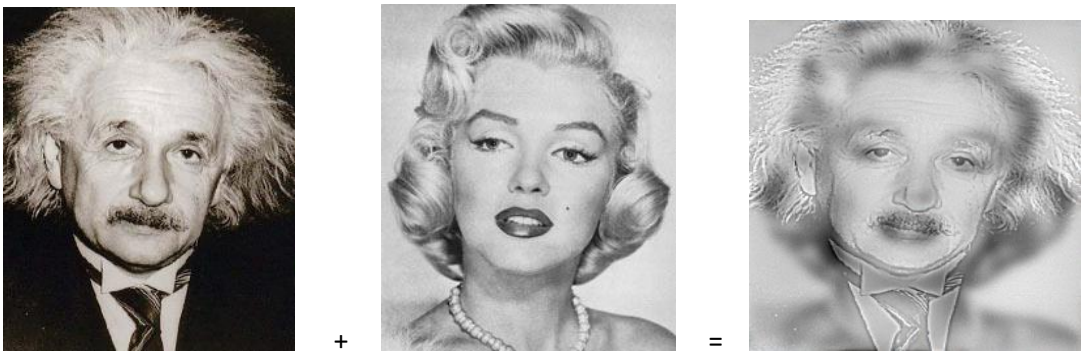
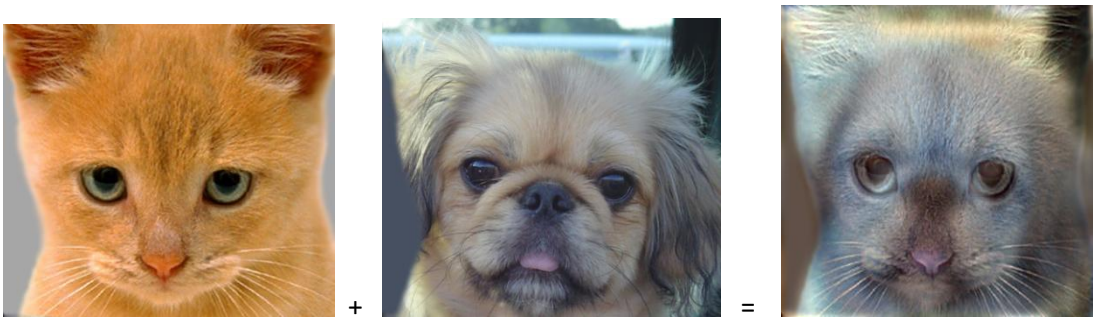
HYBRID IMAGES

INPUT - OUTPUT:





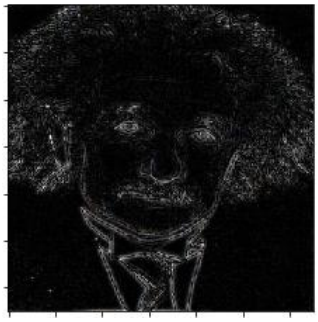
Step 1: Read images using imread and resize them to a particular size. Split them into r,g,b channels.

Step 2: Apply Fourier Transform to all 3 channels of both images separately.

Step 3: Generate Gaussian HighPass Filter and Gaussian LowPass Filter with threshold alpha and beta as sigma values respectively.

Step 4: Multiply fourier transform of each channel of image with corresponding Gaussian Highpass filter/Gaussian LowPass filter in Frequency domain.

For example, consider hybrid image generation of einstein and marilyn image.



The above are images of einstein Highpasses and marilyn Lowpassed.

Alpha beta values used are , alpha=25 and beta =10

Alpha is threshold for highpass filter and beta is threshold for low pass filter.

If value is greater than alpha , pass it (Highpass) . If value is less than beta,pass it (Lowpass).

Step 5: Now apply Inverse Fourier Transform for each output of above step.

Step 6: Add r channels of HighPass output and LowPass Output. Add g channels of HighPass output and LowPass Output. Add b channels of HighPass output and LowPass Output. Store them separately.

Step 7: Combine these resultant r,g,b matrices to get final output Hybrid Image.

In resultant image , we can observe sharp(highpass) features of einstein image and blur(lowpass) features of marilyn image.

- ➔ If alpha value is increased keeping beta unchanged , then sharp features of highpassed image kept decreasing . As a result lowpassed image is more visible than highpassed image.
- ➔ If alpha value is decreased keeping beta unchanged , then sharp features of highpassed image kept increasing . As a result lowpassed image is very less visible . Highpassed image is dominating.
- ➔ If beta value is increased keeping alpha unchanged , then sharpness lowpassed image kept increasing . As a result lowpassed image is more visible than highpassed image. Sharp features of highpassed image decreased.
- ➔ If beta value is decreased keeping alpha unchanged , then sharpness lowpassed image kept decreasing, that is image becomes even more blur . As a result lowpassed image is less visible than highpassed image.
- ➔ If both values , alpha and beta are changed simultaneously , if increased , lowpassed image is more visible. If decreased highpass image is more visible.