CS4475 - Assignment 5

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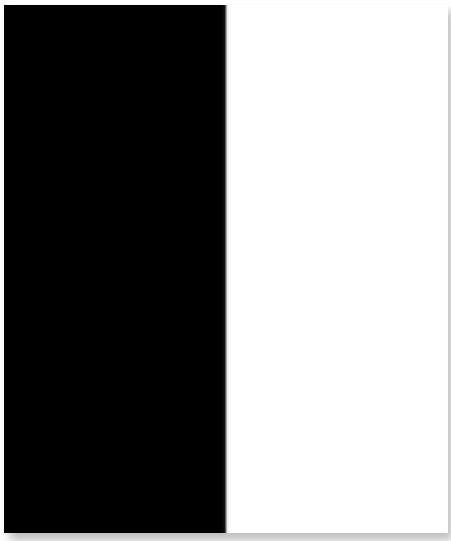
For this assignment, I chose to do a blend with portraits, so I looked on google and the first few results were of President Obama and Putin. I was curious on what kind of final image would be produced with these two people of different nationality and race, and was able to deduce facial architecture differences between the two people. As you can see below, I edited the two images (black and white) to align their faces and scale appropriately to match the head size. However, the final image was not aligned perfectly because they both had different face proportions. We could see that Putin's nose was longer and his chin was shorter than Obama's. While this image could cause political conflict? on the internet, this was an interesting result to see.



FUNCTIONS

Reduce

For this problem, I used the convolve2d function from scipy, and used an array splice to get the reduced image.

Expand

For this problem, I also used convolve2d function, but in order to expand, I created a new array twice the size, and assigned every other row/column to the image. I had to multiply the values by 4 because when expanding twice in row and twice in column, the image gets darker by 4 times, so I need to multiply by 4 to lighten it back up.

Gaussian Pyramid

For this problem, I used the reduce function I wrote earlier and appended it to the output for each level.

Laplacian Pyramid

For this problem, I used the expand function I wrote earlier and appended it to the output for each level. I had to crop the expanded array to match the size of the gaussian pyramid. Also, for the last element, I just copied the last layer of the input pyramid since it cannot be subtracted anymore.

Blend

For this problem, I used the equation output[i,j] = current_mask[i,j] * white_image[i,j] + (1-current_mask[i,j]) * black_image[i, j], to get the output image for each level of the pyramid. I appended this result to the blended pyramid and returned it.

Collapse

For this problem, I started at the smallest layer of the pyramid, expanded the smallest layer and added it to the second to smallest layer and repeated until the largest image.