Guidelines For Term Projects

Potential research topics:

1. Quantum Computing
3. DNA based computing
4. RSA Factoring-by-Web (http://www.npac.syr.edu/factoring/overview.html#TeraflopChallenge)
5. Bioinformatics and massively parallel processing
6. Reconfigurable computing: algorithms and architectures; Field Programmable Gate Arrays for reconfigurable computing
8. Parallel Data Mining
10. Scheduling, task decomposition, and load balancing strategies for multicomputers.
12. Parallel hardware and software techniques to store and retrieve massive volumes of data.
13. Large distributed databases: issues and implementations
15. Parallel image processing algorithms (segmentation, region growing, Hough transform, component labelling, clustering, etc.)
16. Design and implementation of parallel branch-and-bound 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.).
17. Current research on parallel solution of large sparse linear system of equations ($Ax = b$) on multicomputers.
18. Any topic that you are interested which is related to parallel and distributed processing.
General Guidelines –
Presentations, term paper, and grading:

• By the end of first week of classes, each student will bring a list of ten interesting research topics related to massively parallel computation.

• The second week of classes, each student will either choose or be assigned a topic of research for the semester.

• The third week of classes, each student will prepare an abstract including 5 most recent references in the selected research area.

• Before the mid-semester, each student will make at least one powerpoint presentation in the selected research area. The presentations will be comprehensive and will last 35-75 minutes depending on the total number of presentations scheduled for the semester. Each presentation will be evaluated by the students and the instructor.

• Towards the end of the semester, each student will make a second and final presentation in the previously selected area. The presentations will be comprehensive and will last 75 minutes. Again, each presentation will be evaluated by the students and the instructor.

• By the end of the semester, each student will write a paper (report) in the research area presented.

• 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. It takes around 1 week to get them, therefore, it is better to place the orders in advance. Here is the information you need to start using “MERLIN”:
  On WWW, go to URL address: http://web.umr.edu/~library/databases.html and from the menu “Select Databases by Name” choose FirstSearch and any other Database of your interest. After you enter FirstSearch, you will be given access to a number of databases. You may use anyone of those, however, my favorites are “Article1st” and “PapersFirst” under the “Jump to Advanced Search” menu. At this point, you may enter the keywords that you will be looking for a match. You may click on the “help” button for more information.

• Term Paper: Format is given in the next page. At least 5 relevant papers written recently in the area of interest must be read, understood and referenced in your paper. Grading of the papers will be done as follows: Format (organization? does it comply with the format provided?, page numbers, alignment, spacing, writing style) 25%, references (relevant?, current?, enough?, format?) 15%, are the references cited properly in the paper? — > 10%, Contents (cohesive? consistent? informative? significant? creative? original? taken directly from references?) 50%

• Grading: as explained in the course syllabus.
TERM PAPER

The paper should be approx. 10 pages (11/12pt. font, single space) excluding the title, table of contents and the abstract pages. Follow the same format used in a major computer journal (i.e. IEEE Transactions). Here are some guidelines (format) that could be helpful for your technical writeup:

i. TITLE (name, affiliation, etc.)

ii. TABLE OF CONTENTS

iii. ABSTRACT
    summarize, in one paragraph, the research problem discussed in the paper. Why is it important (motivation)? What are the most common or contemporary approaches to solve it? And what approach is presented here.

1. INTRODUCTION
   Introduce the problem in general (giving some references), mention the previous work (with references), their strengths and deficiencies, and explain in detail the approach presented in your paper. Draw figures if necessary.

2. RELEVANCY TO MASSIVELY PARALLEL PROCESSING
   How would this approach benefit from massively parallel processing? or how would it contribute to massively parallel processing? Show the relationship of this research to massive parallelism.

3. IMPORTANT RESULTS AND THEIR IMPACT
   Discuss the most important results that came out of this research. (any important theorems and breakthroughs must be mentioned) Provide as many figures/flowcharts/plots as you could to explain your point.

4. DISCUSSION/CONCLUSIONS
   Summarize what you have studied/done in this paper. Mention any major results discovered and how they compare to those previously reported.

5. IMPROVEMENTS and FUTURE DIRECTIONS
   Can you suggest anything that can improve the existing approach? How would this research evolve in the near future?

6. REFERENCES
   You should list the references you used in your study in an orderly manner. Whenever you make a reference, make sure you use the correct reference number in your paper. Follow the same format used in a major computer journal (i.e. IEEE Transactions)
CSc 487  EVALUATION FORM FOR PROJECTS & PRESENTATIONS

Name :  Topic :

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

EVALUATION OF THE PROJECT :
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1. I feel that the student(s) 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 massively parallel processing and have significant value
   5  4  3  2  1

EVALUATION OF THE PRESENTATION :
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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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