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 continued making progress on my implementation of my proposed approach to robust matrix factorization: an alternating minimization algorithm that uses robust gradient estimation. Furthermore, I have began developing a theoretical guarantee for the algorithm, with the goal of proving that no matter what the attacker does to the data, as long as the proportion of malicious data is relatively limited, the algorithm is guaranteed to get within a constant factor of the optimal solution.

3 Meeting My Milestone

My planned milestone was to have implemented an expanded approach that can perform well on real-world data. I would say I am slightly behind, since I do have an approach and am in the process of implementing it, but have not completed the implementation yet. One thing that I did not foresee when making the milestones was the part about showing a theoretical guarantee as well. My advisor recommended we attempt a proof of our algorithm because it deals with robustness. Experimental evidence that our algorithm handles one or two kinds of attacks is nice to see, but a proof will guarantee that the algorithm will perform well no matter what the attack is.

4 Surprises

There have been no surprises to report so far.

5 Looking Ahead

Going forward, I plan to complete my implementation of my robust matrix factorization approach and test it on real-world data, specifically the MovieLens datasets. In addition, I will further develop the structure of a theoretical guarantee for the algorithm and will have a sketch of the proof by the next meeting.

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.