



# Your Favorite Face

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## Motivation

- There is no tool to create a personalized face that reflects the preferences of a specific user.
- A fake-celebrity face generator exists but it does not reflect user-specific preferences.
- A tool that learns user's preferences through ranking of images and merges learned features to construct a new, personalized optimal face.

## Challenges

- Devising well-performing encoder for creating embedding vectors of images and a decoder to re-generate images.
- Choosing the optimal noise generated from the extracted feature vector as an input to the generator.
- Complexity in hyperparameter tuning as multiple networks are involved.
- Measuring qualitative attraction to the face.

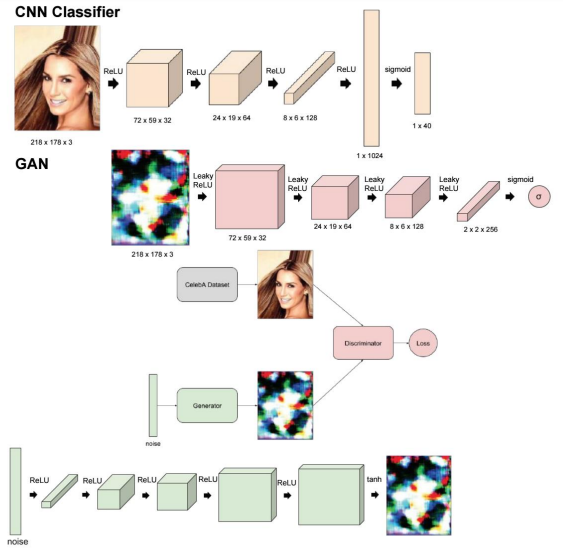
## Dataset

- We have used Large-scale CelebFaces Attributes (CelebA) dataset, which provided 202,599 images of celebrities with 40 attributes defined.
- The raw data was in shape of 218 x 178 x 3, which we flattened into column vectors of dimension 116,412

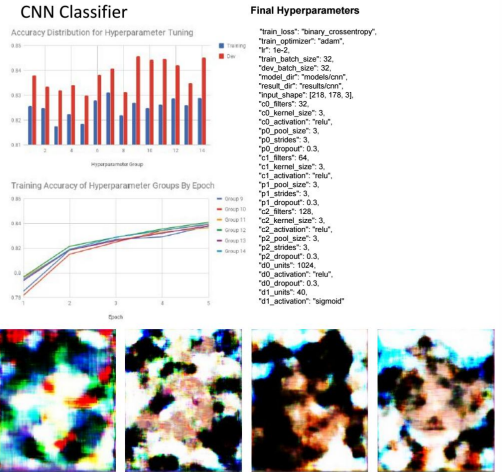
## Approaches

- User ranks different facial features.
- CNN classifier extracts 40 different facial features from the image.
- Train the GAN generator and discriminator with fake images and real images.
- Trained GAN model generates a new face based on the feature vector extracted from the CNN classifier.
- User rates the attractiveness of the face

## Model



## Results



## Analysis

- Without performing batch normalization on data, we found that generator easily converges to what seems to be a local maxima and always outputs the same image
- One solution to this is to create label normalization, which is to occasionally feed false information to discriminator to make the task more challenging.
- For generating noise for input of GAN, given a picture we overlapped its predicted labels on the normal distribution of noise

## Contact

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## Reference

Tero Karras, Aila, Timo, Laine, Samuli, Lehtinen, Jaakko (2017). Progressive Growing of GANs for Improved Quality, Stability, and Variation.