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MATH 179
Midterm Project Proposal

Midterm Project Proposal: Analyzing LiveJournal Social Networks with a Graph Attention Network

In the last several years, graph neural networks (GNNs) have made significant progress in classifying and analyzing trends in graphical data. Much of this progress can be attributed to the introduction of unique kinds of GNNs, most notably graph convolution networks (GCNs), which leverage the same principles that convolution neural networks (CNNs) use: evaluating individual nodes with respect to their nearest neighbors. Recently, graph attention networks (GATs) have shown promising results on Open Graph Benchmark leaderboards relative to GCNs. In contrast to GCNs, GATs disproportionately weigh the impact of nearest neighbors on individual nodes depending on their relative importance. These features make GATs valuable algorithms for analyzing complex graph networks. Through this project, I intend to adopt the model described by Veličović et. al. in *Graph Neural Networks* on the LiveJournal social network database in the Stanford Large Network Dataset Collection, to identify common features of internet communities and their members. To determine the efficacy of the model, I will test it against the Cora, Citeseer and Pubmed citation network datasets used in *Graph Neural Networks*, before applying it to the LiveJournal database.

References:

Veličković, Petar, et al. “Graph Attention Networks.” [1710.10903v3] Graph Attention Networks, 4 Feb. 2018, export.arxiv.org/abs/1710.10903v3.