Introduction to parallel programming and HPC systems

Introduction to parallel programming

Courses lectured over several afternoons will give an introduction to parallel programming.

All courses are free of charge.

All lectures are held in English.

All courses are held twice every year (February and September).

Registration: Send an e-mail to: adm@hpc.ntnu.no

(Please add your NTNU User Name in the Registration Email)

Topics covered:

- A walk through of cluster architectures. Amdahl's vs Gustafson's law. Simple MPI-calls, programs with MPI-collective
- OpenMP Programming for CPU and GPU, and hybrid programming (MPI/OpenMP). (OpenMP for GPU is only in September)
- MPI: Programming examples and Algorithms
- (Only in February) Parallel Matlab programming and distributed Matlab using MPI.
- Introduction to Jupyter Notebooks is a tutorial showing the basic use of Python in a Jupyter Notebook

Install a Matlab Client on your laptop. See http://www.ntnu.no/adm/it/orakel and Programvaredistribusjon

The MPI course consists of two parts: an introduction to MPI and a second part that covers a lot of the examples from the IBM's Redbook "Practical MPI programming", Practical MPI Programming - IBM Redbook

Remember to bring your own laptop.

(For Window users: Please install a ssh client, like X-Win32 (which you find in software.ntnu.no), or PuTTY with an X-server on your computer e.g. Xming

Date and place.

Date: August 29, September 3. to 12. - 2019

Location: Bygg-teknisk, L10, Gløshaugen NTNU - Trondheim, Norway

(Use the smart phone app MazeMap for navigation)

Registration: (see above)

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Duration</th>
<th>Room</th>
<th>Subject</th>
<th>Instructor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aug 29</td>
<td>15:15</td>
<td>~3hrs</td>
<td>L10</td>
<td>Introduction to Jupyter Notebooks (Optional for HPC users)</td>
<td>Bjorn Lindi (<a href="mailto:bjorn.lindi@ntnu.no">bjorn.lindi@ntnu.no</a>)</td>
</tr>
<tr>
<td>Sep 03</td>
<td>14:15</td>
<td>~3hrs</td>
<td>L10</td>
<td>Introduction to Linux, Optional, very elementary, mostly for newcomers to &quot;command line&quot; linux</td>
<td>Egil Holvik (<a href="mailto:egil.holvik@ntnu.no">egil.holvik@ntnu.no</a>)</td>
</tr>
<tr>
<td>Sep 04</td>
<td>15:15</td>
<td>~3hrs</td>
<td>L10</td>
<td>Introduction to parallel programming</td>
<td>Jan Christian Meyer (<a href="mailto:jan.christian.meyer@ntnu.no">jan.christian.meyer@ntnu.no</a>)</td>
</tr>
<tr>
<td>Sep 05</td>
<td>15:15</td>
<td>~4hrs</td>
<td>L10</td>
<td>Introduction to OpenMP Programming part 1, with exercises in C and Fortran</td>
<td>John Floan (<a href="mailto:john.floan@ntnu.no">john.floan@ntnu.no</a>)</td>
</tr>
<tr>
<td>Sep 10</td>
<td>15:15</td>
<td>~4hrs</td>
<td>L10</td>
<td>OpenMP part 2. Hybrid Programming OpenMP and MPI, with exercises (C and Fortran)</td>
<td>John Floan (<a href="mailto:john.floan@ntnu.no">john.floan@ntnu.no</a>)</td>
</tr>
<tr>
<td>Sep 11</td>
<td>15:15</td>
<td>~3hrs</td>
<td>L10</td>
<td>MPI: Programming and Algorithms</td>
<td>Henrik Nagel (<a href="mailto:henrik.nagel@ntnu.no">henrik.nagel@ntnu.no</a>)</td>
</tr>
<tr>
<td>Sep 12</td>
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<td>~4hrs</td>
<td>L10</td>
<td>OpenMP part 3. OpenMP for GPU, with exercises. (C)</td>
<td>John Floan (<a href="mailto:john.floan@ntnu.no">john.floan@ntnu.no</a>)</td>
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