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Part I
Things done since last report

Presented the affiliation networks paper to others, solicited ideas. But more promising social-nework research topics have emerged apart from graph generation.

I have been reading papers related to these problems, acquired some datasets, and making further plans for experimentation and pursuing these ideas. Read these papers: 'Co-clustering documents and words using bipartitite spectral graph partitioning: Dhillon' and 'Clustering social networks: Trajan et al'. In one case, failed to get un-anonymized orkut data from authors.

1 Summary of research activities so far

Main activities have been: I studied the various temporal/ static, macro/ microscopic properties of network evolution. Then, I read about various network evolution models, their merits and demerits. Affilitation networks seem to be attracting much attention lately. From this context, it seems best to divert research towards exploring them (eg: co-clustering them) and their use in solving various problems in social network analysis (eg: in link prediction).

Part II
Ideas and questions

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2.1 Link prediction

Use microscopic evolution model here; or observe link formation statistics (degree distribution of new linkers etc..) and try to replicate these statistics while

making predictions.

credits: jhe~Ngdo~Ng.

2.1.1 Using affiliation networks

See if affiliation nw can be used to predict links. Maybe bias assigned to affiliation nw observations can be learned from using the corresponding social-nw evolution data.

credits: jhe~Ngdo~Ng, pratIka.

2.1.2 Experiments

Acquire data for evolving social networks, with corresponding affiliation networks. Perhaps Yin Zhang's students are trawling various social networking websites.

2.2 Partitioning/ clustering bi-partite graphs

Extend current graph partitioning algorithms to have soft clusters.

Try extending clustering algorithms by Brian and Trajan to co-cluster bipartitite graphs.

credits: pratIka.

2.3 Co-Clustering affiliation networks

credits: pratIka.

2.3.1 Ideas

- Use special properties of these networks to improve clustering.
- Try to use information from corresponding social network to better co-cluster the affiliation nw.

2.3.2 Actions

- Acquire affilation network data to experiment with: ones with community names.
- Consider previous work on co-clustering bipartite graphs.
- Consider previous work on clustering social networks in general. May give you ideas.

2.3.3 Experiments

- Try implementing the simple dhillon alg.
- Try applying the Trajan algorithm.
- Try the algorithm where ye cluster users and clusters by iteratively folding the affiliation nw to get user nw/ community nw and then using clusters in one nw to cluster the other nw.

2.4 Clustering nodes in social networks

Cluster nodes in social networks. Use special properties of these networks to improve clustering. Try to use affiliation nw here.

credits: pratIka.

3 Deferred research projects

Construct a graph generative model which, besides having good static and temporal properties displayed by graphs evolved using other models, also shows hierarchical community structure.

- Can you extend the affiliation networks model to do this?
- This can be done if the idea to use affiliation networks algorithm to generate clusters and then interconnect them works.

Given the k*k q(xhat, yhat) matrix, which specifies the edge densities between various node clusters, make a generative model which produces graphs with that clustering structure, such that it possesses various static and temporal properties of real world graphs.

- A trivial solution exists if the diagonal entries heavily dominate others. Is this well motivated?

Consider the problem of learning a decision tree with a 1/n correlated parity, given a noisy parity learner which only works with constant noise.

Part III
Suggested Plans

4 Administrativia

Take research course with Prof. Dhillon in fall.

5 Research

Pursue ideas and experimentation related to the use of affiliation networks in link prediction, and to the problem of co-clustering affiliation networks.

5.1 Data acquisition

Current data we have lacks group names: this makes it hard to evaluate clustering. Trying to get data with group names.

Get data for evolving social networks' snapshots with corresponding affiliation networks.

6 Feedback

Indrajita-AchArya mentioned a few papers which presented work related to co-clustering affiliation networks.

He acquiesced to our current lines of research in exploring link prediction and in co-clustering affiliation networks. He suggested that this can be my course-project, but in the meantime I must implement my ideas regarding generation of graphs with a particular cluster structure.

I was reprimanded for not implementing the above algorithm. My concern that there was insufficient motivation/ merit in executing this work was dismissed. My objection to the expectation for my implementing the algorithm on the grounds that it was not initially clear that I was to implement this was also dismissed.

The research course form was signed.

Part IV
Lessons and plan ahead

7 Criticism of the exchange

The professor, in insisting on my implementing the graph generation algorithm rather than immediately start work on the proposed new projects, and in doing so sternly, is clearly asserting his power over me.

I was nervous. I was unable to understand details in a certain technical conversation. This lapse was recognized.

Nervousness also prevented me from presenting the graph generation algorithm properly. I later wrote it out and showed it, after attempting analysis with pratIka.

During a later conversation, my lack of critical thinking was observed. I was unable to recall the shortcomings of the Kronecker product model and the microscopic network evolution model. On later thought, the latter is not

ameanable to mathematical analysis, while the former does not grow one node at a time.

Nervousness should have been overcome by solemnly recognizing that exchange of information/ expectations is the most important point of the meeting and determinedly focusing the intellect on it.

8 Action required

Alter communication strategy to eliminate nervousness in future meetings.

Promptly and quickly implement the algorithm and focus on important research.

Update new information about the professor in advisor hunt.