Gender Recognition from Face Images

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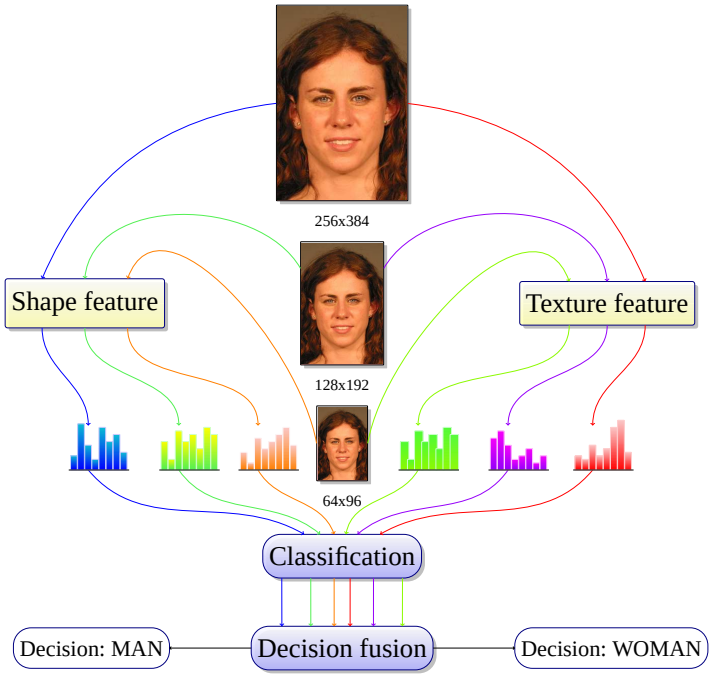
Gender recognition

???

MAN or WOMAN

Multiscale approach



Fusing obtained decisions from just a single feature on different image resolutions can have comparable recognition accuracy like classical aproach, i.e. fusing different features on a single scale.

Shape feature

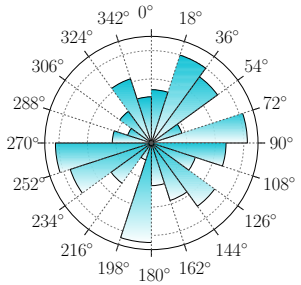
For each pixel, the edge map direction is found using:

$$\theta = tan^{-1}\left(\frac{v}{h}\right) \quad (1)$$

and the weighted vote (in this case an intensity) is obtained with:

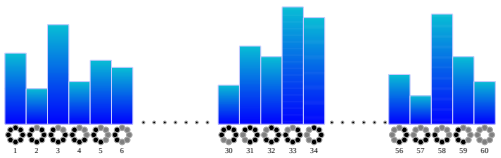
$$m = \sqrt{v^2 + h^2} \quad (2)$$

For each pixel a weighted vote obtained from (2) is accumulated into orientation bins over a region called window. It means in that case that each pixel adds its edge magnitude m to the bin that corresponds to its edge direction θ. The orientation bins are discretized to 18 degrees intervals, such that the histogram contains 20 bins to cover the full range of 360 degrees.

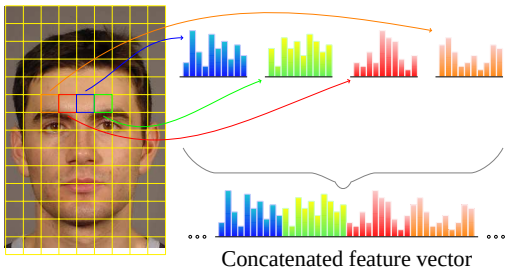


Texture feature

The method is based on recognizing certain local binary patterns termed ”uniform”, what refers to a uniform property appereance in local binary pattern, i.e., there is a at most two transitions from 0 to 1 or 1 to 0, considering the code circularly.



Sliding windows



Concatenated feature vector

Final feature vector is obtained by concatenating feature vectors from all windows in the image.

Results

The experiments were performed on two publicly available datasets: FERET and UND:

Fusion	FERET	UND
64x96	95.50	94.58
128x192	94.38	95.18
256x384	94.38	93.97
Shape	95.50	93.37
Texture	92.13	95.78
All	**96.06**	**95.78**

When comparing the results obtained by fusing the decisions from two features at a given image size (lines 1, 2 and 3) with the results obtained by fusing decisions from different image sizes for each feature type (line 4 and 5) it can be seen that these aproaches are quite competitive.

This points to the fact that the information from different scales, even if just from a single feature, can be as much important as different features at a single scale.