

CSE 462 – Assignment 1
Professor David Abramson

Due Date – Friday 29th September 2006

High performance computing systems have underpinned significant advances in science, engineering and commerce. They have made it possible to find accurate solutions for many problems that could not be solved using traditional methods. Many of the today's products are developed using high performance computational models, and many services would not be possible without high performance machines.

In this assignment you are asked to *research all* of the application areas listed below, and provide a short description of how high performance machines are applied to some aspect of each of the problems. You should read sufficient material to give you some understanding of the outcomes for the area, and the underlying computational methods (for example, the numerical methods involved, or the computer science algorithms employed). About half of the description for each application area should be devoted to the outcomes, and the other half to the methods.

The best source of material is likely to be conference and journal proceedings, and the Web. Please be very careful about citing appropriate reference material and be careful not to simply cut and paste from electronic sources. You are encouraged to use diagrams where appropriate.

Your report should not exceed 8 A4 pages (excluding references) and should be prepared using the IEEE Computer Society Press format, which are available at http://www.ieee.org/portal/cms_docs/pubs/confpubcenter/pdfs/samplems.pdf

You are to submit your assignment electronically in PDF format (or RTF if you cannot generate PDF) to davida@csse.monash.edu.au, and the subject line should use the following text string "CSE 462 Assignment 1 Submission". In the body of your e-mail you should include the following text:

I,, declare that this submission is my own work and has not been copied from any other source without attribution. I acknowledge that severe penalties exist for any copying of material without attribution, including a mark of 0 for this assessment.

Application Areas

- Long range climate prediction (as opposed to weather modelling)
- Wind Farm simulation
- Aircraft engine simulation
- Medical Applications
- The Large Hadron Collider @ CERN
- Computational Drug design
- Tsunami modelling
- Computer generated movies and animation