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Dear Editor,

We wish to submit an original research article entitled “An Induced Multi-Relational Framework for Answer Selection in Community Question Answer Forums” for consideration by Springer Data Mining and Knowledge Discovery. We confirm that this work is original and has not been published elsewhere, nor is it currently under consideration for publication elsewhere.

In this paper, we work on the task of identifying the best candidate answer to a question on Community Question Answer (CQA) forums. Earlier works evaluate each answer with its corresponding features in a supervised setting to identify the answer label (Accepted or not). However, we argue that an answer is adjudged "best" in relationship to other answers to the same question. Further, considering other answers to similar questions, as well as those from similar users in the forum, can provide cues to answer quality. Thus, in this work, we propose to incorporate the relational aspects of user-generated content (question and answers) in the forum via induced relational views (or graphs). We further develop graph convolutional operators to encode these semantically diverse views.

Specifically, we make three contributions. First, we introduce a modular framework that separates the construction of content graphs from the label selection mechanism. We use equivalence relations across content to induce graphs comprising cliques and enable two complementary label selection mechanisms; label contrast, and label sharing, via graph convolutional operators. Second, we show that encoding label contrast in this manner creates discriminative magnification, enhancing the separation between contrasting nodes in the latent representation space. Third, we show a surprising result---applying familiar boosting techniques across our content graphs outperforms the popular stacking, fusion, or aggregation methods for neural architectures. We show strong results over state-of-the-art neural baselines with extensive experiments across 50 StackExchange communities.

The most recent closely related contributions to our work are those that extends the GCN framework or use GCN for modelling application-specific graphs (mentioned in the related work too):

- Zhuang, C., Ma, Q.: Dual graph convolutional networks for graph-based semi-supervised classification. In: World Wide Web Conference’18
    - Dual relational graph modeling using GCN

- Schlichtkrull, M., Kipf, T.N., Bloem, P., van den Berg, R., Titov, I., Welling, M.: Modeling relational data with graph convolutional networks. In: European Semantic Web Conference. Springer'18
    - Another multi relational GCN approach
- Derr, T., Ma Y., and Tang J.: Signed graph convolutional networks. In: IEEE International Conference on Data Mining (ICDM)'18.
    - Extension of GCN to handle signed edges.

- Kipf, T.N., Welling, M.: Semi-supervised classification with graph convolutional networks. In: ICLR'16
    - The original GCN paper.

- Yu, B., Yin, H., Zhu, Z.: Spatio-temporal graph convolutional neural network: A deep learning framework for traffic forecasting.
    - Adaption of GCN for application-specific spatio-temporal graphs.

We have suggested the authors of recently published related work proposing extensions of GCN or handling multi relational graphs using GCN as potential reviewers in the application form. We have otherwise no conflicts of interest to disclose.

Please address all correspondence concerning this manuscript to me at knarang2@illinois.edu.

Thank you for your consideration of this manuscript.

Sincerely,

Kanika Narang