

DIGITAL IMAGE PROCESSING

EXPT-7

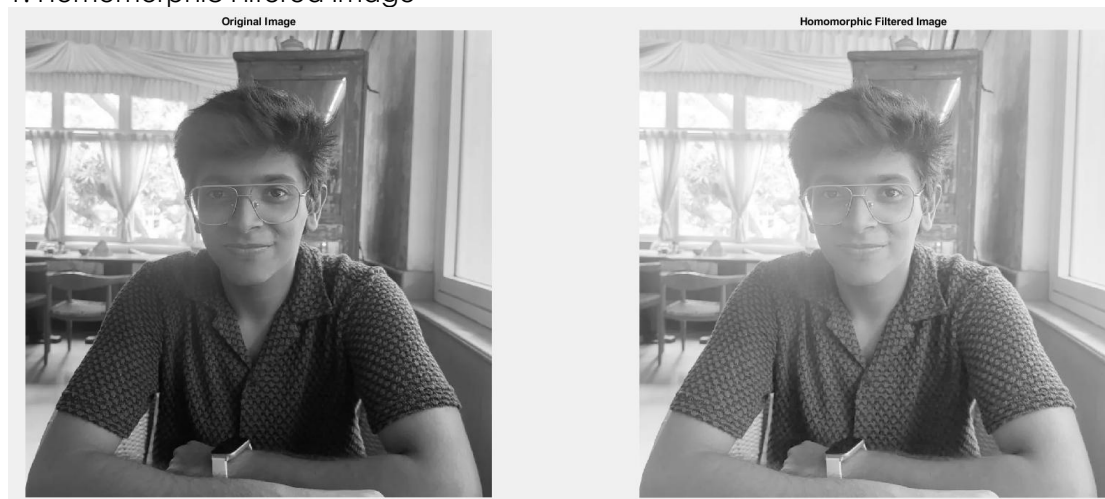
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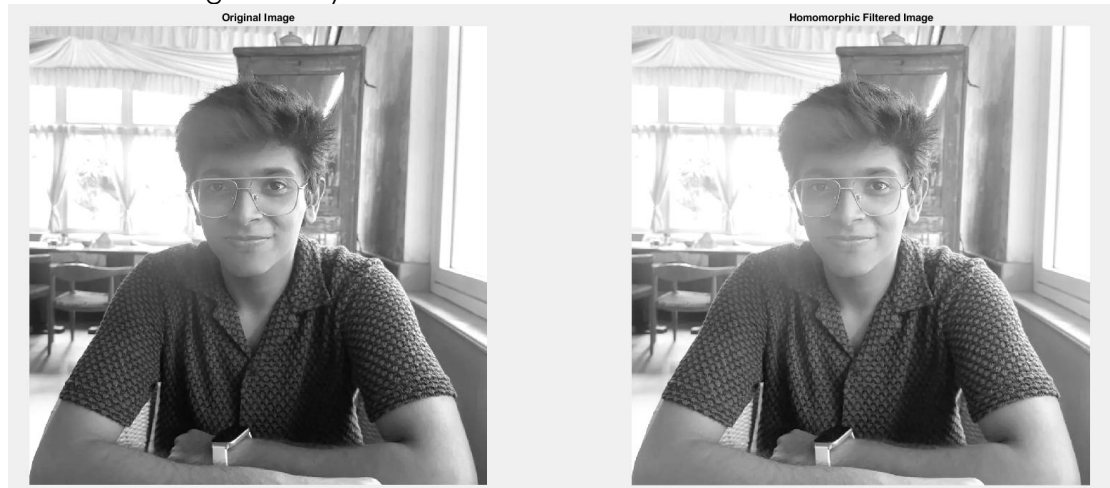
Design and implement a homomorphic filtering technique using MATLAB to enhance the contrast of low-light images. Evaluate the effectiveness of your implementation by applying it to a variety of images with different lighting conditions.

```
clc;
close all;
clear all;
d = 10; % Cutoff frequency
d2 = d^2; % Square of cutoff frequency
f = double(rgb2gray(imread('C:\Users\apoor\Downloads\WhatsApp Image 2024-09-03 at 21.33.04.jpeg')));
%f = f - 90;
%f = max(min(f, 255), 0);
l = log(1 + f); % Logarithmic transformation
z = fft2(l);
[m, n] = size(f);
b = zeros(m, n);
h = zeros(m, n);
for i = 1:m
    for j = 1:n
        b(i, j) = sqrt((i - m / 2)^2 + (j - n / 2)^2); %euclidian distance
        h(i, j) = exp(-b(i, j)^2 / (2 * d2)); % Gaussian filter
    end
end
L = 0.5; % Gamma low value
H = 1.5; % Gamma high value
filter = L + (H - L) * h;
s = z .* filter;
g = abs(iff2(s)); %inverse fourier transformation
e = exp(g) - 1; %inverse the logarithmic transformation
subplot(1, 2, 1);
imshow(f, []);
title('Original Image');
subplot(1, 2, 2);
imshow(e, []);
title('Homomorphic Filtered Image');
```

