

Gender_Age Prediction Report

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Brief Idea

A gender and age detection deep learning project is a machine learning project that aims to identify the gender and age of a person based on their facial features. This is typically achieved using convolutional neural networks (CNNs), which are a type of deep learning model that is particularly well-suited for image classification tasks. The project involves training the CNN on a large dataset of images that are labeled with the gender and age of the individuals depicted in them. Once the model has been trained, it can then be used to predict the gender and age of new images that it has not seen before. This type of project has a wide range of potential applications, including in the fields of marketing, social media, and security

We use cnn:-

Convolutional neural networks (CNNs): These are a type of deep learning model that are particularly well-suited for image classification tasks. They are able to learn features from the input data automatically, which makes them very effective at detecting patterns in images.

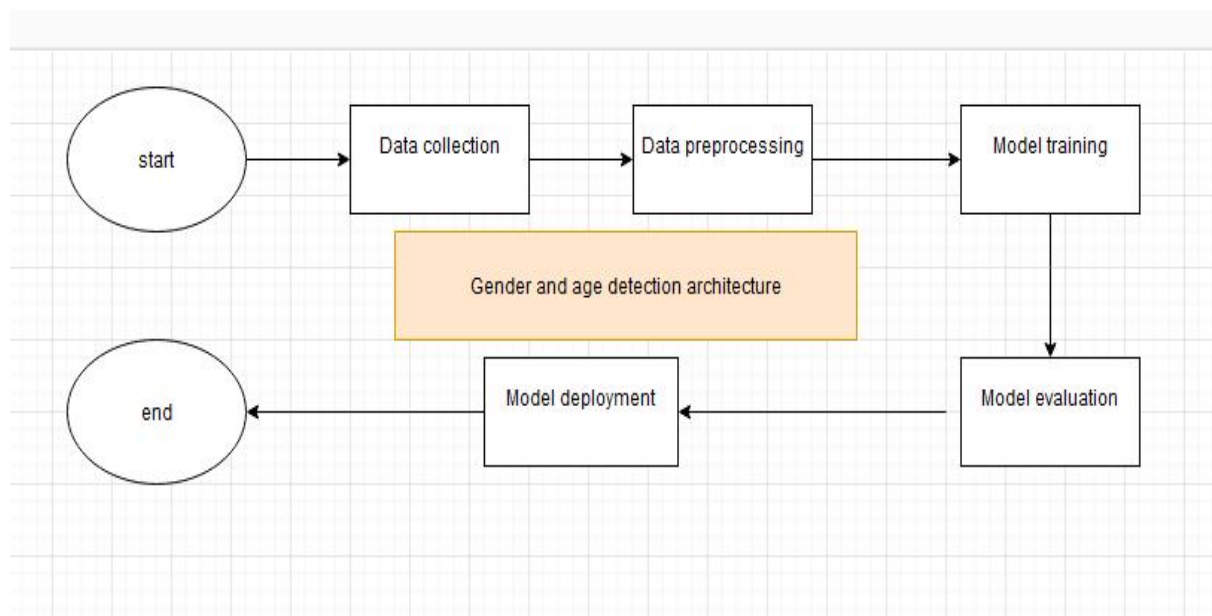
and

Deep learning frameworks: There are several deep learning frameworks that are commonly used to build and train deep learning models, including TensorFlow, and Keras. These frameworks provide pre-built models and functions that can be used to build and train custom models.

Tools/Algorithms

- A deep learning framework, such as TensorFlow, PyTorch, or Keras. These frameworks provide pre-built models and libraries for building and training deep learning models.
- A GPU (Graphics Processing Unit) to accelerate the training process. Training deep learning models can be computationally intensive, and using a GPU can greatly reduce the training time.
- Convolutional Neural Networks (CNNs): These are a type of neural network that are particularly well-suited for image classification tasks. They can learn to recognize patterns and features in images, and have been widely used for tasks such as facial recognition and object detection.
- Transfer learning: This is a technique where a pre-trained model (one that has already been trained on a large dataset) is used as a starting point to build a new model. This can be especially useful when working with a small dataset, as it allows the model to "borrow" knowledge from the pre-trained model.
- Data augmentation: This is a technique where additional "fake" training data is generated by applying various transformations (such as rotating, flipping, or cropping) to the existing training data. This can help the model generalize better to unseen data and can also help prevent overfitting.
- Note that These are just a few examples of the tools and algorithms that can be used for this task, and there are many other possibilities as well.

