CE7490 Project: Benchmarking Algorithms for Weight Prediction in Weighted Signed Networks

Ruihang Wang
School of Computer Science Engineering
Nanyang Technological University
ruihang001@e.ntu.edu.sg

Meng Shen
School of Computer Science Engineering
Nanyang Technological University
meng005@e.ntu.edu.sg

Yihang Li
School of Electrical and Electronic Engineering
Nanyang Technological University
leah9704@gmail.com

Abstract

The abstract paragraph should be indented ½ inch (3 picas) on both the left- and right-hand margins. Use 10 point type, with a vertical spacing (leading) of 11 points. The word **Abstract** must be centered, bold, and in point size 12. Two line spaces precede the abstract. The abstract must be limited to one paragraph.

1 Introduction

[Context] A number of weighted signed networks (WSN) exist in our world while many of them are incomplete. The values for weights prediction are ...

[Existing Solutions] State-of-the-art fairness and goodness. Baselines: Reciprocal, Triadic balance, Triadic Status, Pagerank ....

[Our project] To better understand theories and master practical skills, we investigate and implement a common set of algorithms and evaluate their performance on real-world datasets.

The rest of the paper is structured as follows: Section 2 presents related work in this topic. Section 3 describes the overview of our project. Section 4 formulates the problem of weight prediction in weighted signed networks. Section 5 conducted experiments on real-world datasets using different algorithms. Section 6 evaluates the performance of all tested methods. The conclusion is summarized in Section 7.

2 Related Work

Edge Sign Prediction in SSNs ...

Edge Weight Prediction in Social Networks ...

3 Project Overview

In this project, we extensively investigate and experiment methods for edge weight prediction in weighted signed networks. All algorithms are tested and evaluated on published real-world datasets. Moreover, we try our best to improve the performance on some traditional methods. The finished works are summarized as follows:

1. Literature review on OSN and select a topic about predicting weight of edges for weighted signed network.
2. Investigate the state-of-the-art algorithms *fairness-goodness* in [ ] and studied a common set of baselines for weight prediction.
3. Conducted experiments on each algorithm and reproduce the results mentioned in original paper using real-world dataset.
   Experimental 1 - Removing one edge prediction : ...
   Experimental 2 - Removing N %-out edge prediction : ...
4. Evaluate results of different methods.

4 Problem formulation

5 Experiments implementation

Fairness and goodness

PageRank

Bias and deserve

Reciprocal

Signed HITS

Status theory

Triadic balance

Triadic status

Linear regression

6 Performance evaluation

7 Conclusion

References

References follow the acknowledgments. Use unnumbered first-level heading for the references. Any choice of citation style is acceptable as long as you are consistent. It is permissible to reduce the font size to `small` (9 point) when listing the references. **Remember that you can use more than eight pages as long as the additional pages contain *only* cited references.**

[1] Alexander, J.A. & Mozer, M.C. (1995) Template-based algorithms for connectionist rule extraction. In G. Tesauro, D.S. Touretzky and T.K. Leen (eds.), *Advances in Neural Information Processing Systems 7*, pp. 609–616. Cambridge, MA: MIT Press.

[2] Bower, J.M. & Beeman, D. (1995) *The Book of GENESIS: Exploring Realistic Neural Models with the GEneral NEural SImulation System.* New York: TELOS/Springer–Verlag.

[3] Hasselmo, M.E., Schnell, E. & Barkai, E. (1995) Dynamics of learning and recall at excitatory recurrent synapses and cholinergic modulation in rat hippocampal region CA3. *Journal of Neuroscience* **15**(7):5249-5262.