

CDA5125 Group Term Project information

(Spring 2022)

1. Important dates:

- 02/28-03/05 (week 8): discussing project ideas with the instructor
- 03/07: project proposal due. Feedbacks will be given in the week.
- 03/11: project scope finalized, project github site setup
- 03/25: project progress report 1
- 04/08: project progress report 2
- 04/18-04/22: project presentation
- 04/22: final project report due.

2. Project information

2.1 Group Size: up to 2 people.

2.2 Project site: You are required to use a github site to document the progress of your project, and maintain a log file recording major activities in the project. The site should be open to the instructor.

2.3 Examples of project types include, but not limited to, (1) development project, (2) evaluation project, (3) survey project, (4) research project.

2.3.1 Development project: In a software development project, one would apply what is learnt in CDA5125 to optimize or parallelize an application, a kernel, a library routine. Ideally, you should select the application, the kernel or the library routine that you are already familiar with to minimize the project overhead. You should also evaluate the performance of your software (and compared with other people's implementation if available). Example: an efficient sparse matrix to vector multiply routine for multiple-core SMP, a distributed sparse matrix to vector multiply routine for the cluster environment, a GPU algorithm from a recent paper.

2.3.2 Evaluation project: In an evaluation project, you may evaluate and compare different libraries or implementations of some functionality and compare their performance or evaluate a piece of software on different platforms. For example, you may compare different VM/container management systems for HPC applications. Make sure that you have the platforms to perform the evaluation and that the scope is sufficient large, but not too large for a course project.

2.3.3 Survey project: In a survey project, we will survey an area related to parallel and distributed computing. *For a survey project, you group must survey at least 8 related papers.* You will need to

narrow down the scope of the survey so that your survey can give a good overview of the area. Example: survey existing algorithms for distributed sparse matrix to vector multiply; survey authentication issues and schemes in the cloud computing environment.

2.3.4 Research project: In a research project, you will develop something (algorithm, program) beyond the state of the art, perform experiments to reveal something beyond the state of the art, evaluate something in an environment that it has not been evaluated before. Examples include designing a new interconnect topology, a new all-reduce algorithm that works well under some practical situations, a new job scheduling algorithm that eliminates network contention.

- 3 Grading: Grading will be based on participation as well as the following components.
- project proposal
 - progress reports
 - project presentation (final week of the class)
 - project report
 - project software if appropriate