

Federated Graph Neural Networks: Overview, Techniques and Challenges

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1. Abstract

In this paper, we bridge this gap by offering a comprehensive survey of this emerging field. We propose a unique 3-tiered taxonomy of the FedGNNs literature to provide a clear view into how GNNs work in the context of Federated Learning (FL).

本文提出了一种独特的 FedGNNs 文献的三层分类法，提供了一个关于GNN 在联邦学习(FL)环境中如何工作的清晰视角。

2.1. Terminology (专业术语)

- GNN
 - adjacency matrix: $A \in \mathbb{R}^{N \times N}$
 - 节点特征 node features: $\mathbf{X} \in \mathbb{R}^{N \times f}$
- FL
 - *clients*: data owners with sensitive local data
 - *server*: 协调 clients

值得注意的是 GNN 和 FL 中都有 Aggregation 这个概念

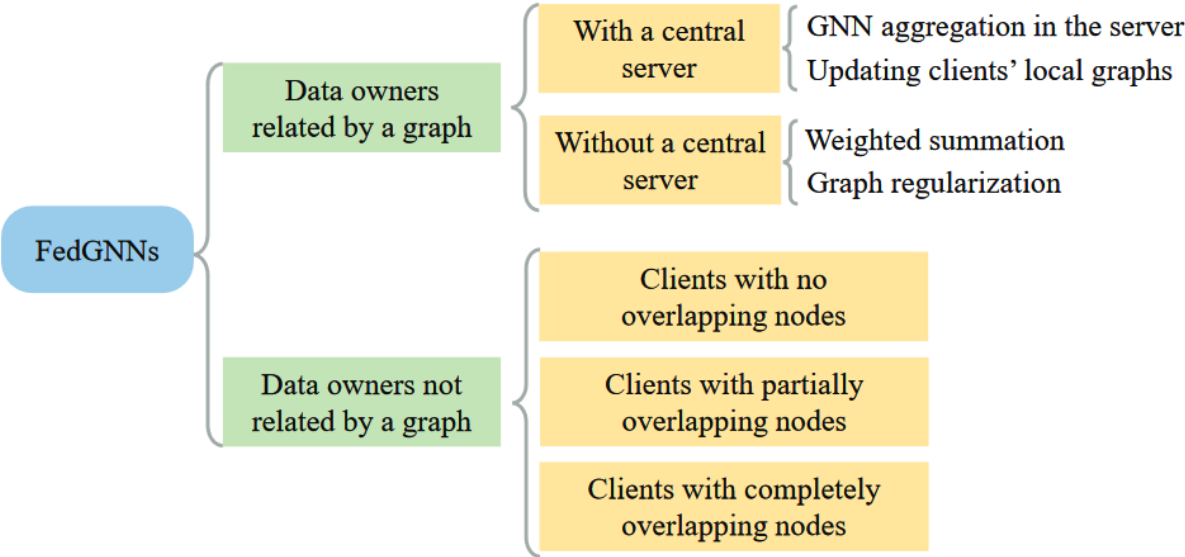
GNN Aggregation

- 给定一个节点，通过聚合其邻居节点的信息来更新它的嵌入, Aggregation 操作可以是 **mean, weighted average, or max/min pooling methods**

FL Aggregation

- 服务器（用某种算法，eg. **FedAvg**）根据数据拥有方的上传的本地模型参数去聚合更新全局模型的参数

2.2 The Proposed 3-Tiered FedGNN Taxonomy



上图就是此篇论文提出的三层分类法