15-400 Status Report 4
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1 Major Changes

There have not been any major changes to the project since the last meeting.

2 Accomplishments Since Last Meeting

Since the last meeting, I have identified an approach to robust matrix factorization to pursue. Key to this approach is a paper that my advisor wrote, called Robust Estimation via Robust Gradient Estimation. The key idea of this paper is that when solving an optimization problem where the data is noisy, rather than trying to change the loss function (for example, using M-estimators), we can view the gradient as a mean and run a robust mean estimation algorithm on the gradients. This is an interesting idea and is a shift in my perspective of how to solve the problem. I am currently implementing an approach that makes use of the ideas from this paper in a matrix factorization algorithm.

3 Meeting My Milestone

My planned milestone was to have developed a more thorough approach to robust matrix factorization and have started testing this approach on real-world data. I am currently implementing a promising approach and plan to test it on a real dataset within the next week.

4 Surprises

There have been no surprises to report so far.

5 Looking Ahead

Going forward, I plan to finish my implementation of the robust gradient approach and try it out on real-world data. My plan is to first try it on the original, unperturbed dataset, and then inject some malicious corruptions in the dataset and run the algorithm again. In addition, I will run a baseline matrix factorization algorithm on both datasets and compare the two approaches. My goal is to show that my approach is more robust than the baseline when corruptions are injected into the data.

6 Revisions to Future Milestones

I don’t believe that any revisions to future milestones are needed at this time.

7 Resources Needed

I have access to all of the resources I need for this project.