15-400 Report 5

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1   Major Changes

Previously, my plan was to use all these local clustering algorithms as subroutine to a large recommender system, but these few weeks, our attention was focusing on experimenting these algorithms on their own, on some "hard" examples for traditional spectral methods. Therefore, I prioritized implementing these algorithms before adapting them into the whole system. This will also cause some schedule/goal changes.

2   Accomplishments

We finally get a working version of CRD algorithm, in addition, I have also finished a test version of vanillia random walk, which can be quickly modified into one of our testing algorithms, Nibble.

3   Meeting Milestones

Due to potential goal change, I didn't configure CRD into recommender system, but instead implementing another algorithm.

4   Surprises

Standard random walk method to find a good cut, which is first proposed by Lovasz and Simonovits in an effort to find volume of convex body, actually works poorly on our couterexample tree cross line graph. Previously, we expected it to beat spectral cut algorithm, since it seems to have more information and a more complicated dynamics than that algorithm, in the sense that it combines multiple eigenvectors. However, its performance was even worse than the standard spectral method.

5   Look Ahead

Before my regular Tuesday meeting with Gary, I will finish implementing the ACL algorithm and experimenting on that. Good news is ACL is a popular algorithm, so there are many codes I can find as references. Another algorithm is called evolving set, and I am contacting on an author of an experimental paper with this algorithm. However, he said he might not be able to locate the code since that's about 9 years ago. I might have to write it from scratch. Hopefully I can finish these two algorithms in next two weeks.

6 Revisions

Goal change: based on time, the project might change from "evaluating local algorithms in large recommender system" to "experimenting local algorithms on hard examples", in response to that, I will also implement several algorithms first and experiment them on certain graphs. If time permitted, I can also configure them into recommender system, and run experiments there.

7 Resources

Currently no such problems.