Response to Reviewer Comments

Thank you for your time and consideration for our manuscript titled "Efficient Estimation of Betweenness Centrality in Wireless Networks (#MONE-D-15-00128).” While we appreciate the reviewer’s comment that our work makes significant contributions, as described below, we found many of the reviewer’s comments unclear or hard to agree upon. Anyway, we have done our best to revise our manuscript according to the reviewer comments.

**1. Reviewer’s comment: The contribution is significant, but more number of graphs are given in the paper. It is totally confused or difficult to follow. Some portions in the paper, example theorems and complexity analyses are difficult to understand.**

Our opinion: The reviewer does not mention what specific presentation problems our manuscript has and how the presentation of the manuscript can be improved. Does our manuscript have many grammatical errors or typos? Although we strove to develop succinct examples, do our examples look overly complicated? If so, how these examples can be simplified? Or, is our paper inappropriately organized? If so, how should we restructure the paper? As a side note, we have been publishing articles and reviewing papers for prestigious journals (IEEE Networks, IEEE JSAC, ACM TODS, IEEE TKDE) and conferences (SIGMOD, VLDB, ICDE). It seems to us that our manuscript has, compared to the aforementioned publications, similar presentation quality. Anyway, we read our manuscript carefully once again and revised it as follows:

1. The proof of Theorem 5 describing the complexity analysis was rewritten to make it easier to read.
2. Some errata were corrected (e.g., “Fig. 1 (c)” was corrected to “Fig. 2 (b)” and “N[1,…,u+w]” to “N[0,1,…,u+w]” in Section 3.2).

**2. Reviewer’s comment: The data set given in paper is taken from ref. 16 and it was published in 2009. Try for recent year data set or real time data analysis.**

Our opinion: We would like to point out that this data set is a very valuable resource which was obtained by capturing actual wireless nodes’ contact history in real settings (refer to http://crawdad.cs.dartmouth.edu/cambridge/haggle/20090529/imote/). For this reason, the data set is still popularly used in recent work such as:

1. Weixiong Rao, Kai Zhao, Yan Zhang, Pan Hui, and Sasu Tarkoma, "Towards Maximizing Timely Content Delivery in Delay Tolerant Networks," IEEE Transactions On Mobile Computing, Vol. 14, No. 4, pp. 755~769 APRIL 2015.
2. Kuan Zhang, Xiaohui Liang, Rongxing Lu, Kan Yang, and Xuemin (Sherman) Shen, "Exploiting Mobile Social Behaviors for Sybil Detection", in Proc. IEEE INFOCOM, pp.271-279, April 26 - May 1, 2015.

**3. Reviewer’s comment: Figure quality is also low. Provide the high quality images in figures 4 to 8.**

Our opinion: We currently do not understand this comment since our paper contains high resolution figures that were generated by Python scripts.

**4. Reviewer’s comment: Betweenness Centrality - the number of times a node acts as a bridge along the shortest path between two other nodes. Did you test the above statement in the result analysis.**

Our opinion: In Section IV. A and B, we calculated the betweenness centrality results that were obtained by simulating wireless networks according to the data sets mentioned above. And then, we also got the changes of correlation between the different betweenness results and depicted them in Figure 3 (a) and (b).

**5. Reviewer’s comment: Simulation setup: mobile or stable.In table 4, some mobile numbers are given and how will you perform location estimation. Since proper localization only support this work.**

Our opinion: As you mentioned, the simulation networks include many mobile nodes as well as static ones. However, the mobile nodes do not need their location information to calculate betweenness over logical social graphs. It is contact history information that they need to calculate it.

We would like to inquire if it is possible to have our manuscript re-evaluated and in case major revision is necessary, to receive concrete revision instructions.

We sincerely thank you for your time and consideration.