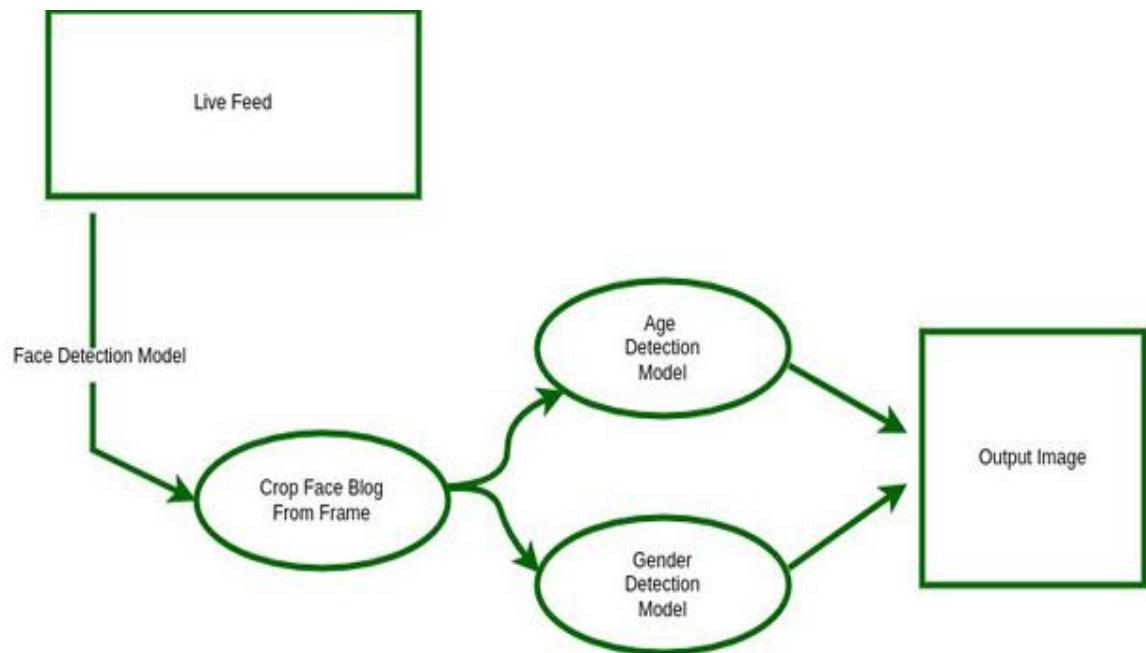
Diagram



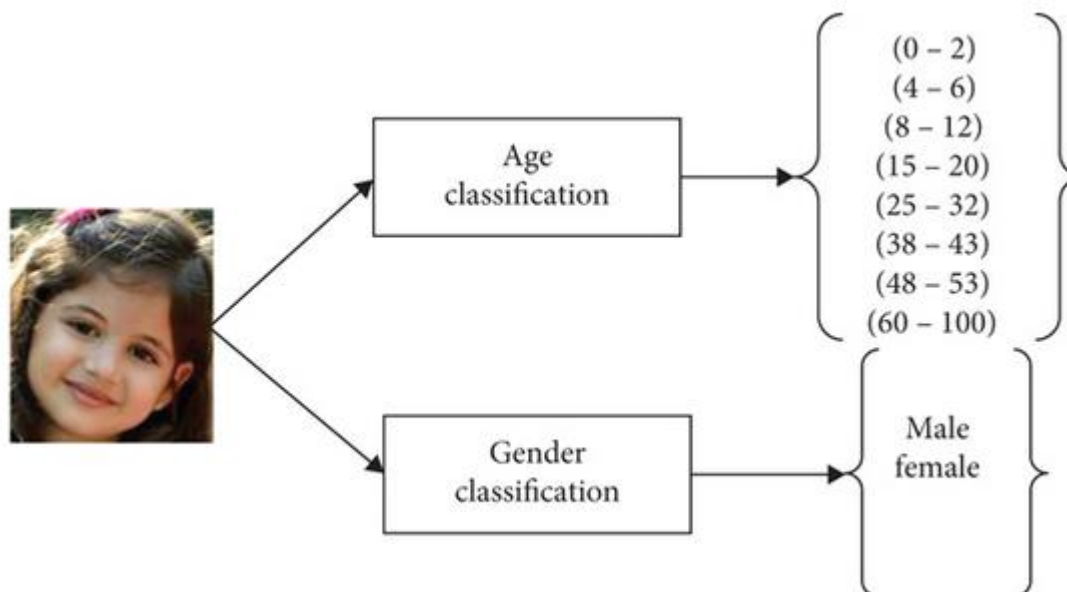
Description of the Dataset

The UTKFace dataset is a large-scale face dataset with over 20,000 images of faces from around the world. Each image is annotated with age, gender, and ethnicity information. The dataset is primarily used for training and evaluating machine learning models for tasks such as age and gender prediction. It is a useful resource for researchers in the fields of computer vision and machine learning. The images in the dataset are diverse and include a range of different ages, ethnicities, and genders. They are also captured in a variety of lighting conditions and poses, making the dataset suitable for training models that can generalize to a wide range of real-world situations.

