

Paper Review – HOW POWERFUL ARE GRAPH NEURAL NETWORKS?

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- **What is the problem discussed in the paper?**

This paper has discussed that Graph Neural Networks are an effective framework for representing learning for graphs. Because of recursive aggregation and transformation of vectors of neighboring nodes has limited understanding of their representational properties and limitations. The paper explained that the popular GNN variants cannot be learned to distinguish simple graph structures.

- **Why is it important?**

It is important because GNN is a widely used algorithm in many applications like social media, biological sciences etc. Therefore, it is important to understand how the GNN and how the various popular variants of GNN like GCN, GrapSAGE works and understand the representation.

- **What are the main ideas of the proposed solution for the problem?**

The main idea of the proposed solution is that the authors have built an architecture that is probably the most expressive among the class of GNNs and is as powerful as the WL graph isomorphism test. By doing this, their model has achieved state-of-the-art performance.

- **What are the shortcomings of the proposed solution?**

One of the main drawbacks of this paper is it relies heavily on theoretical analysis and may not fully capture the complexity and nuances of real-world graph datasets. In addition, the proposed framework only considers the expressive power of GNNs and does not account for other important factors such as computational efficiency and scalability.