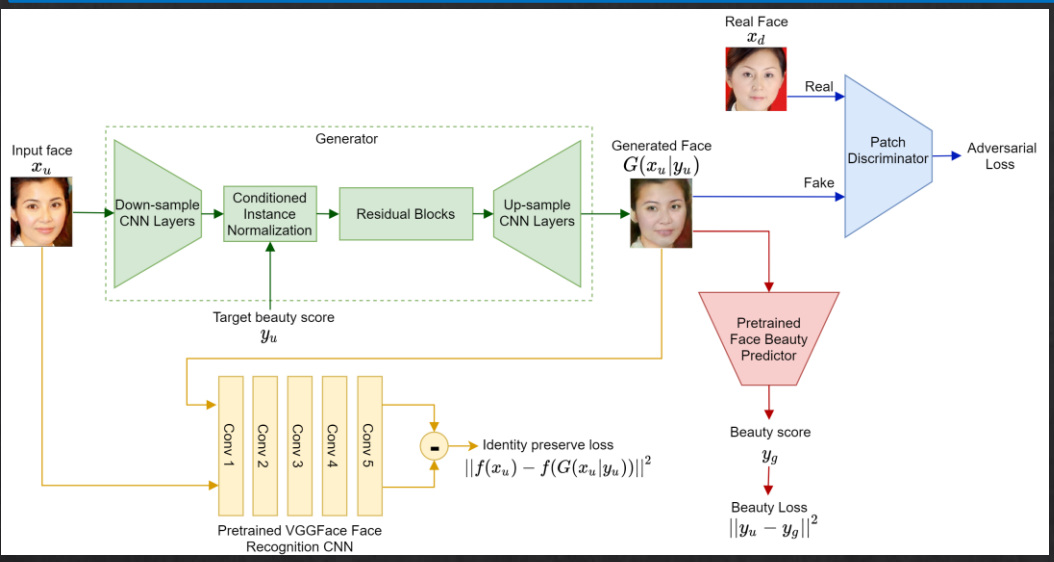
Identity-Preserved Beauty Transformation with Conditional Generative Adversarial Networks

Zhitong Huang, Ching Yee Suen CENPARMI, Concordia University

What is Identity-Preserved Beauty Transformation?

Identity-Preserved Beauty Transformation aims to change the beauty scale of a face image to target beauty scale indicated by a real-numbered beauty score in the range 1.0 to 5.0, while the original identity of the face image is preserved.

Overall Structure



The framework consists of three parts:

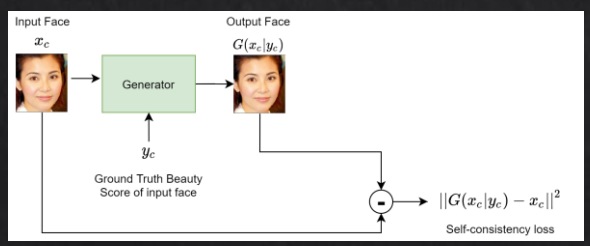
(1) A cGANs module which helps the generator to produce realistic face images;

(2) A face beauty predictor module which ensures the beauty scale of the generated face equals the target beauty score;

(3) An identity-preserve module which guarantees the generated face has the same identity as the input face.

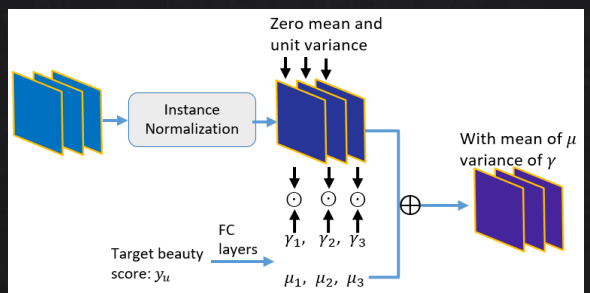
Self-Consistency Loss

The generated face is required to be exactly the same as the input face, when the ground-truth beauty score of the input face is fed as the target beauty score.

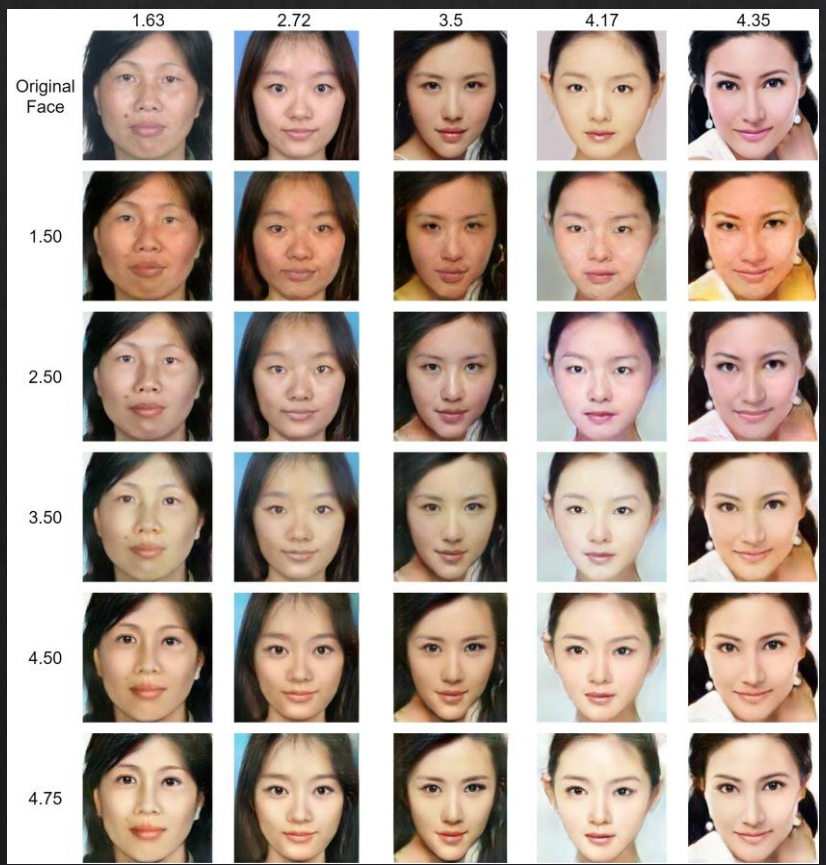


Conditioned Instance Normalization

The intermediate feature of the input face is combined with the target beauty score through conditioned instance normalization, where the channel-wise mean and variance of the feature are swapped to the new mean and variance mapped from the target beauty score.



Result: Generated Faces



The scores on the first row indicate the original beauty scores of the input faces. The scores on the left column show the target beauty score of the generated faces.