

Parallel Programming Project

Master HPC-AI

2023-2024

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Due to December 15th 2023

Project objectifs :

- MPI Parallelisation of the dense matrix-vector product implemented in TP2/densemv_mpi.cpp
- MPI Parallelisation of the sparse matrix-vector product implemented in TP2/sparsemv.cpp : you have to create a new file sparsemv_mpi.cpp and complete the CMakeFiles.txt to compile this new file
- Realize a benchmark with the matrix sizes $n_x = 50, 100, 150$ and 200 for a number of cores $n_p = 1, 2, 4, 8, 12, 16$ and 24 . The benchmark should be realized with the submission scripts run. The enclosed script should be modified with the project path, and executable names. The loop on the matrix sizes n_x and the number of cores n_p are already written in the script.
- The performance results of the tests should be gathered in a 2 pages benchmark report including executing time tables, performance and speed up curves, and the description of the tests.
- Parallelisation of the median filter in TP4 : use OpenMP and TBB. Be carefull on domain boundaries and overlap problems.
- Parallelisation of the live-of-boids project with OpenMP, TBB in ParallelProgrammingCourse/Projects/LiveOfBoids
- Realize a benchmark for a number of cores $n_p = 1, 2, 4, 8, 12, 16$ and 24 . The benchmark should be realized with the submission scripts run.

Send me by mail before December 15st 2021 :

- the benchmark report,
- commit and push developpement in a branch dev-mshpcai-2023- login where login is your github login
- the path on the cluster of your project.

If you have any problem or questions, send me a mail explaining your problem and attaching the log files with your problems.