Report – Image Processing Final Project

Stage 0

Repository was created, corresponding images have been downloaded.

Stage 1

1. Frontal Images have been processed with Binary Layers, as a result it was discovered that 3 (189,190,191) of them has standard behavior, 2 (188,192) of them has non-standard behavior. At this stage only standard-behavior images has been used.
2. Different filters have been applied, as a result it was discovered that for smoothing, the best perform median and mean, which were applied to layers for better results.
3. Based on the experiments from above, the new optimal filter was constructed, which was a combination of median and mean. After matrix processing it has the following values, which also made the images as smoother and well defined as in previous step :

-1 -1 -1 -1 -1

-1 -1 -1 -1 -1

-1 -1 -1 -1 -1

-1 -1 -1 -1 -1

-1 -1 -1 -1 -1

1. Dependence of the extracted regions on Binary Layers on the head rotations and smile were investigated using left-turn, right-turn, smiling images. Orientation and Eccentricity values were counted and uploaded. The code Moments.java was derived from Amalya Hayrapetova.
2. All results from each step are uploaded in Github.

Stage 2

1. To ensure the Standard Behavior, the color of a face image may be calibrated , for that purpose a standard behavior image was taken from assigned images and Normalized Cumulative Histogram was computed for each R, G, and B channel separately. Code for computing normalized cumulative histograms was derived from Amalya Hayrapetova. All results are uploaded.
2. The cropped versions of the remaining frontal images were downloaded from the dataset their Normalized Cumulative Histograms for each R, G, and B channel separately was computed, and they were matched with the Benchmark Histogram. For matching, code was derived from Maro Grigoryan’s Github account.
3. Binary layers were extracted on the matched images.
4. Steps 1,2,3 were repeated for HSV channels. For computing normalized cumulative histograms for HSV code was derived from Tatevik Tovmasyan’s Github account. For matching, code was derived from Maro Grigoryan’s Github account.
5. As a result, both after RGB matching and after HSV matching behavior of images became better. Both initially Standard-behavior and non-Standard behavior images were performing good.

Stage 3

I hope, that AOOP Final Project may be counted as Stage 3 for this project, which is already uploaded in github.

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