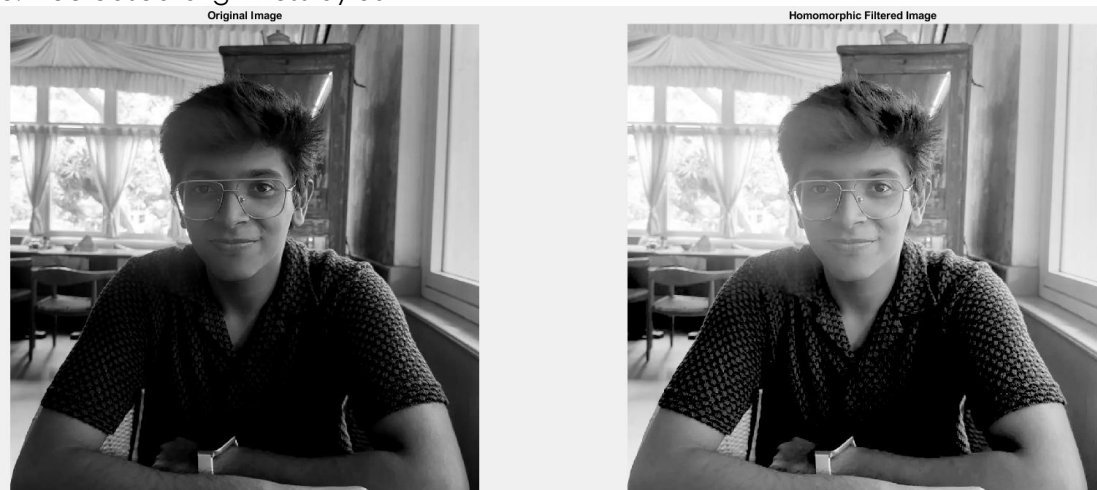
1. Homomorphic Filtered Image



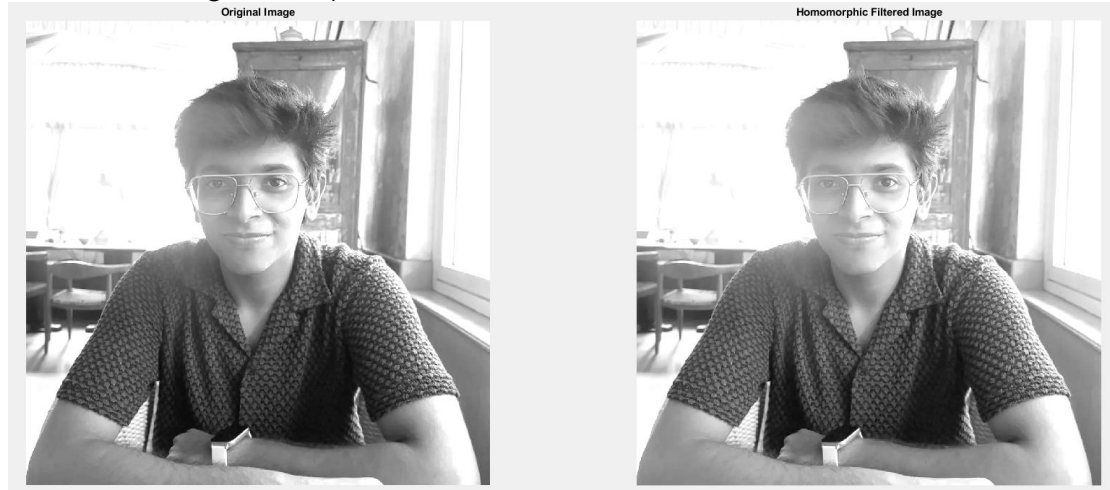
2. Increased brightness by 50



3. Decreased brightness by 50



4. Increased brightness by 90



5. Decreased brightness by 90

