

# **PHOTOREALISTIC IMAGE SYNTHESIS FROM TEXT DESCRIPTION USING MACHINE LEARNING**

Photorealistic image synthesis has been difficult till date with the existing technologies however Artificial Intelligence makes this possible, we can benefit a lot from the wide application of this emerging technology. It can be employed to replace human labors in completing many tedious tasks. The objective of this project is to generate photorealistic images from a text description given by a user of a specific thing, object or being using machine learning. This project can be used by designers, engineers to generate designs based on concepts that they've thought.

We propose a system using a Generative Adversarial Network (GAN) which is a machine learning model which consists of a Generator and a Discriminator both of which are trained with the same dataset, the Generator is used to generate fake images based of the real images from the dataset that's used to train it. The Discriminator classifies the generated image as fake or real, when the Generator generates an image so compelling and realistic the Discriminator classifies it as real. This project is built using a stack GAN which consists of two GANs, the first GAN is called a stage 1 GAN which takes the sentences which are represented as word vectors and generates an image with primitive shapes and basic colors, it is a low resolution image, the second GAN is a stage 2 GAN which takes the image generated by the stage 1 GAN and the original text description as the input and generates a much higher resolution version of the image by completing the details.

This project will be developed in Python and Tensorflow, an open source machine learning library. The project will be supported on all platforms that support Python and the required dependencies. This project requires a system with a powerful 64 bit multicore processor.

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