Validation for Training DataSet

The original dataset was shuffled in order to separate it into two parts: the training set and the testing set. The size of the training set was 101500 samples and the size of testing set was 43500 samples.

We suppose that the neural network output for an input x is labeled by $NN[x]$ and the actual answer is labeld bu $y[x]$. We suppose as well that the n is the size of the training dataset.

The precision for the training test is defined as follow:

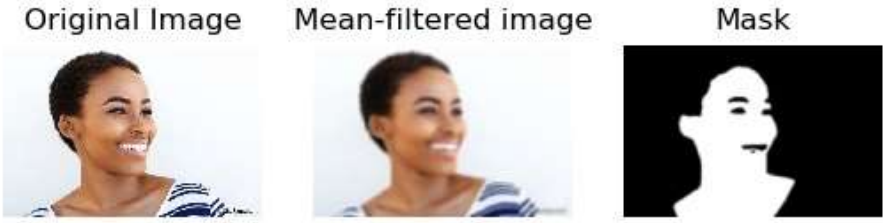
$$Precision = \frac{1}{n}\sum_{i=1}^{n} f\big(y[x_i](1 - NN[x_i])\big) + f(\,(y[x_i] + 1)NN[x_i]\,)$$

Where :

$$f(x) = \begin{cases} 1, if\ x < 0.1 \\ 0, otherwise \end{cases}$$

Taking the definition above, the precision obtained was 99.7%, which show that the Neural Network can identify several color skin tones.

Below, we show the result of the neural network skin color identificiation for some images. It's important to say that after the mask calculation, a gaussian filter has been applied in order to smooth the border. There are some little holes in the mask which can lead to te conclusion that the network could be better trained for a lerger dataset. However, these small imperfection could corrected for some dilation algorithm, which would be less expensive in computational terms.



Original Image Mean-filtered image Mask

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