**Art Creation using AI**

# Introduction

## Overview

Art Cration using an A.I. is an art generator project that can generate art using Artificial Intelligence(A.I. or AI). It will generate art between human faces and other scenarios. The arts that has been generated can be either common or unique which depends on how well the A.I. is trained to generate them.

A painting of a person

Description automatically generated with medium confidence

Figure 1 Portrait of Mona Lisa by Leonardo da Vinci

## Aims

The aim of this project is to develop an art generator with the addition of Neural Networks(NN) that will generate an art of a scenario or human structure or etc. To train an NN model for generating different artworks would require dataset of different arts that has been drawn by different famous artists to show the model the different portraits of different art styles. With this type of training the model will be able to generate an art and with the training improved not only would the project generate a common art but also a completely new and unique one. This project would one of a better and yet most useful tools to draw an art using computers besides papers and pencils thus aiding other people and artists in expanding their creativity especially.

## Objectives

The main objective is using Generative Adversarial Networks which are a recent advancement in AI that are used to generate data (GANs). Real-world data synthesis is GANs' primary function. After training, the GAN model, for instance, may produce brand-new face images of wholly fictitious individuals given a collection of face photographs. Deep fake is only one of the numerous computer vision applications that have made use of it.

A generator and a discriminator are two deep learning models that make up the Generative Adversarial Network model itself. The discriminator's job is to determine if an image is authentic or fraudulent. On the other hand, the generator will make false images and watch the discriminator's classification process in an effort to deceive it.

From a different angle, even for us as humans, creating art is a really difficult undertaking. Consequently, it would be incredibly expensive to buy a work of art. A very practical and affordable solution for producing excellent artwork would be to use GANs. This project aims to train a GAN model to produce images of high-quality artwork. There are several publicly accessible datasets that might be used to train the GAN model. TensorFlow or Pytorch are two examples of deep learning frameworks that will be used to create the GAN model. This technique can be applied in a wider range of situations, such as developing a website where users can explore and purchase AI-generated artwork. Several research questions involved in this project is Where to start when developing a an art generator with a GAN model and how can it be implemented? Which framework is best suited for training Neural Network? Where and when to start implementing the discriminator and generator for the GAN model?

## Background

Since the earliest cave paintings, art has always played a significant role in human society. It allows us to communicate our ideas and tell stories. Artificial intelligence (AI) has advanced recently, and people are investigating how it might be used in a variety of fields, including the arts. The ability to understand and appreciate art, however, is typically thought to be unique to humans (Kundu, 25 October).

The phrase "artificial intelligence" has been influenced by decades of science fiction, which has envisaged computers capable of free thought, autonomous learning, and possibly even emotions in a variety of ways, whether they were as good as WALL-E or as evil as HAL-9000. Therefore, it may not be our fault if we imagine something entirely different from what artificial intelligence (A.I.) is capable of when we hear the term "art". Although technologists are actively working toward it, the oracular being we picture as the maestro behind such artworks is not yet a reality. It is what researchers today would refer to as a "artificial general intelligence." According to A.I. artist and researcher Amelia Winger-Bearskin, "I think a lot of people prefer to assign almost mystical characteristics to A.I. as it is something beyond human ken, something that is more pure in that regard." It's just a bunch of nerds coders and artists doing stuff, so it's actually rather untidy. Even while the concept of artificial intelligence (AI) art is very cool, the messy reality is that artists who engage with computer systems have considerably more control over the results than the phrase might imply: they provide the inputs, direct the process, and filter the outputs. For a variety of reasons, artists have been drawn to using artificial intelligence in their work. Some are interested in working with the most cutting-edge technologies, others use it as a way to incorporate chance into their work, and still others see potential for it to expand certain aspects of their current practices (Rea, 2021 Dec).

The earliest days of computer graphics and the creation of the computer are where the history of AI-generated art may be found. Simple patterns and forms were produced using computer graphics in the 1950s and 1960s. These early examples of artificial intelligence (AI)-generated art) were produced by generating patterns on a computer screen using simple algorithms. In Generative Adversarial Networks (GANs), which were first introduced in 2014, two neural networks are often pitted against one another to improve both of them as learners. Imagine that we need to add fresh images to a dataset in order to improve image classification. The deep network that produces new images is one of the two networks and is referred to as a generator. The other network, referred as a discriminator, is tasked with determining if the image provided as input is genuine or a fake produced by the generator. The generator gets better at imitating the original photos in later rounds in an effort to trick the discriminator, while the discriminator gets better at identifying the real images from the fake. The minimax problem, an antagonistic game, trains both networks. After the training loop is over, the discriminator has improved to the point where it can produce realistic images that are nearly identical to the original. GANs are frequently used to create fonts, drawings, human faces, and animated characters(Kundu, 25 October).

## Research Approach

The greatest method for research would be to revise through various kinds of neural networks. This is due to the fact that, as was previously discussed, any AI models would eventually need to be trained using neural networks that could be integrated into a program with the AI. The deep learning and GAN model would be an ideal models to study further as well implementing in this project. It is crucial to think about the frameworks needed to create a NN model, and one of those frameworks is TensorFlow. Additionally, it would be good to conduct study on any files or arrays that could be required to be incorporated into an AI model in order for it to interpret the data and behave as predicted when given relevant data. Studying the discriminator and generator is highly considered since they are partly GANs. Also studying and organizing arrays and datasets of different artworks is highly considered in terms of help training GANs(with discriminator and generator) to generate art.

## Potential Outcomes

The project would be able to generate different types of art whether it was new or the most common image. This is due to training the GANs model using a dataset of different artworks and since it is a GANs model the discriminator and generator are highly involved with the potential outputs. As stated before, The discriminator's job is to determine if an image is authentic or fraudulent. On the other hand, the generator will make false images and watch the discriminator's classification process in an effort to deceive it.

## References

Kundu, Rohit. “AI-Generated Art: From Text to Images & beyond [Examples].” Www.v7labs.com, 25 Oct. 2022, www.v7labs.com/blog/ai-generated-art.

Rea, Naomi. “How Did A.I. Art Evolve? Here’s a 5,000-Year Timeline of Artists Employing Artificial Intelligence, from the Ancient Inca to Modern-Day GANs.” Artnet News, 16 Dec. 2021, news.artnet.com/art-world/artificial-intelligence-art-history-2045520.