**Project Name:**

IMAGE-BASED AGE AND GENDER CLASSIFICATION WITH CONVOLUTIONAL NEURAL NETWORKS (CNN)

**Abstract**

**Problem Statement:**

Age and gender characteristics can be applied in various fields such as retail for contextual advertising for particular groups of customers. Our goal here is to create a program that will predict the gender and age of the person using an image. But predicting age might not be as simple as you think, why? You might be thinking that age prediction is a regression problem, right? And you would be right in thinking so. However, there are many uncertainties that researchers have faced when they treated this as a regression problem, like camera quality, brightness, climate condition, background, etc.

**Literature Survey:**

Abhijit Das, Antitza Dantcheva and Francois Bremond Mitigating Bias in Gender, Age and Ethnicity classification [1], they proposed a system using multi-task CNN approach which was ranked first in the BEFA challenge of European Conference on Computer Vision (ECCV). The model used by them was FaceNet and ResNet. The accuracy they got for race was 84%, gender was 94% and age was 72%.

Philip Smith, Cuixian Chen Transfer Learning with Deep CNNs for Gender Recognition and Age Estimation [2], in this they replaced the 1000 class predefined layer by ImageNet with a prediction layer of 101 classes for age prediction. In this the transfer learning is detected by the help VGG-19 and VGG-Face. MAE achieved 4.10 years which helped in improving the age estimation model. 96% accuracy was achieved with the help of VGG-19.

Sepidehsadat Hosseini, Seok Hee Lee, Hyuk Jin Kwon, Hyung Ii Koo and Nam Ik Cho Age and Gender Classification Using Wide Convolutional Neural Network and Gabor Filter [3], they used a wide CNN Gabor filter and the image input shaped to 227x227. The accuracy they got for age is 61% and gender is 88%

**Dataset:**

Image and text data from Kaggle and IBM websites

**Methodology (Proposed Solution):**

1. Load the Dataset
2. Exploratory Data Analysis
   1. Visualizing the data
3. Change age and gender mapping
4. CNN Model Creation
   1. Reading the images.
   2. Decode JPEG content into an RGB grid of pixels.
   3. Converting into Floating points tensors taking input to neural network
5. Age classification
   1. -Predicting the Age
6. Gender classification
   1. -Predicting the Gender
7. Plot the Model Results

**References:**

[1] Abhijit Das, Antitza Dantcheva and Francois Bremond Mitigating Bias in Gender, Age and Ethnicity classification.

Link:

<https://www.researchgate.net/publication/328031032_Mitigating_Bias_in_Gender_Age_and_Ethnicity_Classification_a_Multi-Task_Convolution_Neural_Network_Approach>

[2] Philip Smith, Cuixian Chen Transfer Learning with Deep CNNs for Gender Recognition and Age Estimation.

Link:

<https://arxiv.org/pdf/1811.07344.pdf>

[3] Sepidehsadat Hosseini, Seok Hee Lee, Hyuk Jin Kwon, Hyung Ii Koo and Nam Ik Cho Age and Gender Classification Using Wide Convolutional Neural Network and Gabor Filter.

Link:

<https://www.researchgate.net/publication/325495265_Age_and_gender_classification_using_wid_convolutional_neur%20al_network_and_Gabor_filter>

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