Paper 2 [Oct 22 2022]

**What was the paper doing?**

The aim of this paper was to utilise graph neural networks to filter and propagate information for computer vision related tasks.

**What new thing did I learn from the paper?**

I learnt about a Guided map/adaptive kernel, which was basically just a dynamic graph provided to the Graph Neural Network which can help alter the computer vision operation applied upon the graph. By providing a graph of a certain type the operation would lead to a filtering, while another would lead to a diffusion of features.

**Was there anything they could improve on?**

This paper provided a great depth of explanation upon the basic mathematical principles behind the application of Graph Neural Networks within computer vision tasks. However, they had provided little to no information on how they coded the model. They just provided the structure of the 3 QIA-GNN Layers (The graph neural network model they developed for computer vision tasks), but no information on their loss function, hyper parameters, training and testing data etc.

**What applications are there for this paper that I can think of?**

The biggest application I can think of in this paper is the ability to power modern camera applications. The ability of this model to perform a high variant of computer vision operations with slight alterations to its guided map architecture makes me think it would be more computationally efficient to run this in the background of camera applications for quick picture modifications.

**Does this paper share ideas/similarities to other concepts/papers I have considered before?**

The key idea this paper shares is the similarity of QIA-GNN to a conventional CNN, they are similar in goal and effect. However, the implementation between the two varies, as they are operated over the image differently. CNN uses a constant kernel architecture, whilst the QIA-GNN uses a guided map architecture to convolve features.

[Below are my personal notations whilst reading the paper, and contains more information that I could not provide whilst answering my preset questions I have given myself]

[NeurIPS-2019-adaptive-gnn-for-image-analysis-and-editing-Paper.pdf](https://drive.google.com/file/d/1EZh2Hk9bDGvh1mVWM21lk40B9rZkyI2V/view?usp=share_link)