Influence Propagation Model for Clique-Based Community Detection in Social Networks

ABSTRACT

- In this paper, we address the problem of temporal interactionbiased community detection using a four-step process.
- First, we develop a partition approach using an objective function based on clique structure, to enhance the time efficiency of our methodology.
- Second, we develop an influence propagation model that gives greatest weight to active edges or to inactive edges in close proximity to active edges.
- Third, we develop expansion driven algorithms to efficiently find the activity-biased densest community.
- Finally, we verify the effectiveness of the extended mcommunity metric and the efficiency of the algorithms using three real data sets and a case study conducted on Twitter dynamic data set.

EXISTING SYSTEM

- Social media community detection is a fundamental challenge in social data analytics, in order to understand user relationships and improve social recommendations.
- Although the problem has been extensively investigated, the majority of research has been based on social networks with static structures.
- Our findings within large social networks, such as Twitter, show that only a few users have interactions or communications at fixed time intervals.
- Finding active communities that demonstrate constant interactions between its members comprises a reasonable perspective.
- Communities examined from this perspective will provide time-variant social relationships, which may greatly improve the applicability of social data analytics.

PROPOSED SYSTEM

- We include an objective function designed to partition the graph and improve the time efficiency for our model.
- The partition relies on balancing the load of data on the processors using clique structure. Adding the partition phase to our approach gives a significant improvement in time cost for the model.
- We evaluate the efficiency of our partitioning approach using three data sets: Twitter, Facebook, and Amazo.
- However, this time we compare the efficiency of the influence propagation model with and without partitions, using objective functions.
- We conduct a case study, using a dynamic data set from Twitter, to evaluate our approach by tracking changes in the detected communities over eight time intervals.

HARDWARE REQUIREMENTS

- Processor - Pentium –III
- Speed - 1.1 Ghz
- RAM - 256 MB(min)
- Hard Disk - 20 GB
- Floppy Drive - 1.44 MB
- Key Board - Standard Windows Keyboard
- Mouse - Two or Three Button Mouse
- Monitor - SVGA

SOFTWARE REQUIREMENTS

- Operating System : Windows 8
- Front End : Java /DOTNET
- Database : Mysql/HEIDISQL

CONCLUSION

- In this paper, we propose an approach to detect temporally active and dense communities, making use of the biased density metric and the influence of active users with the frequency of their interactions with the neighborhood.
- We argue that weakly connected edges in the network are important.
- They may have only a small influence at the current time, but, particularly if they are part of a time-evolving and dynamic local community and not a static one, may gain importance later: in other words, they may become active after a certain time if their neighborhood nodes are highly interactive.
- Therefore, we redefine the "active edges" and propose an influence propagation model to determine the potential weight of an edge.

REFERENCE

[1] Sensis. (Jun. 2016). *Sensis Social Media Report 2016: How Australian People and Businesses are Using Social Media*. [Online]. Available: www.sensis.com.au/asset/PDFdirectory/Sensis_Social_Media_Report_2016.PDF

[2] A. Java, X. Song, T. Finin, and B. Tseng, "Why we twitter: Understanding microblogging usage and communities," in *Proc. ACM 9th WebKDD 1st SNA-KDD Workshop Web Mining Soc. Netw. Anal.*, 2007, pp. 56–65.

[3] A. Clauset, M. E. J. Newman, and C. Moore, "Finding community structure in very large networks," *Phys. Rev. E, Stat. Phys. Plasmas Fluids Relat. Interdiscip. Top.*, vol. 70, no. 6, p. 066111, 2004.

[4] V. D. Blondel, J.-L. Guillaume, R. Lambiotte, and E. Lefebvre, "Fast unfolding of communities in large networks," *J. Stat. Mech., Theory Experim.*, vol. 2008, no. 10, p. P10008, 2008.

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[5] M. Rosvall and C. T. Bergstrom, "Maps of random walks on complex networks reveal community structure," *Proc. Nat. Acad. Sci. USA*, vol. 105, no. 2, pp. 1118–1123, 2008.

[6] U. N. Raghavan, R. Albert, and S. Kumara, "Near linear time algorithm to detect community structures in large-scale networks," *Phys. Rev. E, Stat. Phys. Plasmas Fluids Relat. Interdiscip. Top.*, vol. 76, no. 3, p. 036106, 2007.

[7] M. E. J. Newman, "Finding community structure in networks using the eigenvectors of matrices," *Phys. Rev. E, Stat. Phys. Plasmas Fluids Relat. Interdiscip. Top.*, vol. 74, no. 3, p. 036104, 2006.