Deep Image Enhancement

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Project Objectives

This project is separated into two parts. In the first part, the task of image denoising is taken out, whose focus is to reduce the unpleasant noise in the input image, and produce a visually clean image. In the second half of this project, the focus is shifted to blind face image restoration due to the finding where even a subtle change in the input could lead to substantial changes in the output.

Model Architecture

Generative Latent Bank
- Short for GLEAN is used in the 1st part
- E_i, S_i and D_i denote the encoder blocks, latent blocks and decoder blocks respectively.
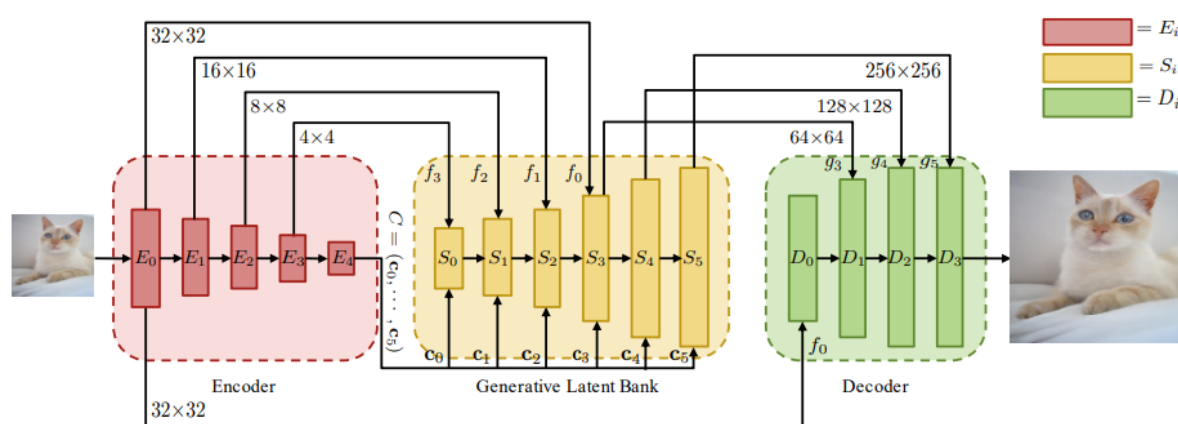
GAN Prior Embedded Network
- Short for GPEN used in the 2nd part
