

In this module, I learned about Graph Neural Networks (GNNs). GNNs are a class of deep learning models designed to process and learn from graph-structured data, which has its origins in early work on recursive neural networks and graph embeddings. GNNs have gained significant attention in recent years due to their ability to capture the complex relationships and dependencies among nodes in a graph, making them well-suited for tasks such as node classification, link prediction, and graph classification. Unlike CNNs, which operate on regular grid-like structures such as images, GNNs can handle irregular and non-Euclidean data by leveraging the graph structure and node features to learn meaningful representations. GNNs have found various real-world applications, including social network analysis, recommendation systems, molecular property prediction, and traffic forecasting. However, GNNs also have some limitations, such as the difficulty in handling large-scale graphs, the need for sufficient labeled data for supervised learning tasks, and the potential for oversmoothing, where the learned node representations become indistinguishable after multiple layers of message passing.