Restoration of images

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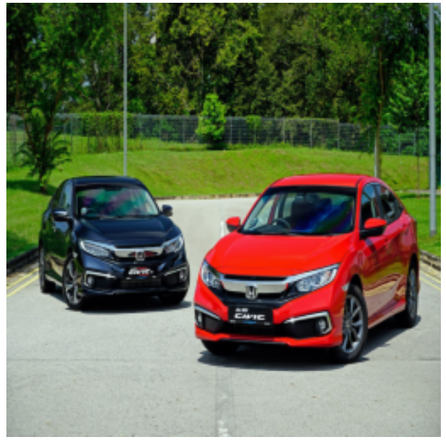
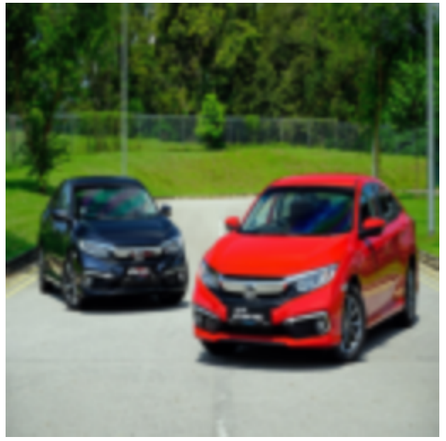
The goal of the project

The goal of the image restoration project is to enhance the quality of low-resolution images. This process can be highly beneficial in fields such as forensics, art, medical diagnostics, and many others where improving image quality is necessary for better analysis and interpretation.

High resolution image



Low resolution image



Generated image

Datasets

The dataset used in this project was obtained from the website Kaggle and consists of a collection of images with both high and low resolution. The dataset comprises a diverse range of images from various sources and covers different subjects and scenarios.

Algorithm

For image restoration, a Generative Adversarial Network (GAN) was used in this project. GAN consists of a generator, which generates high-resolution images based on low-resolution input images, and a discriminator, which distinguishes between real and generated images. These components are trained together to achieve image restoration, with the generator learning to generate realistic high-resolution images and the discriminator learning to differentiate them. This process enables the restoration of details and improves the quality of images during the restoration process.

Results

Shorter training with fewer epochs generally leads to poorer image restoration results, with less detail and less sharpness. On the other hand, longer training with more epochs can improve the quality of restored images, providing greater sharpness, fidelity to the original, and better detail reproduction. It is also very important to find a balance between the speed with which the discriminator is trained and the speed with which the generator is trained, in order to obtain the desired results.