先端科学技術研究科　修士論文要旨

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要旨

Prediction of edges between nodes in graph data is useful for many applications, such as social network analysis and knowledge graph completion.
Existing graph neural network-based approaches have achieved notable advancements, but encounter significant difficulty in building an effective model when there is an insufficient number of known edges in graphs.
Although some meta-learning approaches were introduced to solve this problem, having an assumption that the nodes of training graphs and test graphs are in homogeneous attribute spaces, which limits the flexibility of applications.
In this paper, we proposed a meta-learning method for edge prediction that can learn from graphs with nodes in heterogeneous attribute spaces.
The proposed model comprises two neural network-based components and a graph-specific linear layer adaptation.
The attribute-wise message-passing networks transform information in connecting nodes for each attribute to obtain attribute-specific node embeddings.
The node encoders aggregate the attribute-specific node embeddings to obtain attribute-shared node embeddings.
These two components are alternately performed, and shared in all graphs, by which we can transfer knowledge across different graphs.
The probabilities of edges are estimated by the Euclidian distance between final attribute-shared node embeddings.
Experimental results on 14 real-world data sets demonstrate that the proposed method outperforms existing approaches in edge prediction problems with sparse edge information.