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【既発表論文紹介】

Dual Graph Convolutional Networks for Graph-Based Semi-Supervised Classification

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How to make computers sufficiently understand a complex graph is an important task in a range of different fields. For instances, in the fields of the Internet, social networks, biological networks, and many others, more and more structured data is becoming available. As a result, it is interesting and necessary to devise advanced methodologies to extract meaningful data from these various graphs.

In this paper, we present a scalable graph convolutional networks method for graph-structured data analysis, and then apply it to solve the graph-based semi-supervised classification problem. To make computers sufficiently understand a graph, we proposed a dual graph convolutional networks method that performs graph convolution from two different views of the raw graph. Accordingly, two essential assumptions in graph convolution are jointly considered in our method: (1) local-consistency and (2) global-consistency. Specifically, the local-consistency assumes that nearby graph nodes are likely to have the same label, while the global-consistency assumes that graph nodes that occur in similar contexts tend to have the same label. Our dual graph convolutional method could transform a graph into different latent representations on the basis of these two assumptions. Given the different data transformations from the two convolutional networks, we then introduce an unsupervised temporal loss function for the ensemble.

To evaluate the utility of our method, we apply our method to do the graph-based semi-supervised classification. Experiments on a variety of public datasets illustrate the effectiveness of our method for solving classification tasks.

In a brief conclusion, our work provides a solution for learning graph latent representations from different views of raw data. In future work, we will seek more ways of understanding a graph. In other research, we will also investigate whether our method could be applied in research fields such as domain adaptation learning. The source and target domains' knowledge could be jointly embedded in our dual convolutional networks for adaptation.

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