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A New Stochastic Dynamic Graph Embedding Model - DynG2G

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The approaches concerned with learning graph representation have recently captured significant attention since they have a wide range of applications in several ulterior tasks like brain networks, genomic networks, protein-protein interaction, etc. Graph embedding techniques can be effective in converting high-dimensional sparse graphs into low-dimensional, dense, and continuous vector spaces, preserving maximally the graph structure properties. Most of the existing methods for graph embeddings are designed for static graphs. However, in the real world, most of the graphs are dynamic in nature and these existing methods fail to capture the temporal information present in the dynamic graphs. We developed DynG2G - an unsupervised approach that can generate stable node embeddings of dynamic graphs. Instead of representing each node as a point vector in low-dimensional continuous space (a more common approach), we generated the node embeddings in the form of a Gaussian distribution that enabled us to capture the uncertainty associated with the embeddings. Besides, our method is also capable of handling the addition of new nodes and removal of the older ones with time. We have evaluated our model on the link prediction task and compared the results with the current state-of-the-art models.