROUP PROJECTS

General Guidelines:

- You will form groups of one or two people and choose either a topic of your own or one of the topics given below as your term project. Search and find at least 3 relevant papers on your topics of interest as early as possible.
- Presentations: Powerpoint slides must be used. A significant part of your grade will be based on the quality of your slides. Presentations will be evaluated by the instructor based on the criteria mentioned in this document. 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. Grid Computing
2. Parallel Compilers
3. Contemporary Languages/Libraries for Parallel Computing
4. Quantum Computing
5. DNA Computing
6. Systolic Architectures & Algorithms
7. GPU Computing
8. Dataflow Computing
9. Cloud Computing
11. Static and dynamic task partitioning and data distribution strategies for parallel computing
12. Parallel Processing for Bioinformatics Applications
13. DNA Sequencing (Parallel Approximate String Matching and Finding Minimal Common Super String)
14. Bio-Inspired Solutions to Parallel Processing Problems (ant algorithms, genetic algorithms, cellular automata, neural networks, etc.)
15. Distributed Algorithms for Mobile Sensor Networks
16. Parallel game programs (e.g. chess, othello, go, etc.)
17. Design and implementation of parallel algorithms for the solution of nontrivial combinatorial optimization problems (e.g. Traveling Salesman, 0/1 Knapsack, Graph Partitioning, 8-Quinn’s, etc.).
18. Compute intensive applications in science and engineering that require supercomputing power for solution (computer simulations of natural phenomena in physics, chemistry and engineering).
19. Parallel image processing algorithms (parallel volume rendering/ray tracing, segmentation, region growing, etc.)
20. Future Trends in Massively Parallel Computing
21. Any topic in parallel computing that you are interested in (needs instructor’s permission).
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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 :

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