St. Francis Xavier University
Department of Computer Science

CSCI 554: Matrix Computation
Written Report and Presentation
Winter 2022

The written report and presentation are the major assessments of this course. These assessments consist of three components: a topic proposal, the report itself, and the brief presentation on the report. All three components are individual submissions.

The topic proposal is worth a total of 10% of your final grade. The report component is worth a total of 30% of your final grade. You must complete both components in order to pass the course. The brief presentation is worth a total of 10% of your final grade.

Do not leave these assessments until the last minute! Start as soon as possible!

Topic Proposal

Due March 17, 2022 in lecture

The topic proposal is a short document meant to introduce the reader to your chosen paper/result. Your topic proposal should include, at a minimum, the following information: your chosen paper/result, one or two paragraphs outlining the big ideas you plan to discuss in your report, a broad outline of the structure of your report (e.g. sections, subsections, etc.), and 2–3 preliminary references. (This reference list should, of course, include your chosen paper. Existing survey articles and textbooks are also great preliminary references for further reading. If you need pointers to such preliminary references, let me know and I can try to help.)

Your topic proposal should be a 1–2 page double-spaced document written in 12-point text. It will be marked in terms of completeness and organization.

Report

Due April 14, 2022 in lecture

The report is a review-style article summarizing the results of your chosen paper and making them accessible to a non-expert audience. Your report should introduce your chosen topic, present clear definitions, review the main results in the paper, and provide all necessary references. If you mention important theorems or results, you do not need to include the proofs as well, though you can provide proof sketches/summaries to aid in understanding.

Your report should be a 5–10 page double-spaced document written in 12-point text. Your report should also include full references to papers, books, and other literature that you use. The references do not count toward the page limit, so feel free to include as many references as you need.

Your report will be marked in terms of three broad categories: quality (e.g., focused on topic, good number of relevant references), accuracy (e.g., correct summary of main results, material all related to topic), and organization (e.g., good report structure, polished writing, ease of reading).

Lastly, remember that *quality is better than quantity.* A very well-written 5 page report that covers everything you want to discuss from your chosen paper is better to read than a disorganized, messy 10 page report that touches on anything even remotely related to your topic.

Presentation

Due date varies (last ∼2 weeks of lectures)

In the presentation component, you will give a short talk to your peers in the class to present your chosen paper and summarize the main results from your report. The purpose of this presentation is to share with others what you learned from your chosen paper; it does not need to be as detailed as a full lecture, but it should also not be a simple recitation directly from your report.

You should aim for your presentation to take around 10–15 minutes. Be sure to allocate time for setup (if needed) and questions at the end.

There is no mandatory submission for the presentation component, but if you use slides during your presentation, please submit a copy of the slides with your report.

Your presentation will be marked in terms of delivery, quality, and organization. Peer reviews submitted by other students will constitute a portion of your mark. Conversely, you will be expected to submit a peer review for every other student's presentation, and submitting these peer reviews will also constitute a portion of your mark.

Suggested Topics

The focus of your report/presentation should be on a recent research result in the area of matrix computation. (Note that it should relate to *matrix computation* and not to the more general *numerical analysis*!) Below, I offer a (non-comprehensive) selection of venues where you can find recent results and papers. You do not have to choose your paper from this list; these are only some ideas. You are welcome to study and write about a paper related to this course that was not obtained from some venue on this list.

If you need to obtain a paper but it is behind a paywall, let me know and I will likely be able to access it.

- **Journals**
  - ACM Transactions on Mathematical Software
  - Advances in Computational Mathematics
  - Journal of Computational and Applied Mathematics
  - Numerical Linear Algebra with Applications
  - SIAM Journal on Matrix Analysis and Applications
- **Conferences**
  - International Conference on Linear Algebra and its Applications (ICLAA)
  - International Conference on Matrix Analysis and Applications (ICMAA)
  - SIAM Conference on Applied Linear Algebra
- **Other**
  - arXiv "Mathematical Software" preprint repository (`arxiv.org/list/cs.MS/recent`)
  - arXiv "Numerical Analysis" preprint repository (`arxiv.org/list/cs.NA/recent`)
  - arXiv "Symbolic Computation" preprint repository (`arxiv.org/list/cs.SC/recent`)