

CMSC 35300 Fall 2024

Project Guidelines

- The project must be done in two- or three-person teams by students taking CMSC 35300. Teams can be comprised of students from any section of the course, but all students must be enrolled in the CMSC 35300 version of the course.
- The project topic is open. Use your creativity. Straightforward application of a method from class to a new dataset is insufficient for full marks.
- Use the project as an opportunity to demonstrate what you learned *in this class*. Illustrating that you know how to use PyTorch or scikit-learn on some dataset would not get a high score, as it has little to do with this course.
- Think of the project like an extra-large homework, with roughly a commensurate amount of time invested. Please do not spend 80 hours on the project!
- The project has 120 points:
 - **Proposal [20 points]:** The proposal should include a description of the basic problem(s) to be considered and datasets to be studied (if any). The proposal should be about half a page. The purpose is for the instructors to get a sense of whether the project is overly ambitious or too small in scope to be eligible for full marks.
 - **Creativity [25 points]:** Are you pushing yourself to learn something new and go beyond class lectures?
 - **Literature Review [25 points]:** Explain how your project relates to other work in the area. Cite at least 1-2 papers you have read.
 - **Execution [50 points]:** How well you carried out the project. Is the problem clearly explained? Did you do a careful analysis or well-thought-out experiments? Have you clearly communicated your ideas?
- The final project report should be a 4-page NeurIPS-format paper; references can go beyond the 4th page. This means you must write it in LaTeX. We do not want/need to see your code, but that means that all of your process and analysis and evaluation must be clear from the text and the figures.
- **Proposal [20 points]** deadline is **Nov 15 at 11:59pm**.
- **Project [100 points]** deadline is **Dec 6 at 11:59pm**. There will be no reduction in points for late submissions, but grading starts on Dec 9 and anything not received by then will receive a grade of zero.
- Some ideas:
 - Distribution drift
 - Low-rank matrix completion methods
 - Non-negative matrix factorization

- Relevance vector machines
 - The LASSO, sparse coding, and/or ℓ_1 regularization
 - k-SVD
 - Collaborative filtering and recommender systems
 - PCA and autoencoder neural networks
 - (Stochastic) gradient descent and variants
- You may choose a project related to your own research, but it must also connect with topics *in this class* and demonstrate what you have learned about those topics.