

CPSC 521 – Fall 2012

Syllabus

The course will include the following topics, each taking around 5 lectures. Where possible I will follow the material from Wilkinson and Allen, but will need to augment the material from papers and other books. There will be 2-3 lectures on getting started with MPI (Message Passing Interface) and executing programs on a cluster.

1. Models of Parallel Computation
 - (a) Defining a model for parallel computation
 - (b) Scalability, Speed-up and Efficiency
 - (c) Limits of Parallelism
 - (d) Measuring Performance
2. Communication
 - (a) Communication abstractions
 - (b) Simple communication problems
 - (c) Topologies and communication problems
 - (d) Networks and fabrics
3. Algorithms
 - (a) Shared memory algorithms
 - (b) Processor farm and centralized strategies
 - (c) Graph Algorithms
 - (d) Datamining/MachineLearning/Bioinformatics (one of)
4. Languages and Systems
 - (a) Language support for parallelism
 - (b) Parallel Runtime
 - (c) Cloud-based systems

Evaluation

Your final grade will be based on a collection of 8 assignments. These assignments will be part of a portfolio that will be used to evaluate what you have learned in the course. The assignments will not be entirely fixed (i.e., you are free to choose your own or pick from those I suggest). The

assignments must be a mix of programming exercises, essays or critiques, or reports on experience of installing a system or tool. They must be fairly limited in scope and each will be worth 5%, 10% or 15% of your mark. You can decide on the weighting of the assignments. It must sum to 80.

The final versions of the assignments are not due until the end of the term. I will meet to review the portfolios twice during the term and once at the end of the term. I expect the work to be done evenly over the term. There will be a final presentation to the class about your portfolio and a meeting with me at the end of the course to review the portfolio. The final 20% will be based on your presentation and the overall quality of the portfolio.

The reason for this method of evaluation is to provide you with more flexibility in the type of assignments and allow you to concentrate your effort in those assignments that are of particular interest.