Special Issue

How Graph Convolutional Networks Work: Mechanisms and Models

Message from the Guest Editors

Graph Convolutional Networks (GCNs) have been developed rapidly leading to the creation of diverse models in different fields, such as biomedicine, genetical analysis, and pattern recognition. GCNs are a type of deep learning model that operate on graph-structured data as they can capture the local structure of data and identify patterns and regularities in the data based on the tasks including node classification, graph classification, and link prediction. Moreover, GCNs can not only be used to learn node representations capturing the topology between the data, but can also be utilized as features for downstream tasks, like classification and clustering. However, various issues can be found in GCNs. First, it is not convenient to predict the unseen data since the designed graph only considers the correlation for the training data. Second, it needs to consume a lot of storage space to store the graph structure, making it important to consider the size of the graph. Third, it is important to consider the different kinds of data for specific tasks in homogeneous graphs or heterogeneous graphs.

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