Parallel Programming Project

Master HPC-AI

2024-2025

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Due to December 15th 2023

Project objectifs :

- 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 nx = 50, 100, 150 and 200 for a number of cores np = 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 nx and the number of cores np 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 densemv in TP2 with tasks: use OpenMP and TBB, complete the DenseMatrix class functions omptaskmult(), omptilemult(), tbbrangemult(), tbbrange2dmult() in DenseMatrix.h

- Parallelisation of the live-of-boids project with OpenMP, TBB in ParallelProgrammingCourse/Projects/LiveOfBoids

- Realize a benchmark for a number of cores np = 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 2024 :

- 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.