

5. CONCLUSIONS

In this paper, we solved the problem of finding opinion based community, which is a new concept that requires to study community detection with opinion mining together. We introduced the People-Opinion-Topic (POT) model, which is an LDA based graphical model. We show how POT is useful to detect people's interests, opinion simultaneously. We also introduced a new opinion summary framework that is a community oriented opinion summary framework. The framework is useful when studying public opinions towards certain topics, products, services from different groups of people. However, the opinion based community detection is a new concept in this research area and it is still in its infancy. More work still needs to be done in the future work.

Acknowledgements

This work is partially supported by ARC Discovery Early Career Researcher Award (Grant No. DE160100308) and ARC Discovery Project (Grant No. DP160104075 and Grant No. DP170103954)". The authors would also like to thank the anonymous referees for their valuable comments and helpful suggestions.

6. REFERENCES

- [1] D. M. Blei, A. Y. Ng, and M. I. Jordan. Latent dirichlet allocation. *Journal of machine Learning research*, 3(Jan):993–1022, 2003.
- [2] W. Deitrick and W. Hu. Mutually enhancing community detection and sentiment analysis on twitter networks. *Journal of Data Analysis and Information Processing*, 1:19–29, 2013.
- [3] Z. Hu, C. Wang, J. Yao, E. P. Xing, H. Yin, and B. Cui. Community specific temporal topic discovery from social media. *CoRR*, abs/1312.0860, 2013.
- [4] Z. Hu, J. Yao, B. Cui, and E. Xing. Community level diffusion extraction. In *Proceedings of the 2015 ACM SIGMOD International Conference on Management of Data*, pages 1555–1569. ACM, 2015.
- [5] B. Liu and L. Zhang. A survey of opinion mining and sentiment analysis. In *Mining text data*, pages 415–463. Springer, 2012.
- [6] M. McPherson, L. Smith-Lovin, and J. M. Cook. Birds of a feather: Homophily in social networks. *Annual review of sociology*, pages 415–444, 2001.
- [7] M. E. Newman and M. Girvan. Finding and evaluating community structure in networks. *Physical review E*, 69(2):026113, 2004.
- [8] S. Parthasarathy, Y. Ruan, and V. Satuluri. Community discovery in social networks: Applications, methods and emerging trends. In *Social network data analytics*, pages 79–113. Springer, 2011.
- [9] J. Shi and J. Malik. Normalized cuts and image segmentation. *IEEE Transactions on pattern analysis and machine intelligence*, 22(8):888–905, 2000.
- [10] D. Wang, J. Li, K. Xu, and Y. Wu. Sentiment community detection: exploring sentiments and relationships in social networks. *Electronic Commerce Research*, pages 1–30.
- [11] X. Wang, N. Mohanty, and A. McCallum. Group and topic discovery from relations and text. In *Proceedings of the 3rd international workshop on Link discovery*, pages 28–35. ACM, 2005.
- [12] H. Yin, B. Cui, L. Chen, Z. Hu, and Z. Huang. A temporal context-aware model for user behavior modeling in social media systems. In *Proceedings of the 2014 ACM SIGMOD international conference on Management of data*, pages 1543–1554. ACM, 2014.
- [13] H. Yin, B. Cui, X. Zhou, W. Wang, Z. Huang, and S. Sadiq. Joint modeling of user check-in behaviors for real-time point-of-interest recommendation. *ACM Transactions on Information Systems (TOIS)*, 35(2):11, 2016.
- [14] H. Yin, Z. Hu, X. Zhou, H. Wang, K. Zheng, N. Q. V. Hung, and S. W. Sadiq. Discovering interpretable geo-social communities for user behavior prediction. In *ICDE*, pages 942–953, 2016.
- [15] H. Yin, X. Zhou, B. Cui, H. Wang, K. Zheng, and Q. V. H. Nguyen. Adapting to user interest drift for poi recommendation. *IEEE Transactions on Knowledge and Data Engineering*, 28(10):2566–2581, 2016.
- [16] Z. Yin, L. Cao, Q. Gu, and J. Han. Latent community topic analysis: integration of community discovery with topic modeling. *ACM Transactions on Intelligent Systems and Technology (TIST)*, 3(4):63, 2012.
- [17] Y. Zhu, X. Yan, L. Getoor, and C. Moore. Scalable text and link analysis with mixed-topic link models. In *Proceedings of the 19th ACM SIGKDD international conference on Knowledge discovery and data mining*, pages 473–481. ACM, 2013.