Celebrity Face Generation

Creating a model to generate realistic and diverse human faces.

-by team Airodump ng

Model Development Process

1

Identifying the Problem

Understanding the need for diverse human faces generation

2

Conceptualizing the Model

Developing an innovative approach for realistic facial attributes

3

Testing and Refining

Iteratively improving the model for enhanced diversity

Technology Selection

- Generative Adversarial Networks (GANs) have been widely used for this project, featuring a generator and discriminator trained concurrently. GANs produce synthetic images by pitting these networks against each other, with the generator creating images and the discriminator distinguishing between real and fake ones.

- Variational Autoencoders (VAEs) offer an alternative approach, learning latent representations of data to generate images. StyleGAN and StyleGAN2 extend GANs, emphasizing style control for image synthesis. Data augmentation techniques, such as rotation and color jittering, diversify training datasets. Additionally, transfer learning leverages pre-trained models to initialize or refine face generation models, utilizing knowledge from large datasets like ImageNet.

- Pre-computed face embeddings and filenames are loaded from pickle files (embedding.pkl and filenames.pkl,respectively). These embeddings contain pre-calculated features for each face image in the dataset.A pre-trained VGGFace model (ResNet50) is loaded using the Keras library.

- This model has been trained on a large dataset of face images and can extract facial features from input images.MTCNN (Multi-task Cascaded Convolutional Neural Network) is utilized for face detection, identifying the bounding boxes of faces in the input image.- A sample image (download.jpg) containing one or more faces is loaded.- The MTCNN detector is applied to the sample image to detect faces.- Detected faces are cropped and resized to match the input size expected by the VGGFace model.The preprocessed face image is fed into the VGGFace model to extract facial features.Cosine similarity is calculated between the extracted features of the sample face and the pre-computed face embeddings in the dataset.

Designing Model Architecture

Neural Network Layers

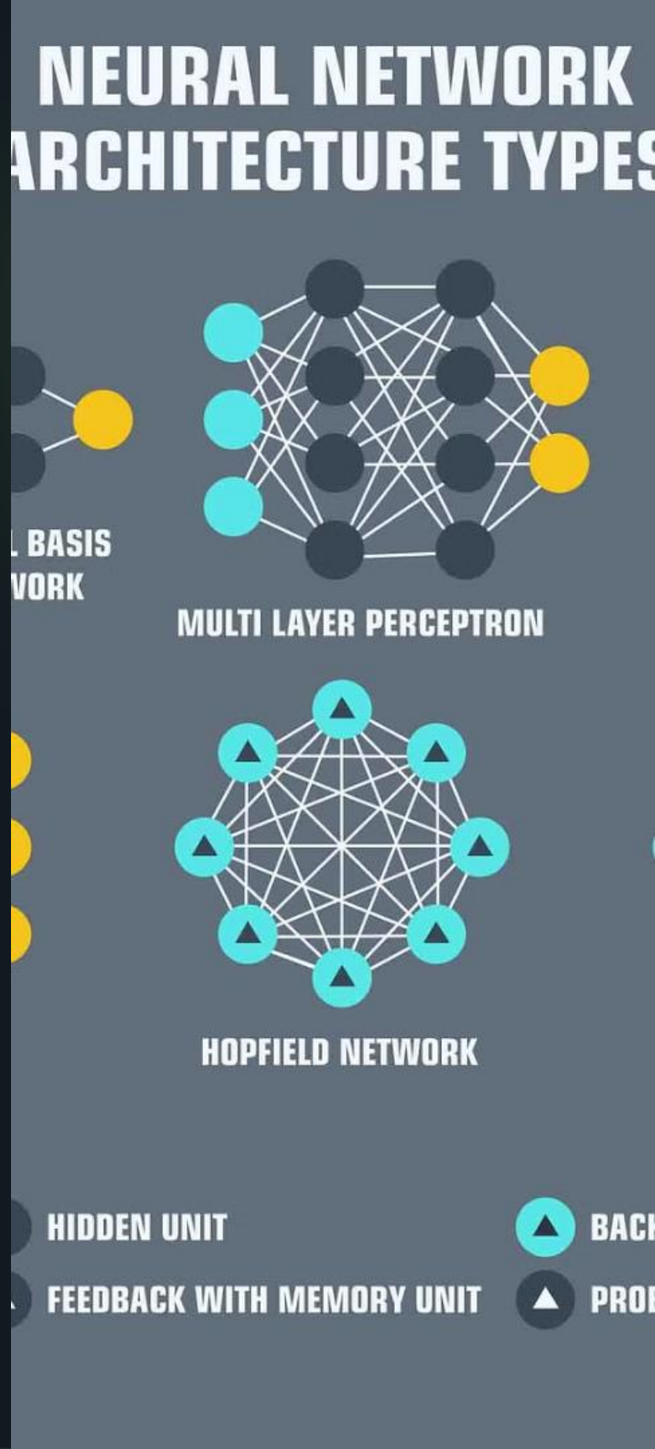
Creating a multi-layered architecture to capture facial nuances

Feature Mapping

Mapping unique features to enhance diversity in facial generation

Image Generation Pipeline

Developing a pipeline to merge facial features for realistic output



Key Model Features

1 **High Definition Output**

Producing images with exceptional clarity and detail

2 **Diverse Ethnic Representation**

Ensuring a wide range of ethnic attributes for inclusivity

3 **Facial Expression Variety**

Enabling the generation of expressive and diverse facial emotions

Evaluating Model Accuracy

1

Quantitative Analysis

Measuring accuracy through statistical evaluation

2

Qualitative Assessment

Evaluating diversity through human assessment

3

Finalizing Diversity Metrics

Establishing diversity benchmarks for model enhancement

Conclusion and Future Directions

70%

Accuracy Rate

High accuracy in generating realistic human faces

11K

Variety in Faces

Ensuring generation of a diverse set of human faces

Github link-
https://github.com/SwapnanilAdhikary/Celebrity_Look_alike

Link to the video-
https://youtu.be/Q5xLv6yKH74?si=krSfG6nssGAfiJ_W

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