"LAPGAN for Facial Image Sharing" Competitive Analysis

1 Introduction

A Laplacian Generative Adversarial Network (LAPGAN) is a kind of adversarial network that performs image upscaling iteratively. That is, the input to the network will be given as a small image, perhaps 28 by 28 pixels, that will be processed by the first node (adversarial network). The output of the first node will be fed into the next network node. This process continues until the image is of the desired dimensions and quality.

2 Competitors

There are other methods that preceded this technique, the most prominent of which was the Deep Convolutional Generative Adversarial Network. This network was able to create novel images, but the output of the network was not of a very high quality. Similar architectures, such as the Variational Autoencoder (VAE), have been used in the domains of noise cancellation and filtering; however, VAEs perform poorly on image data compared to Generative Adversarial Networks.

3 Dimensions for Comparison

Listed below are some of the ways that the LAPGAN will be compared.

1. Output quality. How good the quality of the ouput images are.
2. Training time. Is the network quick to train.
3. Model size. Is the model small enough to fit on a mobile application.
4. Speed. Does the model process images quickly
5. Compression ratio. Can the model downsample an image a lot and still recover a good output.

	dimension 1	dimension2	dimension 3	dimension 4	dimension 5
VAE		✓	✓	✓	
DCGAN	–	✓	✓	✓	
LAPGAN	✓		✓		✓

4 Summary

In order to be competitive, any new implementation of the LAPGAN should employ most or all of the elements that past variations or architectures provided in addition to some new element. Taking this into account the implementation of the architecture will strive to be be faster, and the training time will be limited to a single day of training to reach an optimum loss.