Understanding Graph Neural Networks (GNN) - Practical Perspectives

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Approach

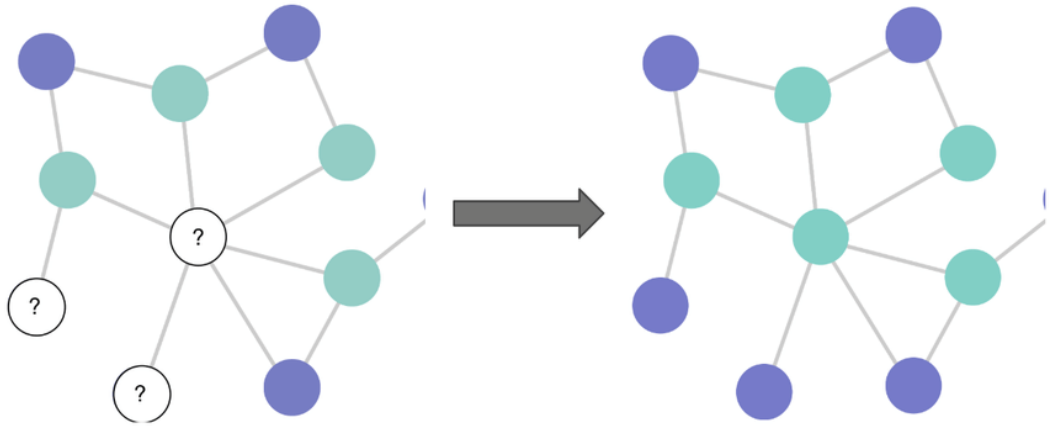
- Exploring GNN's and how can they be used for graph use cases
- Practical examples to demonstrate its concepts for
  - Node Prediction
  - Graph Classification
- Sample code, references will be shared after the session
- Thanks to the public datasets, well-document code references, the open community, pytorch, …TFUG Pune for the opportunity

What are GNN’s ? Quick Snapshot

- Graph Neural Networks (GNNs) are a class of deep learning methods designed to perform inference on data described by graphs.
- GNNs are neural networks that can be directly applied to graphs and provide an easy way to do node-level, graph-level, and edge-level prediction tasks.

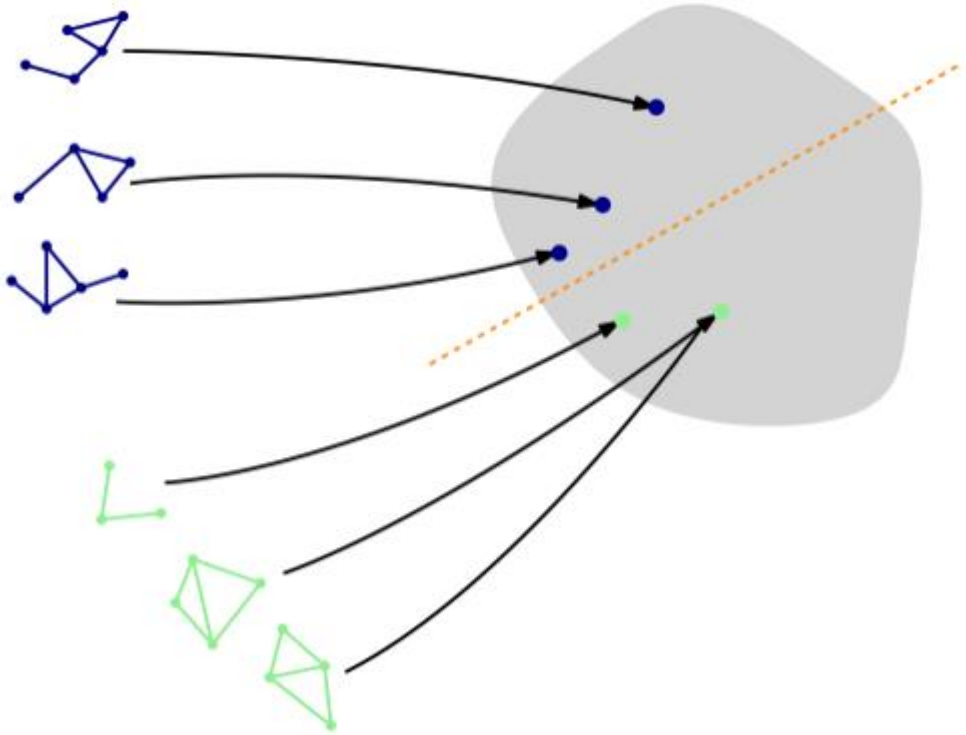
Kinds of Tasks for GNN ?

- **Node Prediction/Classification:**
  - The task here is to determine the labeling of samples (represented as nodes) by looking at the labels of their neighbors.
  - Usually, problems of this type are trained in a semi-supervised way, with only a part of the graph being labeled.



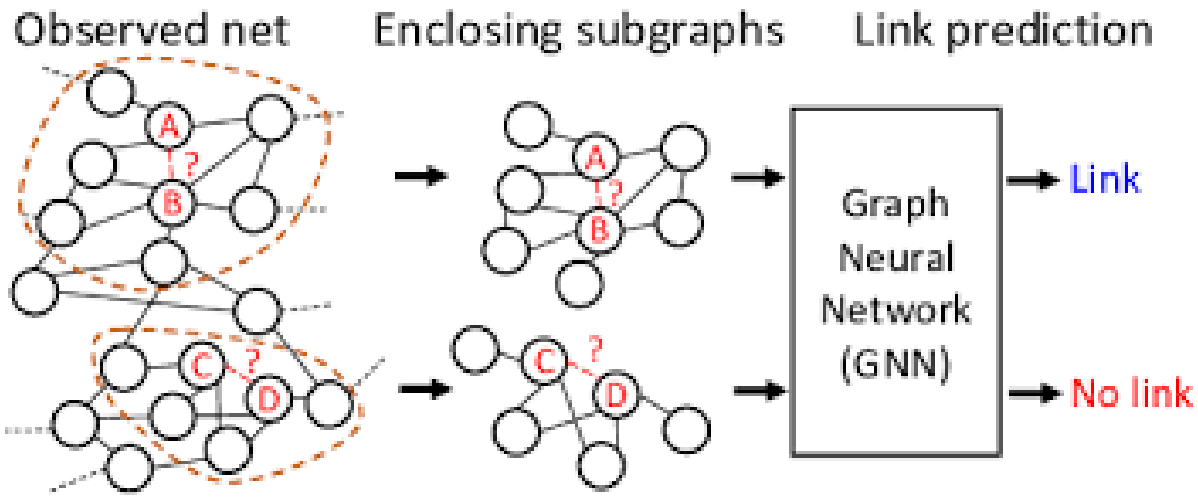
Kinds of Tasks for GNN ?

- **Graph Classification:**
  - The task here is to classify the whole graph into different categories.
  - It’s like image classification, but the target changes into the graph domain.
  - The applications of graph classification are numerous and range from determining whether a protein is an enzyme or not in bioinformatics, to categorizing documents in NLP, or social network analysis.



Kinds of Tasks for GNN ?

- **Link Prediction:**
  - The task here is to understand the relationship between 2 nodes of a graph and then predict whether there's a relation between 2 nodes.
  - It's essential in social networks to infer social interactions or to suggest possible friends to the users.



Thank You