Pre-trained model



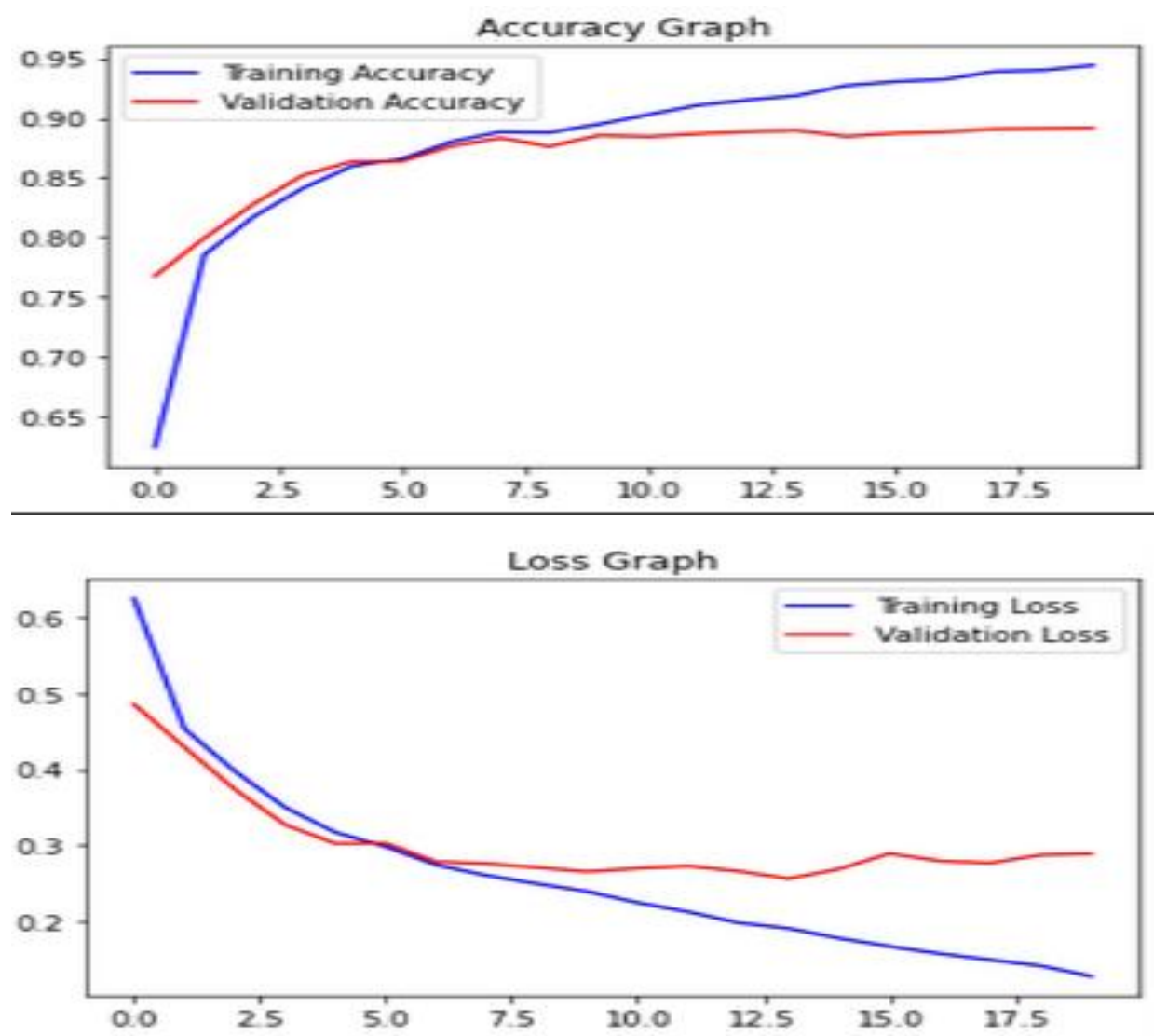
In this mainly regression model detect a gender and calculate the predication age and finally output



