NANYANG TECHNOLOGICAL UNIVERSITY SINGAPORE

School of Computer Science and Engineering
College of Engineering

Be a Cartoonist

Editing Anime Images using Generative Adversarial Network

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Project Objectives

The aim of the project is to:

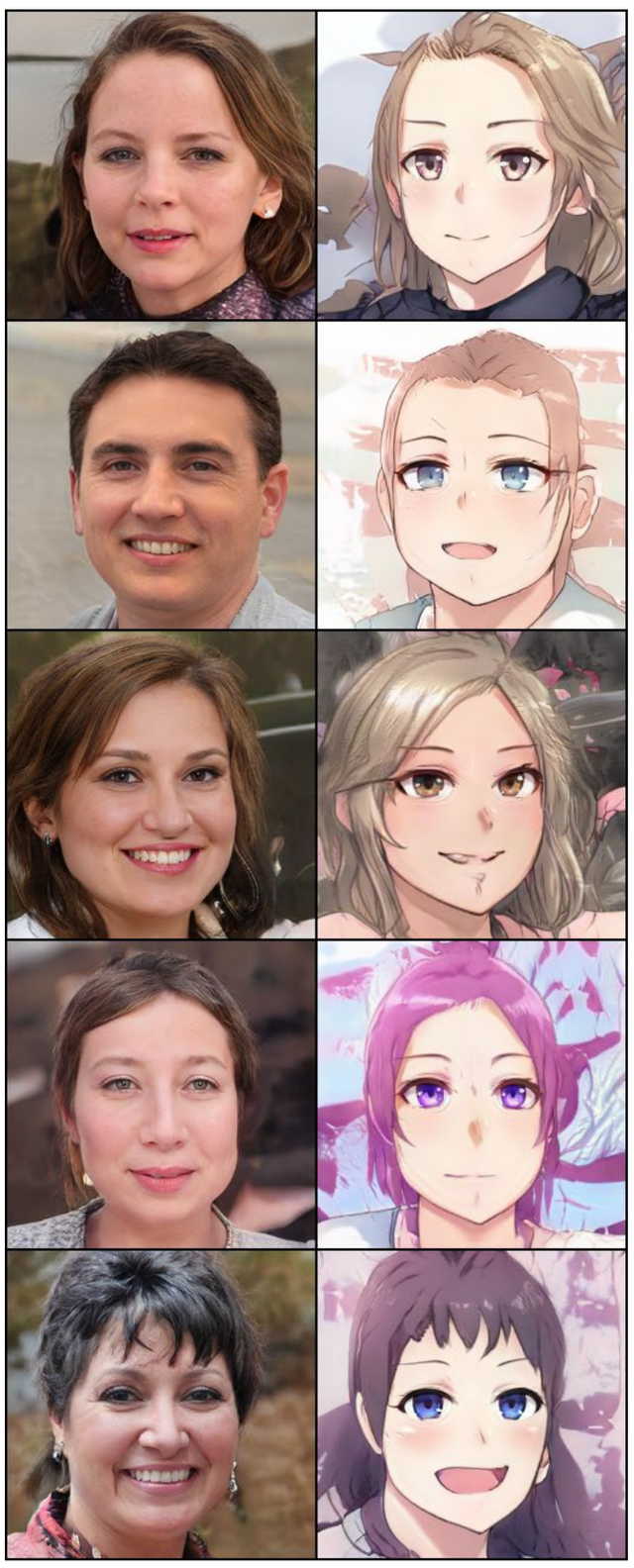
- Translate a real human face into an anime face
- Perform Image editing
- Perform model compression to reduce the size of the trained model

Proposed Solution

To perform the image-to-image translation, we proposed the use of a facial feature-based multi-discriminator framework built on top of the StyleGAN2 architecture to perform image-to-image translation. Using closed-form factorisation, we perform image editing by modifying the latent directions of the latent vectors which will result in changes to image's facial features. Lastly, model compression is performed through knowledge distillation to train a smaller model which is computationally less intensive to run while retaining high quality image generation.

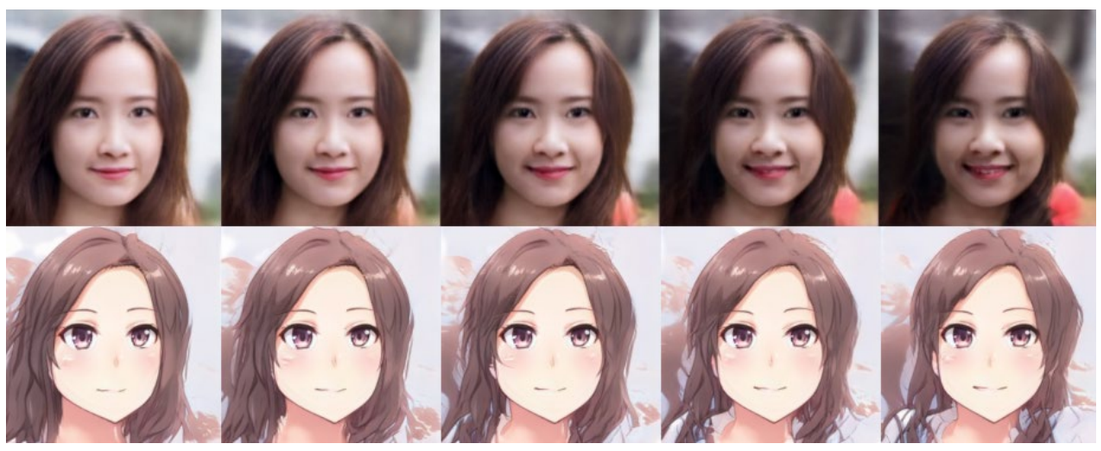
Translation

Real → Anime



Real → Anime

Editing



We can alter the face pose and expression of the real life faces as well as the translated Anime face without using image editing software.

Compression

Network	FID Score	MAC
StyleGAN2 Model	4	14 Billion
StyleGAN2 (Reduced Channels)	5.3	1.8 Billion
Our Compressed Model	4.3	1.8 Billion

Our model, trained through knowledge distillation, generates better image with a lower FID score than simply training a model with reduced channel. It also has significantly lower MAC operations than original StyleGAN2 model.