- (a) represents the GAN prior network, (b) represents detailed structures of a GAN block, (c) represents the full network architecture of GPEN.
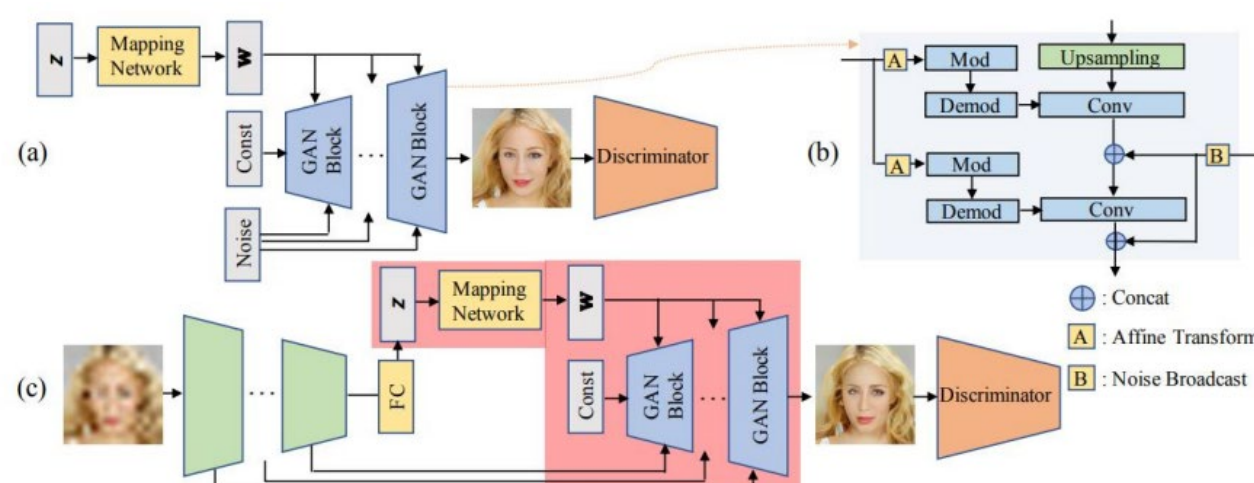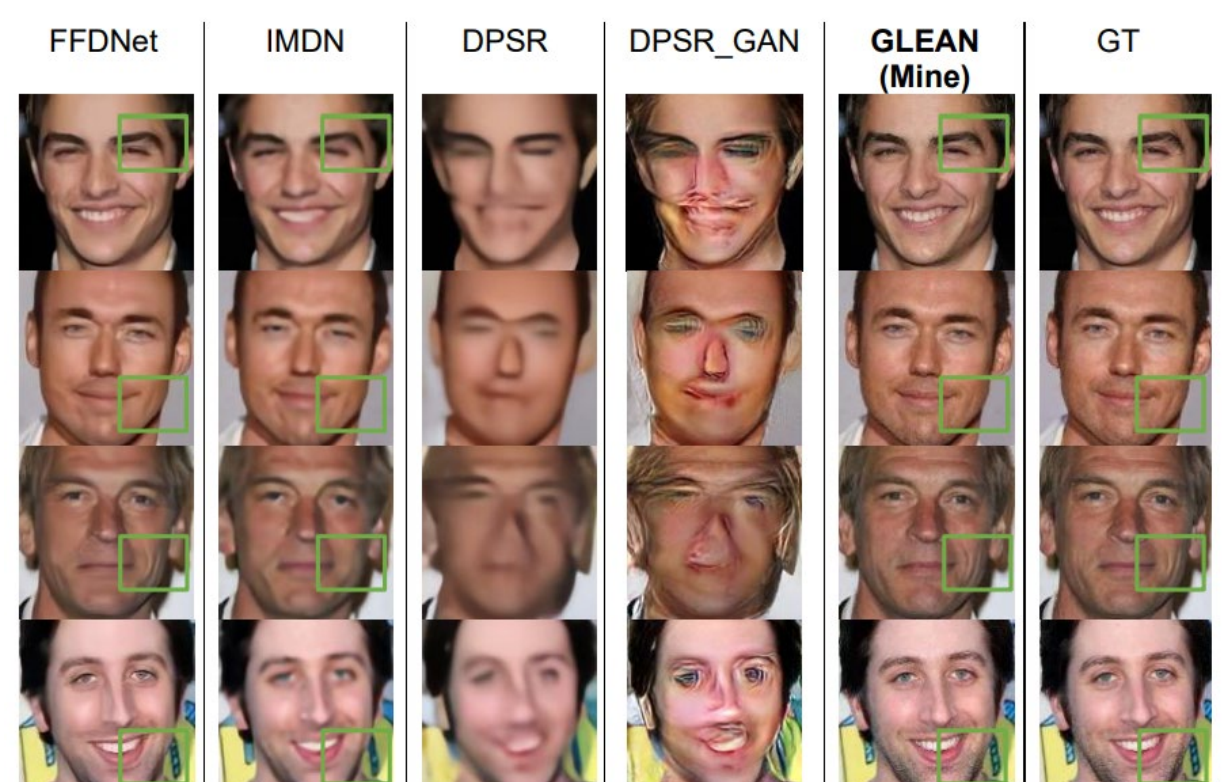

Dataset
- **CelebFaces Attribute Dataset (CelebA)**
  - More than 200K celebrity images
  - Each with 40 attribute annotations

- **WIDER FACE Dataset**
  - Organized based on 61 event classes

Experiment Results

Result for 1st part:
- The purpose of this part is to denoise the input noisy images and compare the outputs of my model with other models.

Result for 2nd part:
- The purpose of this part is to restore real-world low-resolution face images to high resolution photo-like images. The results are achieved by another method of image pre-processing.