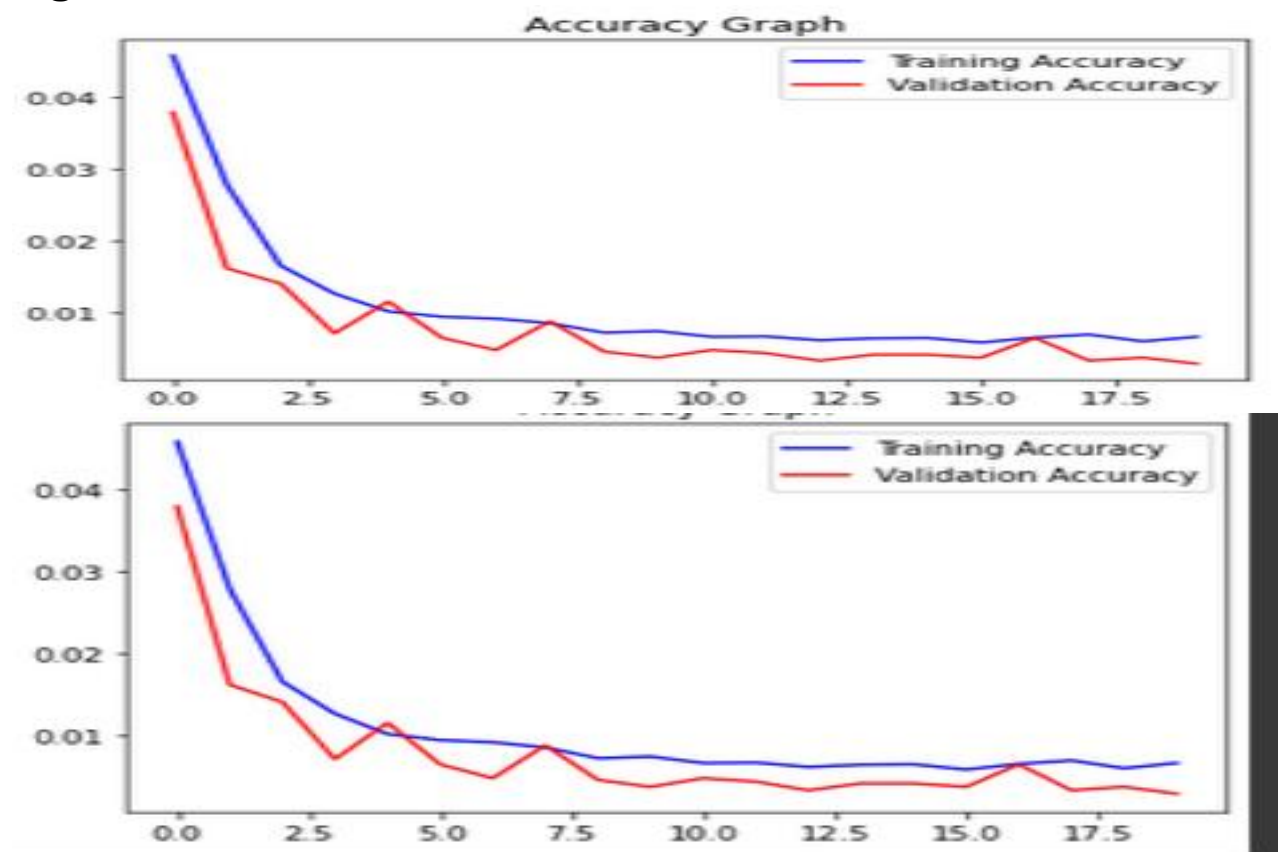
Second model classify gender and age and predict gender and image

Sample of the results

Gender



Age



So we Can Conclude that This model is accurate in gender more than age detection

Comparison between regression and classification

Classification is more accurate in gender and regression is more accurate in age

We search a model to apply classification in gender and regression in age

Future Work

There are several areas in which deep learning is likely to continue to play a significant role in the field of gender and age detection. Some potential areas of focus in the near future include:

- Improving the accuracy and robustness of deep learning models: Researchers are constantly working to improve the performance of deep learning models, and this is likely to continue in the field of gender and age detection. This may involve developing new model architectures, improving the training process, or finding ways to better handle variability in the data.

- Developing methods for handling bias and fairness: As with any machine learning system, it is important to ensure that deep learning models for gender and age detection are fair and unbiased. Researchers are likely to continue exploring ways to mitigate bias in the data and in the models themselves.

-Applying deep learning to new domains: Deep learning has already been applied to a wide range of tasks related to gender and age detection, but there are likely many more applications that have yet to be explored. For example, deep learning models might be used to predict the age and gender of historical figures or to analyze social media data to understand trends in gender and age demographics.

References.

<https://susanqq.github.io/UTKFace/>

<https://yadda.icm.edu.pl/baztech/element/bwmeta1.element.baztech-84712e83-5a0d-433d-b1c5-2c4b3fc4b92a>

<https://ieeexplore.ieee.org/abstract/document/9377041>