Case ID:M22-100P^

Published: 10/10/2022

Inventors

Contact

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Systems and Algorithms for Few-Shot Node Classification on Graphs

-Background

Node classification in real-world attributed networks is a central analytical task that is a growing research area. In real-world networks, a large portion of node classes only contain limited labeled instances.

Many prevailing graph machine learning methods typically rely upon the availability of sufficient labeled data. However, the long-tail property of real-world graphs makes those methods less effective for learning new concepts when only limited data is available. A powerful graph machine learning model should be able to quickly learn never-before-seen class labels using only a handful of labeled data. Dealing with such few-shot concepts is important and has practical applications in a number of fields.

Invention Description

Researchers at Arizona State University have developed a novel algorithm and system designed for graph few-shot learning for different down-stream tasks, including node classification and anomaly detection. This system is able to perform meta-learning on an attributed network and derive a highly generalizable model for handling the target classification task. This system operates by constructing a pool of semi-supervised node classification tasks to mimic the real test environment.

Potential Applications

- Social network analysis
- Financial fraud detection
- Drug discovery

Benefits & Advantages

- Can operate with limited labeled data
- Demonstrated superior capability of few-shot node classification
- Robust and effective model for machine learning

Related Publication: Graph Prototypical Networks for Few-shot Learning on Attributed Networks