**Attention-Based Graph Neural Networks for Image Matching**

This paper provides an exhaustive overview of attention-based GNNs that focus towards learning efficient representations within lower-dimensional spaces while maintaining the topological structure of a graph. Bringing in attention mechanisms that have proven successful in NLP and computer vision, GNNs have been enriched toward selectively focusing on the most discriminative features that filter noise.

Cite: Sun, Chengcheng, Chenhao Li, Xiang Lin, Tianji Zheng, Fanrong Meng, Xiaobin Rui, and Zhixiao Wang. "Attention-based graph neural networks: a survey." *Artificial Intelligence Review* 56, no. Suppl 2 (2023): 2263-2310.

**Graph Clustering with Graph Neural Networks**

Deep Modularity Network: "Graph Clustering with Graph Neural Networks" by Anton Tsitsulin et al. discusses current limitations of pooling in GNNs in graph clustering tasks. The authors propose a novel unsupervised pooling scheme based on modularity, dubbed Deep Modularity Network (DMoN). They show how DMoN significantly outperforms previous approaches, such as when achieving >40% improved clustering quality on real-world data. The authors perform large-scale experiments in both graph and attribute clustering tasks and concluded that DMoN outperforms other methods on most tasks, proving it to be an effective solution for robust unsupervised graph clustering.

Cite: Tsitsulin, Anton, John Palowitch, Bryan Perozzi, and Emmanuel Müller. "Graph clustering with graph neural networks." *Journal of Machine Learning Research* 24, no. 127 (2023): 1-21.

**Constellation Detection using Image Processing and Template Matching**

The paper attempts to formulate an unsupervised mechanism of tracking the satellite constellations through template matching and generation. First, we detect RSOs in optical images using a single RSO template and then form a constellation template preserving the locations of all detected RSOs. We keep updating this template as it continuously changes owing to varying configurations of the satellites and compare the further frames using normalized cross-correlation. The method includes cross-frame RSO association and orbit determination using Gooding's method followed by Unscented Kalman Filter for accurate orbit estimation. The algorithm effectiveness is demonstrated through imagery taken with a ground-based telescope.

Cit: Ahmadi, Negar. "Modulation recognition based on Constellation shape using TTSAS algorithm and template matching." *Journal of Pattern Recognition Research* 1 (2011): 43-55.