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Topic: **Metapath Aggregated Graph Neural Network for Graph Embedding and Efficient Community Search over Large Directed Graphs**

Abstract:

In this talk we examine two pieces of work related to graphs. The first work focuses on graph embedding with existing models usually define multiple metapaths in a heterogeneous graph to capture the composite relations and guide neighbor selection. However, these models either omit node content features, discard intermediate nodes along the metapath, or only consider one metapath. To address these three limitations, we propose a new model named Metapath Aggregated Graph Neural Network (MAGNN) to boost the final performance.

Our second work is on finding community in social graphs efficiently with index-based approach. Most existing works focus on undirected graphs which overlooks the rich information carried by the edge directions. Recently, the problem of community search over directed graphs (or CSD problem) has been studied; it finds a connected subgraph containing q, where the in-degree and out-degree of each vertex within the subgraph are at least k and l, respectively. However, existing solutions are inefficient, especially on large graphs. To tackle this issue, in this paper we propose a novel index called D-Forest, which allows a CSD query to be completed within the optimal time cost. We further propose efficient index construction methods to demonstrate its effectiveness.

Bio:

Prof. King's research interests include machine learning, social computing, AI, web intelligence, data mining, and multimedia information processing. In these research areas, he has over 300 technical publications in journals and conferences. He is an Associate Editor of the Journal of Neural Networks and ACM Transactions on Knowledge Discovery from Data (ACM TKDD). He is President of the International Neural Network Society (INNS) and an IEEE Fellow, Distinguished Member of ACM, and HKIE Fellow. Moreover, he is the General Co-chair of The WebConf 2020, ICONIP 2020, WSDM 2011, RecSys 2013, ACML 2015, and in various capacities in a number of top conferences such as WWW, NIPS, ICML, IJCAI, AAAI, etc. While he was on leave with AT&T Labs Research, San Francisco, he also taught classes as a Visiting Professor at UC Berkeley. He received his B.Sc. degree in Engineering and Applied Science from California Institute of Technology, Pasadena and his M.Sc. and Ph.D. degree in Computer Science from the University of Southern California, Los Angeles.