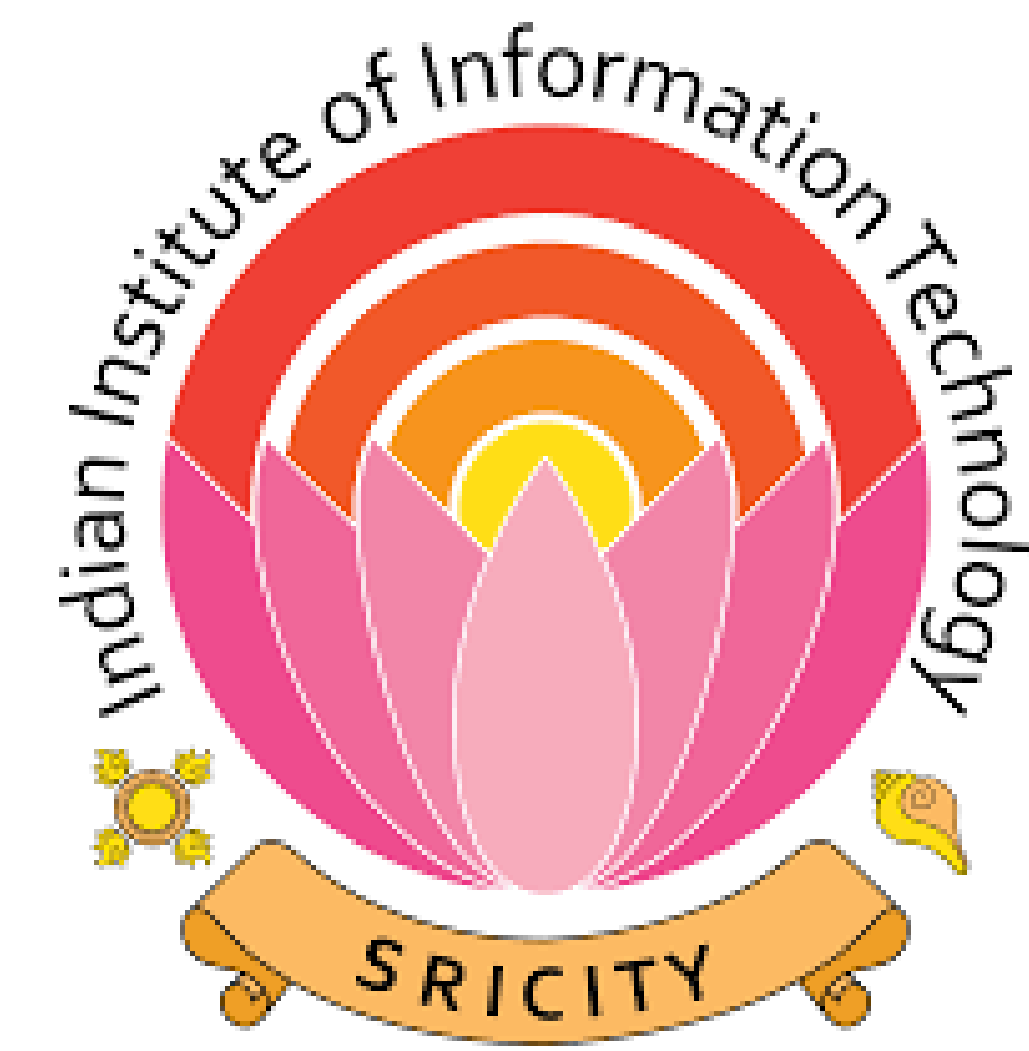


Gender & Age Classification

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Abstract

Now-a-days, Photos are being uploaded by everyone on social media platforms. Gender and Age Classifications, for the photos uploaded, are becoming popular in our day to day life. Our Project is an implementation of CNN Model which classifies the person in the image into gender and age. Our CNN can work even better with limited amount of dataset. Adience Benchmark is the dataset being used in our project.

