Sentiment Analysis of Political Discourse on Platform X using Graph Neural Network (GNN)

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***Abstract*— Social media has become an essential platform for disseminating information in this fast-paced digital era, particularly in political discourse. Sentiment analysis of political discourse is a compelling study area, as it plays a crucial role in influencing policies within a country. Numerous studies have been conducted to examine sentiment across a variety of platforms and different conditions. Graphs machine learning enables the modeling of complex relationships between words and entities, thereby enhancing accuracy in capturing sentiment patterns within text. This research presents a comparison between the Graph Attention Network and the Graph Convolutional Network for sentiment analysis of political discourse on platform X. The results show that GAT performs slightly better across all evaluation criteria, namely, precision, accuracy, recall, and F1-Score, achieving an accuracy of 92.41% using 50 epochs. GCN also presents acceptable and consistent results, with an accuracy of 91.85%, which is comparable to that achieved when using GAT. However, GAT requires a longer training time due to the complexity of computing attention between two nodes. This makes GCN particularly suitable for tasks where faster training speed is prioritized overachieving maximum performance. Applying GNN facilitates sentiment analysis not only from individual texts but also through graph structures that capture communication and influence patterns among users, thereby offering deeper and more accurate insights. This represents one of the significant achievements in uncovering underlying sentiments and gaining a deeper understanding of public perception.**

Keywords*— *social media, platform X, Sentiment Analysis, GNN, graph machine learning