DYNAMIC RUMOR INFLUENCE MINIMIZATION WITH USER EXPERIENCE IN SOCIAL NETWORKS.

Ms. P. Kavyasree[1]
3rd Year Student,
Department of Computer Science,
SV U CM & CS, Tirupati.

Prof. Sridevi[2],
Professor,
Department of Computer Science,
SV U CM & CS,, Tirupati.

ABSTRACT:

With the soaring development of large scale online social networks, online information sharing is becoming ubiquitous every day. Various information is propagating through online social networks including both the positive and negative. In this paper, we focus on the negative information problems such as the online rumors. Rumor blocking is a serious problem in large-scale social networks. Malicious rumors could cause chaos in society and hence need to be blocked as soon as possible after being detected. In this paper, we propose a model of dynamic rumor influence minimization with user experience (DRIMUX). Our goal is to minimize the influence of the rumor (i.e., the number of users that have accepted and sent the rumor) by blocking a certain subset of nodes. A dynamic Ising propagation model considering both the global popularity and individual attraction of the rumor is presented based on realistic scenario. In addition, different from existing problems of influence minimization, we take into account the constraint of user experience utility. Specifically, each node is assigned a tolerance time threshold. If the blocking time of each user exceeds that threshold, the utility of the network will decrease. Under this constraint, we then formulate the problem as a network inference problem with survival theory, and propose solutions based on maximum likelihood principle. Experiments are implemented based on large-scale real world networks and validate the effectiveness of our method.

Index Terms—*Social network, rumor blocking, survival theory.*

INTRODUCTION:

Most of the previous works studied the problem of maximizing the influence of positive information through social networks. Fast approximation methods were also proposed to influence maximization problem In contrast, the negative influence minimization problem has gained much less attention, but still there have been consistent efforts on designing effective strategies for blocking malicious rumors and minimizing the negative influence, Introduced the notion of a "good" campaign in a social network to counteract the negative influence of a "bad" one by convincing users to adopt the "good" one of minimizing the propagation of malicious rumors by blocking a limited number of links in a social network. They provided two different definitions of contamination degree and proposed corresponding optimization algorithms. Investigated the least cost rumor blocking problem in social networks. They introduced the concept of "protectors" and try to select a minimal number of them to limit the bad influence of rumors by triggering a protection cascade against the rumor cascade. However, there are a few limitations in those works. First, they consider the rumor popularity as constant during the whole propagation.

Disadvantages:

1. They consider the rumor popularity as constant during the whole propagation process, which is not close to the realistic scenarios.

2. In the design of the rumor blocking strategies, either blocking nodes or links, they fail to take into account the issue of user experience in real world social networks.

METHODOLOGY

Investigate the problem of dynamic rumor influence minimization with user experience. First, based on existing works on information diffusion in social networks, we incorporate the rumor popularity dynamics in the diffusion model. We analyze existing investigations on topic propagation dynamics and busty topic patterns. Then we choose Chi-squared distribution to approximate the global rumor popularity. Inspired by the novel energy model proposed we then analyze the individual tendency towards the rumor and present the probability of successful rumor propagation between a pair of nodes. Finally, inspired by the

concept of Ising model, we derive the cooperative succeeding probability of rumor propagation that integrates the global rumor popularity with individual tendency. After that, we introduce the concept of user experience utility function and analyze the impact of blocking time of nodes to the rumor propagation process. We then adopt the survival theory to explain the likelihood of nodes getting activated, and propose both greedy and dynamic algorithms based on maximum likelihood principle.

Advantages:

1. Combine all three factors topic dynamics, Individual tendency and acceptance probability together to propose a cooperative rumor propagation probability

2. Blocking method optimizes the rumor blocking strategy without sacrificing the online user experience.

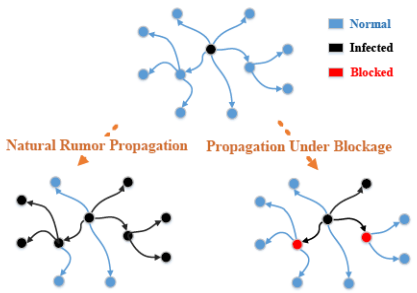
Modules:

Rumor propagation model: Taking into account the following three elements: First, the global popularity of the rumor over the entire social network, i.e., the general topic dynamics. Second, the attraction dynamics of the rumor to a potential spreader, i.e., the individual tendency to forward the rumor to its neighbors. Third, the acceptance probability of the rumor recipients. In our model, inspired by the Ising model, we combine all three factors together to propose a cooperative rumor propagation probability.

Rumor blocking strategies: We consider the influence of blocking time to user experience in real world social networks. Thus we propose a blocking time constraint into the traditional rumor influence minimization objective function. In that case, our method optimizes the rumor blocking strategy without sacrificing the online user experience.

Survival theory: Analyze the likelihood of nodes becoming activated or infected by the rumor before a time threshold which is determined by the user experience constraint. Then we propose both greedy and dynamic blocking algorithms using the maximum likelihood principle.

