

Age and Gender Detection using CNN

Introduction :

Age and gender prediction from facial images play a vital role in various applications, including demographic analysis and personalized marketing. Leveraging convolutional neural networks (CNNs), this project aims to predict both age and gender from facial images, offering valuable insights for diverse industries.

Data Collection :

The dataset utilized in this project is sourced from the UTKFace dataset, comprising facial images accompanied by age and gender labels. Each image represents an individual, with the age label indicating the person's age and the gender label denoting their gender (male or female). The images are preprocessed and standardized to ensure consistency in model training.

Analysis :

❖ Data Exploration :

- Exploration of the dataset reveals the distribution of age and gender labels.
- Visualizations aid in understanding the characteristics of the data and the diversity of facial images.

❖ Model Architecture

- A CNN architecture is designed to extract features from facial images for age and gender prediction.
- The CNN comprises convolutional layers followed by max-pooling layers for feature extraction.
- Dense layers are incorporated for classification, with separate output layers for gender (binary classification) and age (regression) prediction.

❖ Model Training and Evaluation

- The model is trained on preprocessed facial images, with a validation split for assessing performance.
- Training metrics such as accuracy and loss are monitored to gauge model convergence and effectiveness.
- Evaluation metrics, including accuracy for gender prediction and mean absolute error (MAE) for age prediction, are utilized to evaluate model performance.

Conclusion :

The developed CNN model demonstrates promising results in predicting age and gender from facial images. With high accuracy in gender prediction and low MAE in age prediction, the model offers valuable insights for applications such as demographic analysis and personalized services. Further improvements and deployments can enhance the model's effectiveness in real-world scenarios.

