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Review Article

Fake Image Generator

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A B S T R A C T

Generative Adversarial Network which is popularly known as GANs is a deep learning, unsupervised machine learning technique which is proposed in year 2014. The main blocks of this architecture are; Generator: This block tries to generates the images which are very similar to that of original dataset by taking noise as input. It tries to learn the join probability of the input data (X) and output data(Y); P(X|Y). Discriminator: This block tries to accept two inputs, one from main dataset and other from images generated from Generator, bifurcates them as Real or Fake. To make this Generative and Adversarial process simple, both these blocks are made from Deep Neural Network based architecture which can be trained through forward and backward propagation techniques. From the time GANs were introduced, there has been tremendous advancement in the GANs. There are GAN architecture which are specifically made for some tasks. We heard the news on Artistic Style Transfer and face-swapping applications (aka deepfakes), Natural Voice Generation (Google Duplex), Music Synthesis, smart reply, smart compose, etc. The technology behind these kinds of AI is called a GAN, or "Generative Adversarial Network". A GAN takes a different approach to learning than other types of neural networks. GANs algorithmic architectures that use two neural networks called a Generator and a Discriminator, which "compete" against one another to create the desired result. The Generator's job is to create realistic-looking fake images, while the Discriminator's job is to distinguish between real images and fake images. If both are functioning at high levels, the result is images that are seemingly identical real-life photos. Generative Adversarial Networks have had a huge success since they were introduced in 2014 by Ian J. Goodfellow and co-authors in the article Generative Adversarial Nets.

Keywords: Natural Voice Generation (Google Duplex), Music Synthesis, Smart Reply, Smart Compose

Introduction

A GAN takes a different approach to learning than other types of neural networks. GANs algorithmic architectures that use two neural networks called a Generator and a Discriminator, which "compete" against one another to create the desired result. The Generator's job is to create realistic-looking fake images, while the Discriminator's job is to distinguish between real images and fake images. If both are functioning at high levels, the result is images that are seemingly identical real-life photos. Generative Adversarial Networks have had a huge success since they were introduced in 2014 by Ian J. Goodfellow and co-authors in the article Generative Adversarial Nets. To

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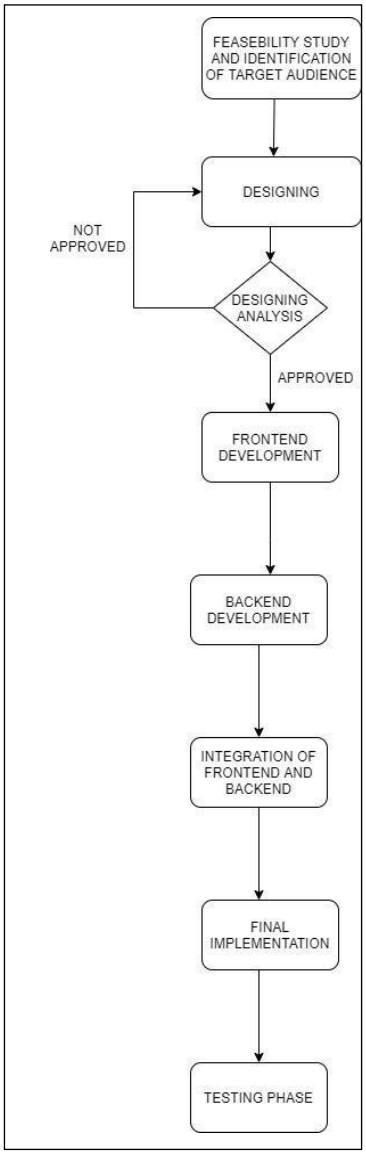

Figure 1. Refer to the following diagram to understand the planning of this project

Objective

The objective of fake image generation is to help people with thousands of images which can be further used for training model or this can be used in image editing, morphing.

Related Work

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Nvidia Style GAN ADA

Training generative adversarial networks (GAN) using too little data typically leads to discriminator overfitting, causing training to diverge. We propose an adaptive discriminator augmentation mechanism that significantly stabilizes training in limited data regimes. The approach does not require changes to loss functions or network architectures, is applicable both when training from scratch and when fine-tuning an existing GAN on another dataset. We demonstrate, on several datasets, that good results are now possible using only a few thousand training images, often matching StyleGAN2 results with an order of magnitude fewer images. We expect this to open up new application domains for GANs. We also find that the widely used CIFAR-10 is, in fact, a limited data benchmark, improve the record FID from 5.59 to 2.42.

Feasibility Study

Every application has its own merits and demerits. The project will fulfil most of the necessities. More needs and enhancements will simply be done since the code is especially structured or standard in nature. I can add new features with the existing features for further development.

Here I have mentioned the feasibility of our project in 5 distributed areas:

Technical Feasibility: For our project I have ensured the presence of all the technical resources to successfully execute this project. I have evaluated all the hardware, software, other technical assets and they meet the requirements of our project.

Legal Feasibility: Every stage of this project has met all the laws and regulations listed for the development of the project until now. For further I'll will ensure that the project meets all the regulations and that everything is made according to the format provided.

Operational Feasibility: I aim to develop this project by following proper steps and after all the operational research. I think that the output will be in accordance with

the expectations. The process is reliable and moreover maintainable because everything would be done on our own.

Feasibility within a Reasonable Period of Time: The time given to us for the completion of the project is reasonable for our project. I have step wise scheduled the work for the completion of the project in a given time frame. Moreover, quality of work is maintained throughout the process.

Economical Feasibility: This is an important aspect to be considered while developing a project, the technology I decided to work on is based on the minimum possible cost factor. All hardware and software courses are provided by the organization. Overall, I have estimated that the benefit the organization is going to receive from the proposed system will ensure to overcome the invested cost.

Future Work

To overcome the above-mentioned problem, Gan comes to our rescue. In this computer vision project that is Fake Image Generation, we can randomly generate face of any one. By simply giving random noise to our trained model we can generate thousands of fake images. I've also included one application of GAN that is Morphing.

Fake image Generator doesn't use any pretrained model for image generation and without any image pre-processing we're able to produce a good-looking face. We made 96*96px images as higher computational power.

We trained our model for around 50 epochs and with batch size 32 in which we got gan loss of around 0.878 and discriminator los was around 1.34, which is near to the ideal condition of GAN.

Generates image just by giving some random noise using a DCGAN Generator.

Conclusion

Fake image Generator doesn't use any pretrained model for image generation and without any image pre- processing we're able to produce a good-looking face. We made 96*96px images as higher computational power.

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