
CS 6220: DATA SPARSE MATRIX COMPUTATIONS

The project report: The final project report should summarize your investigation. This means discussing and presenting the algorithms and applications, summarizing and interpreting the relevant theoretical results, and presenting your experimental exploration. The specific format and flow of the document is up to you, but it does need to address the required components of the project in a clear and professional manner. To provide some guidance, I have outlined the key criteria by which it will be graded (in no particular order, and essentially the key components of the project); though, this is not an exhaustive list. Since each project differs in its relative composition of applications, theory, and algorithms, part of your responsibility is determining the best way to present your results. If you have any questions or would like to discuss what to include in your report, please let me know and we can chat about it.

- **Application:** The report should provide an overview and description of the application area you have chosen to focus on, or, in the case of a more theoretical or implementation driven project, an overview of the potential/typical application areas relevant to your project. If you are testing your implementation on a simplified version of your application, it is still a good idea to present the full application and then discuss the simplifications made for the project. Alternatively, if your project is more theory heavy, you could discuss the potential applications and the gaps between the theory and a practical application/implementation.
- **Implementation:** As noted in the project assignment, you should turn in any code either in a compressed folder or as a pointer to an online repository. However, the report needs to describe the implementation, validate its correctness, and explore its behavior. This means designing and testing simple problems to ensure that your implementation behaves correctly and reporting the results. Depending on how implementation focused your project is, you can then test the limits of your implementation and test performance on your application. There may be simplifications you made to the general algorithms for your implementation, or natural extensions to your implementation that would improve performance. These could make for a good line of discussion, acknowledging and discussing ways to improve what you have done.
- **Theory:** This portion of the report should include a discussion of the theory relevant to your topic. If you are looking at a single algorithm, this could be a review and discussion of the relevant theoretical justification for its use. In a more implementation and application driven project you could then compare the expected or guaranteed performance with what you observe experimentally. If there is a lack of theory that is okay to discuss as well, what is known and what is lacking. If your project is more theoretical in nature, this section will contain more discussion of the theoretical aspects of an algorithm, perhaps including sketches of the key proofs or ideas behind the developments. If you are surveying several papers it may be interesting to compare their results, or lay out the evolution of the theory in the field.
- **Presentation:** This is an important part of the project, and it is worth taking the time to ensure that your report is well presented. This means that the report should be clearly formatted and written, provide the appropriate references, and logically structured. For example, pay attention to readability of plots, clarity of prose, and the order of material.

Remember that the project is due in pdf form via CMS by **1:00 PM on May 24, 2020**. If you have supplementary material relevant to your project, e.g. a video, audio files, etc. that you would like to submit there will be the option to upload a compressed archive file (.zip, .tar, etc.). If you have a supplemental file too big for CMS let me know and I will share a way you can turn things in via Cornell Box.