Introduction

Our CNN Model consists of three convolution layers and two fully connected layers. Relu acts as activation function. Images are pre-processed before giving as Input. The network which we are implementing is shallow when compared with pre-existing networks. The reason for shallow is to prevent the over-fitting of the data. We assume the max age for a person is 100 and respectively defined a class.

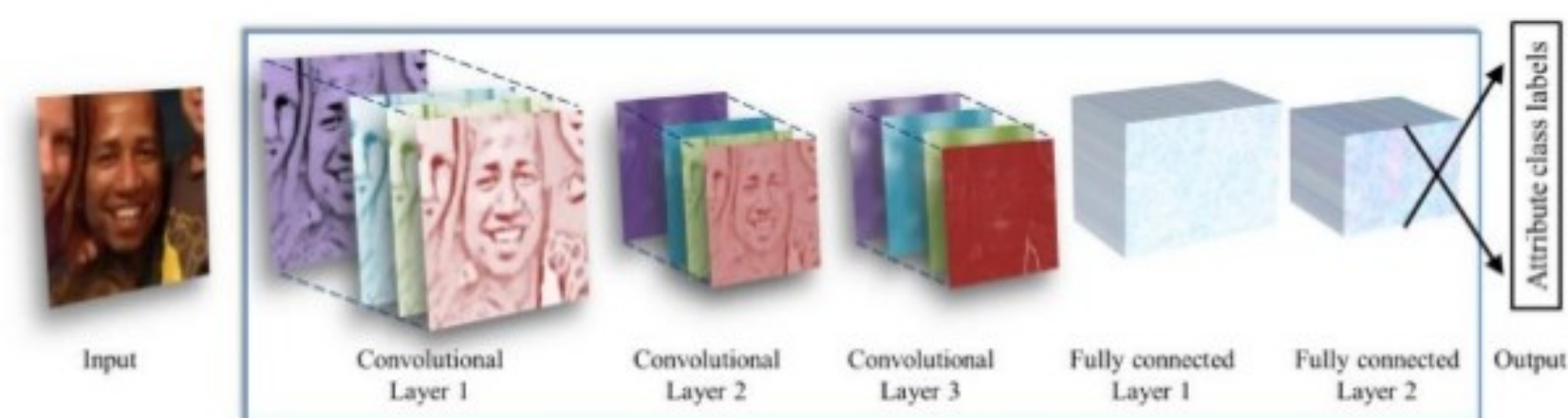


Figure 1: Architecture Preview

Dataset

Adience Benchmark consists of about 29K Images. It has 8 classes for age and 2 classes for gender. Dataset, which has been used for training the network, contains unconstrained images as many of them are existing with pose variation and motion blur.

- The classes for age are as follows (0, 2), (4, 6), (8, 12), (15, 20), (25, 32), (38, 43), (48, 53), (60, 100).
- The classes for gender are as follows M and F.

