Math/CS 714: Final project information

The final project is worth 40% of the total grade and is due at **5 PM CT on December 16.**[1] In general, the project should be completed in teams of up to three students. Projects with 2–3 students are preferred. Projects with $n \geq 4$ people will also be considered, but will require permission of the instructor and a statement detailing the division of the work. All team members will receive the same grade for the project.[2]

Topic

The final project should involve applying methods from the class to an application area of interest. The project should involve some coding, and purely theoretical projects will not be allowed.

It is fine (and in many cases encouraged) to take project ideas directly from existing research topics. However, in this case, the project should be based on aspect or direction that is carried out specifically for this course, as opposed to simply submitting ongoing or existing work.

Format and length

The table below gives a *very rough* guideline about the length of the final project write-up.

Team members	Pages
2	14
3	18
n	$\lfloor 9.5n^{0.6} \rfloor$

However, the precise length of the write-up is not important; the scientific content of the project is more important, and keeping your write-up concise and to-the-point is preferable.

Final project presentation

There is a final project presentation. These talks will be scheduled between December 9–11[3] in 1.5–2 hour sessions. The presentation will be in the style of a conference talk (10 minutes presentation plus 5 minutes of Q&A). Students will be required to attend the full session that they are scheduled within, and listen to the talks of their peers. Talks will be recorded and posted to Kaltura where they will be visible to course members only.

[1] Math/CS 714 does not have a final exam. But this time has been chosen to match when the final exam was scheduled. Since letter grades must be submitted to the university five days after this, there will be limited flexibility for extensions.

[2] In exceptional circumstances, grades may be assigned differently among team members.

[3] Exact dates will be finalized based on participant availability; please note that December 9 is a class day and will remain unchanged.

Project proposal – deadline November 7, 5 PM CT

To ensure the everyone starts off on the right track, each team must arrange a half-hour meeting with Yue or Chris, either in person or over Zoom. Only the meeting is required—it is not necessary to submit a written proposal.

Grade breakdown

The project will be graded out of 60 points. A complete breakdown is shown below.

- *Final Presentation (8%): 12 points*
  - **1 points** – Timing : presentation should stay within the allotted time. The point is automatically awarded if on time, deducted if overtime.
  - **4 points** – Structure and delivery: presentation should be organized, easy to follow, and concise. Visuals should be clear and support your main points.
  - **4 points** – Content accuracy and depth: demonstrates a solid understanding of the project topic; results and conclusions are correct and well-supported.
  - **3 points** – Responses to Q&As: answer questions accurately, thoughtfully, and demonstrate deeper understanding of the project.
- *Written report (20%): 30 points*
  - **6 points** – Project motivation and introduction: what problem are you trying to solve? What has been done before in this area? If appropriate, cite relevant books and papers.
  - **16 points** – Project methods and results: what mathematics and code did you develop for your problem? Where appropriate, did you consider mathematical analyses of your approach? Is the code that you developed correct?
  - **4 points** – Project conclusions: did you solve what you set out to do? What are possible limitations and problems with your approach? How you could you develop the project further?
  - **4 points** – Presentation and organization: writeup is clearly written with good spelling and grammar, follows a logical structure, and presents ideas in an organized manner. Figures and tables are clear and properly labeled.
- *Software (12%): 18 points*
  - **6 points** – Correctness: software runs without errors and produces the results reported in the write-up.
  - **8 points** – Functionality and design: code implements the project goals, demonstrates understanding of course concepts, and shows sophistication in design and implementation.
  - **4 points** – Readability: code should be well-organized and well-commented.