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Data-Efficient Graph Learning

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Abstract

The world around us -- and our understanding of it -- is rich in relational structure: from atoms and their interactions to objects and entities in our environments. Graphs, with nodes representing entities and edges representing relationships between entities, serve as a common language to model complex, relational, and heterogeneous systems. Despite the success of recent deep graph learning, the efficacy of existing efforts heavily depends on the ideal data quality of the observed graphs and the sufficiency of the supervision signals provided by the human-annotated labels, leading to the fact that those carefully designed models easily fail in resource-constrained scenarios. In this talk, I will present my recent research contributions centered around data-efficient learning for graph-structured data. First, I will introduce what data-efficient graph learning is and my contributions to different research problems under its umbrella, including graph few-shot learning, graph weakly-supervised learning, and graph self-supervised learning. Based on my work, I will elucidate how to push forward the performance boundary of graph neural networks as well as large language models on graph-structured data with low-cost human supervision signals.