Our CNN Network

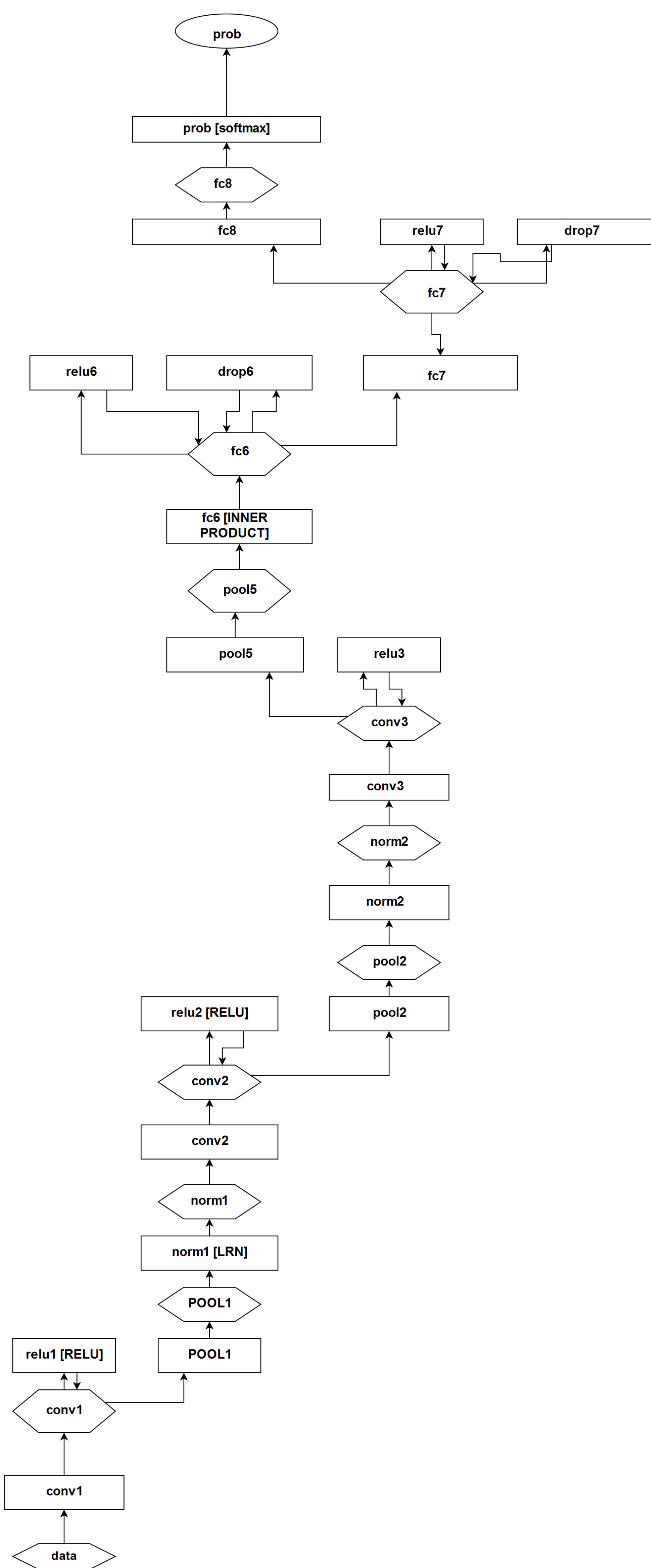
- Since Images are in 256 x 256 size, we have cropped into 227 x 227 size.



Figure 2: Input Images

- In the first convolutional layer, the image is multiplied 96 times with 3 x 7 x 7 size filter.
- Later, it is passed through ReLU Activation Function, followed by a max pooling layer of 3 x 3 size with stride value as 2.

- In the second convolutional layer, the previous layer's output is 96 x 28 x 28 is multiplied 256 times with 96 x 5 x 5 size filter. Later, it is again passed through RELU and a max pooling layer with same parameters as above.
- In the final convolutional layer, the output of previous layer is multiplied 384 times with 256 x 3 x 3 size filter. Later on, it is passed through ReLU Function and a max pooling layer.
- The first and foremost fully-connected layer which has 512 neurons gets input from third convolutional layer and later it is passed through ReLU and followed by a dropout layer.
- The second fully-connected layer underwent changes same as first fully-connected layer.
- The third fully-connected layer classifies into the output.
- The output from third FC Layer is passed through Soft-Max Layer to perform non-maxima suppression.
- Detailed Architecture is shown below:



Challenges Faced

1. Data-Preprocessing is long winded task.
2. Computational Time is higher for Training.
3. Many Images don't have gender and age labels.
4. Some Images are not labeled as class, instead given as integer.
5. Age Detection is not easy considering many factors. So We have been classifying the image.

Progress

- We have gone through the reference paper and built the model.
- We have acquired the output for some test cases in Gender.
- Presently, Working on Age Classification using constructed model.

Future Works

- Age Classification of Images.
- Performing both tasks i.e Gender and Age Classification on the given image.

Extensions

While in search of information about our project, we came to know that VGG Model can give higher accuracy than the present. So, We have decided to extend the work by including the vgg model in the project to acquire higher accuracy.

