[ICLR 2019 Workshop] Can Graph Neural Networks Go "Online"? An Analysis of Pretraining and Inference. [paper]

Node/Graph Tasks: Node classification

Training Type: pre-training

Pretext task data: node labels
The pretext task here is the same as the downstreaming tasks, which is to classify nodes or predict the node labels.

Initial short summary here
In view that the traditional GNNs takes the whole graph structure that is already fully known as the input and it is yet less explored whether continuing the training process on unseen data is a valid approach for dealing with updates in the graph structure, this paper creates a dedicated experiment to evaluate inference capabilities of graph neural networks in the setting that unseen nodes and edges are inserted into the graph, which is similar to what happens in dynamic and large networks.

Specifically the work includes edges in the training set if and only if both its source and destination node are both in the training set. The training process is divided into two steps. First, the model is pre-trained on the labelled training set. Then the previously unseen nodes and edges are inserted into the graph and continue training fora limited amount of inference epochs. The accuracy is evaluated on the test nodes before and after each inference epoch. FOr each model, 200 pre-training epochs versus no pretraining are compared. In the latter case, the training begins during inference, which is equivalent to retraining from scratch whenever new nodes and edges are inserted. Results demonstrate that pretrained models consistently outperform non-pretrained models while having substantially less variance.

Bibtex:
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