

ECE 558 PROJECT REPORT - Pyramid Blending (Question 1)

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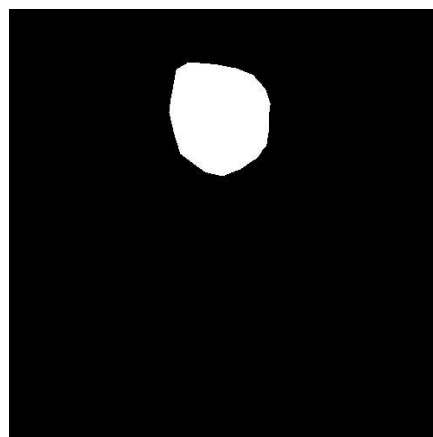
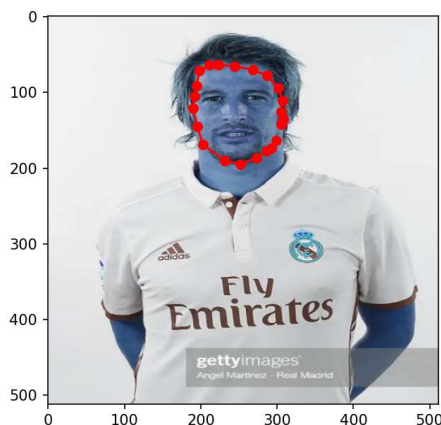
(a) Implemented a function **ComputePyr()** which takes input image and num_layers as input arguments and returns the laplace and gaussian pyramids. We check if the number of pyramid levels are feasible or not and only then proceed.

1. Gaussian kernel was used to smoothen the image and the sigma is fine tuned as per the input image, manually and will be varied at every level of blurring in the pyramid.

2. The downsampler and the upsampler use simple nearest neighbor interpolation.

(b). The GUI to create the binary mask was implemented with the roipoly library which gave us the flexibility to select the contours on the image enabling seamless blending of images.

Once the ROI is obtained, every pixel value inside the ROI is set to 1(binary) and the rest to 0 to obtain the binary mask.



(c). Implemented the **blend function** and wrote a function to reconstruct the final blended image from the blended pyramid. Tested the blending on three different pairs of images.

Sigma tuning ensures smooth blending. This can be done by varying **sigmaStepSize** in the source code. At every level of pyramid blending, we vary sigma (increase for downsampling and decrease for upsampling). Blend takes the product of the binary mask and the source image (to get the portion to be inlaid into the target) and the product of the target with the inverse of the mask to get everything else in the target image and this blended pyramid of images are used for reconstruction to obtain the final blended image.

Test Results:

We have run the code on three different pairs of images at the optimum sigmas. Refer folder for mask images.

Pair 1: Luis Suarez + Ivan Rakitic



Pair 2: Beatles at Chandni Chowk (India tour circa 1962)



Pair 3: Fabio Coentrao + CR7



Contribution:

We have put in equal effort into this project with Kriti working on the Gaussian Pyramid and blurring. Nitin worked on the ROI capture, Laplacian Pyramid and reconstruction and sigma tuning for optimal blending. We are not competing for extra credits.