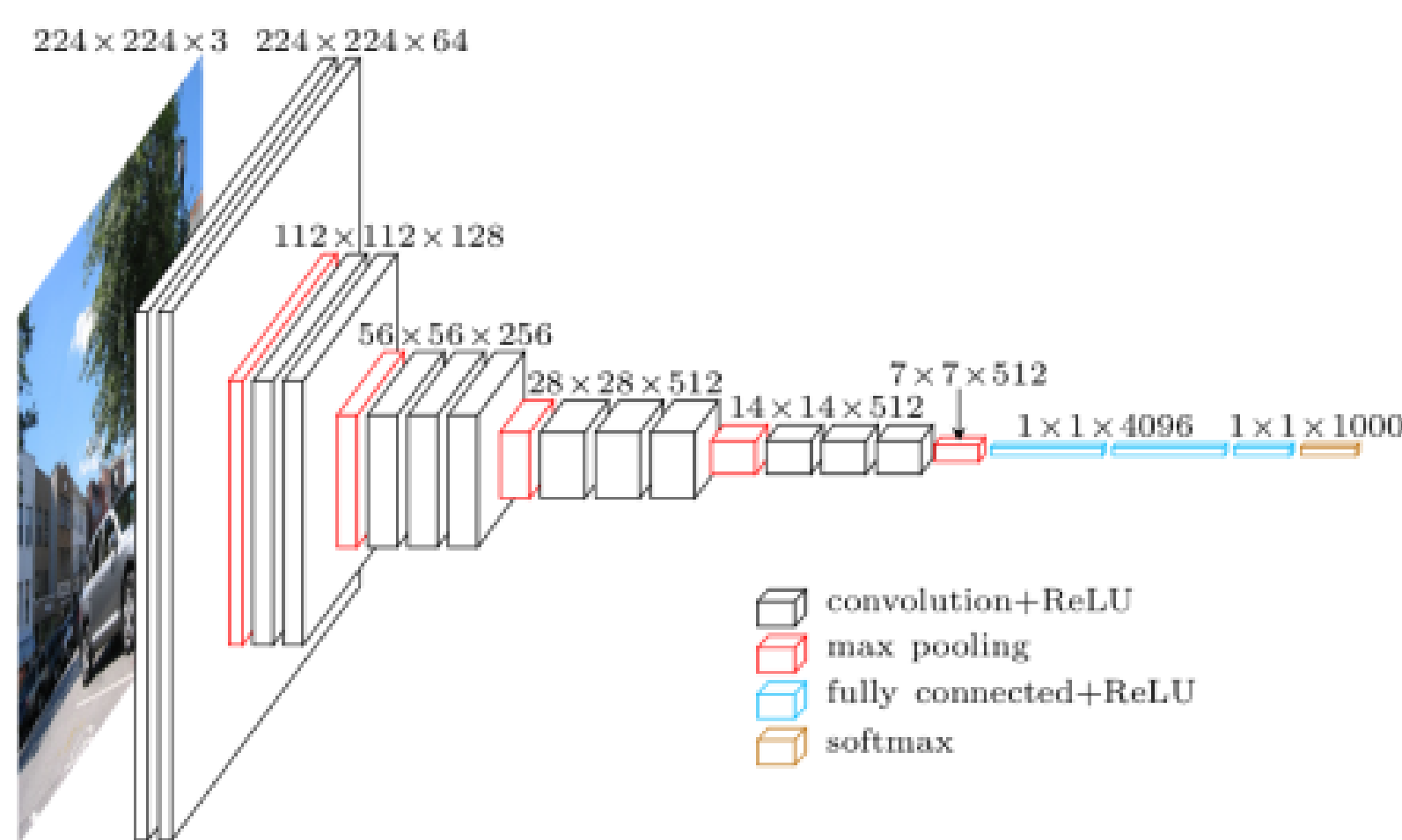


Figure 3: VGG Architecture

References

- [1] Gil Levi and Tal Hassner. Age and gender classification using convolutional neural networks. 2015.