June 20, 2017

To: Professor Jie Lu
Editor in Chief, *Knowledge-Based Systems*

Dear Professor Lu,

We would like to thank you for providing us with the opportunity to revise our paper for the third time (Bozorgi et al, "Community-based Influence Maximization in Social Networks under a Competitive Linear Threshold Model"). As per your suggestion, we have thoroughly revised our paper in response to the comments provided by the anonymous reviewers. Below is given descriptions of how we have addressed each of the reviewer comments.

Sincerely,
Arastoo Bozorgi, Saeed Samet, Johan Kwisthout, Todd Wareham

Reviewer #1

Comment #1: This is the third round of review for manuscript entitled "Community-based Influence Maximization in Social Networks under a Competitive Linear Threshold Model". Through its revision, the manuscript has been substantially improved and the authors have addressed some of other reviewers' comments. However, Regarding my comment "the main issues raised in connection with the experimental part of the paper are not sufficiently addressed. The comparisons and the analysis of results is not yet convincing. For instance, the method used for comparative purposes come from only Monte-Carlo simulation. Nevertheless, there are a lot of methods for influence maximization published in recent years, including 2016. The proposed approach needs to be validated in comparisons with such recent works."

No proper response was provided. I am still not convinced that some studies in 2003, 2010, 2013 can be state of the art works. There are a lot of methods for influence maximization published in recent years, including 2016. The proposed approach needs to be validated in comparisons with such recent works.

Answer: We thank the reviewer to remind us some points about our experiments. We remind again that the main purpose of our approach is to propose a new propagation model which is an extension of Linear Threshold model and enables the nodes to think about incoming influence spread for d time steps. The algorithm that we introduced in our paper is used to find the minimum number of nodes for second competitor and uses the community structure of the graph to improve the running time.

Therefore, comparing our approach with recent works which have introduced a heuristic algorithm to solve the influence maximization problem is not reasonable. To prove that we have stepped in the right path, we found some papers [1, 2, 3] published in 2016 which proposed a propagation model for competitive influence maximization problem. Ching Ou et al. stated in their paper [1] that "We do not aim to propose a better heuristic method to solve the NP-hard influence maximization problem" and they compared their approach with the following approaches:

- *Max-Weight* algorithm which chooses the seed with maximum outweight sum and is similar to HighDegree which we used in our comparisons.
- *Greedy* algorithm [4] which we used in our comparisons, too.
- *PageRank* algorithm [5] which is a based approach proposed in 1998.

Also, Pham et al. compared their approach [2] with *Max-Weight* and *Greedy*. Kermani et al. [3] proposed a framework that models a competitive influence maximization problem and considers some factors such as the user, message content, network topology and the influence model in their framework. They compare their approach with *Greedy* algorithm [4] and some other approaches which consider the factors they have considered in their work separately.

We have followed the same pattern in our experiments and to evaluate the efficiency of our approach, we have compared it with Greedy algorithm [4] which uses Monte Carlo (MC) simulations and random approach on real world datasets. Also, to track the effect of communities on algorithms results, we have done our experiments on synthetic datasets, too. Moreover, we have included a new set of experiments which consider the effect of the algorithm which finds the seed nodes for the first competitor on the seed nodes which will be selected by the second competitor. For these experiments, we have included INCIM [6] which was published in 2016, IPA [7] and LDAG [8]. The results included in these papers [6, 7, 8] show that they have achieved remarkable results in their experiments. None of the other papers consider such effects in their approaches and this is another innovation of our paper.

Reviewer #3

Comment #1: There are some mistakes in grammar. Please check it carefully.

Answer: We thank the reviewer for this corrections. We proofread the paper and we applied all the corrections to this version of the paper.

References

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[3] M. A. M. A. Kermani, S. F. F. Ardestani, A. Aliahmadi, F. Barzinpour, A novel game theoretic approach for modeling competitive information diffusion in social networks with heterogeneous nodes, Physica A: Statistical Mechanics and its Applications 466 (2017) 570–582.

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