Architecture:



CONCLUSION

In this paper, we investigate the rumor blocking problem in social networks. We propose the dynamic rumor influence minimization with user experience model to formulate the problem. A dynamic rumor diffusion model incorporating both global rumor popularity and individual tendency is presented based on the Ising model. Then we introduce the concept of user experience utility and propose a modified version of utility function to measure the relationship between the utility and blocking time. After that, we use the survival theory to analyze the likelihood of nodes getting activated under the constraint of user experience utility. Greedy algorithm and a dynamic blocking algorithm are proposed to solve the optimization problem based on different nodes selection strategies.

REFERENCES

[1] K. Bijlani, S. Chatterjee, S. Anand, "Concept Maps for Learning in a Flipped Classroom", IEEE Fifth International Conference on Technology for Education, pp. 57-60, 2013.

[2] A. C. Santana, J. H. Abdalla, D. J. Tito, L. F. Molinaro, "Experience Implementating Project Based Learning in Engineering with Focus on Soft Skills Acquisition", IEEE Multidisciplinar Engineering Education Magazine, pp. 27-34, 2010.

[3] J. L. Bishob, M. W. Verlerger, "The Flip Classroom: A Survey of Research", 120th ASEE Conference & Exposition, Atlanta, USA, 2013.

[4] Z. Xiaoxuan, G. Rong, "Games in PBL teaching for vocational school students: Take the course "The basic information technology" for an example", Consumer Communications and Networks, pp.100-103, 2011.

[5] F. N. Leite, H. A. Junior, E. S. Hoji, e W. B. Vianna, "Using Problem- Based Learning (PBL) in Technical Education", 12th Active Learning in Engineering Education Workshop, RS, Brasil, pp. 58-68, 2014.

[6] C. Bonwell, e J. Eison, "Active Learning: Creating Excitement in the Classroom", Higher Education Report, Jossey-Bass, D.C., 1991.

[7] P. Rongjiang, "Study on development of higher vocational school students' practical ability of entrepreneurship", Communication Software and Networks, IEEE 3rd International Conference, pp. 301-304, 2011.

[8] D. P. Ausubel, Acquisition and Retention of Knowledge: A Cognitive Perspective, Lisbon: Platano Publishing House, New York, 2003.

[9] J. D. Ward e C. L. Lee, "Review of Problem-Based Learning", Journal of Family and Consumer Science Education, 20(1), pp. 16-26, 2002.

[10] M. J. O'Grady, "Practical Problem Based Learning in Computer Education", Transaction on Computer Education,12(3), pp. 18-29, 2012.

[11] M. L. Dahms, "Problem Based Learning in Engineering Education", 12th Active Learning in Engineering Education. Brasil, pp.4-14, 2014.

[12] N. K. Pang e T. K. Yap, "The flipped classroom experience", Software Engineering Education and Training (CSEE&T), pp. 39-43, 2014.

[13] G. Li, Y. Ning, X. Yan e F. A. Juanjuan, "Study on the Application of Flipped Classroom Teachin in Higher Vocational Education", Computer Science & Education (ICCSE), pp. 819-823, 2015.

[14] H. Jonsson, "Using Flipped Classroom, Peer Discussion, and Just-in- Time Teaching to Increase Learning in a Programming Course", Frontiers in Education Conference (FIE), El passo, Texas, pp.1-9, 2015.

[15] S. W. Kim, M. G. Lee, "Validation of an evaluation model for learning management systems", Journal of Computer Assisted Learning, 24(4), pp. 284-294, 2008.

[16] K. Hirama, "Distance Education: A Challenge for Software Development Organizations", IEEE Latin America Transactions, pp. 1523-1529, 2014.

[17] A. Hervas, F. B. Garcia, "Penalvo, F.J.G. A method of assessing academic learning experiences in virtual learning environments", IEEE Latin America Transactions, pp 219-226, 2014.

[18] J. Shan, "Desing of an Online Learning Platform with Moodle", Computer Science & Education (ICCSE), pp. 1710-1714, 2012.

[19] R. A. Wahab, F. Ali, S. Thomas, H. Al Basri, "Students' Perceptions of Moodle at the CHS. E-Learning Best Practices in Management, Design and Development of e-Courses: Standards of Excellence and Creativity", Fourth International Conference, pp. 97-101, 2013.

[20] A. Maron, L. Visintin e L, A. Abeijon, "Relation between polling and Likert-scale approaches to eliciting membership degrees clarified by quantum computing", IEEE Conference on Fuzzy Systems,pp. 1-6, 2013.

[21] L. Bardin, Análise de conteúdo. Lisboa, (ed.) 70, 2010.

Authors Profile

P KAVYA S received Bachelor of Computer Science degree from Sri Krishnadevaraya University, Anantapur in the year of 2013-2016. Pursuing Master of Computer Applications from Sri Venkateswara University, Tirupati in the year of 2016-2019. Research interest in the field of Computer Science in the area of Social networks,.Rumour blocking and survival Theory.

Dr. Mooramreddy Sreedevi, She is Working as a Senior Assistant Professor in the Dept. of Computer Science, S.V.University, Tirupati since 2007. She obtained her Ph.D. Computer Science from S.V.University, Tirupati. She acted as a Deputy Warden for women for 4 years and also acted as a Lady Representative for 2years in SVU Teachers Association, S.V.University, Tirupati. She Published 40 research papers in UGC reputed journals, Participated in 32 International Conferences and 46 National conferences. She acted as a Resource person for different universities. Her current research focuses in the areas of Network Security, Data Mining, Cloud Computing and Big data analytics.