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```
% Create and show the new image resulting from removing the phase
% components for
% each the following input images separately: (dog), (motorcycle), and
% (submarine).
clear; close all; clc;
```

## Images

```
tic;
disp('Display images');
im1 = imread('./data/dog.bmp');
im1 = imresize(im1,[360, 410]);
im1 = double(im1)/255;
im1 = rgb2gray(im1);
toc;

im2 = imread('./data/motorcycle.bmp');
im2 = imresize(im2,[360, 410]);
im2 = double(im2)/255;
im2 = rgb2gray(im2);
toc;

im3 = imread('./data/submarine.bmp');
im3 = imresize(im3,[360, 410]);
im3 = double(im3)/255;
im3 = rgb2gray(im3);
toc;
disp(' ');

Display images
Elapsed time is 0.011072 seconds.
Elapsed time is 0.020707 seconds.
Elapsed time is 0.042132 seconds.
```

## Frequency Domain

```
tic;
disp('Frequency Domain');
F1 = fftshift(fft2(double(im1)));
```

---

```
F2 = fftshift(fft2(double(im2)));
F3 = fftshift(fft2(double(im3)));
toc;
disp(' ');
```

```
% Magnitude
tic;
disp('Magnitude');
F1_Mag = abs(F1);
F2_Mag = abs(F2);
F3_Mag = abs(F3);
toc;
disp(' ');
```

```
Frequency Domain
Elapsed time is 0.012149 seconds.
```

```
Magnitude
Elapsed time is 0.002962 seconds.
```

## Neutralize Phase

```
tic;
disp('Neutralize Phase');
F1_Phase = exp(1i*0);
F2_Phase = exp(1i*0);
F3_Phase = exp(1i*0);
toc;
disp(' ');
```

```
Neutralize Phase
Elapsed time is 0.000275 seconds.
```

## Reconstructin

```
tic;
disp('Reconstruct');
Reconstruct1 = log(abs(ifft2(ifftshift(F1_Mag.*F1_Phase)))+1);
Reconstruct2 = log(abs(ifft2(ifftshift(F2_Mag.*F2_Phase)))+1);
Reconstruct3 = log(abs(ifft2(ifftshift(F3_Mag.*F3_Phase)))+1);
toc;
```

```
Reconstruct
Elapsed time is 0.022922 seconds.
```

## Display reconstructed images

```
tic;
disp('Display Final Images');
figure;
```

---

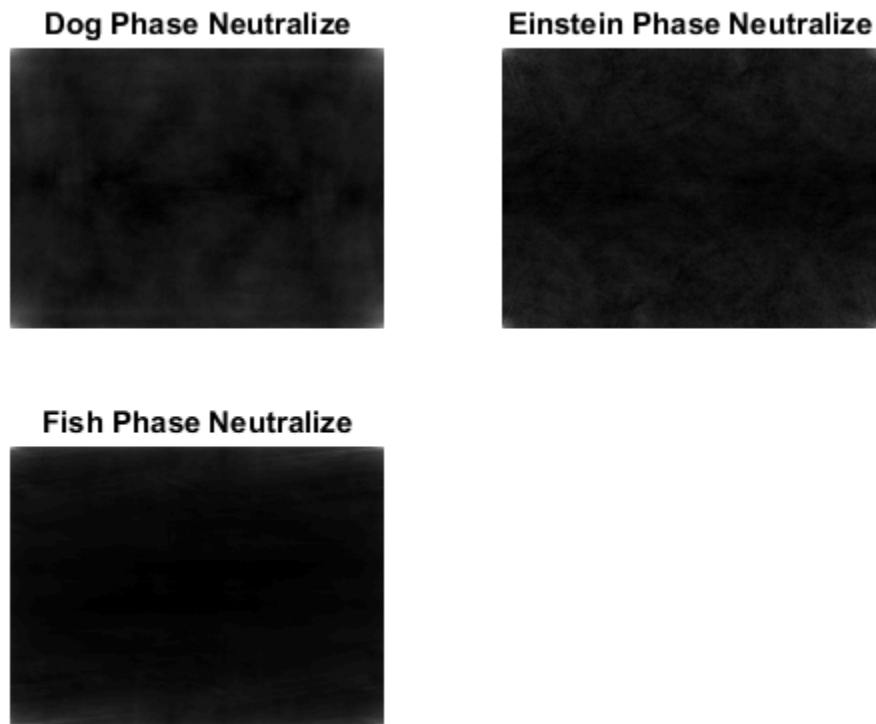
```
subplot (2,2,1), imagesc(Reconstruct1), colormap gray, axis off,  
    title('Dog Phase Neutralize');  
toc;  
subplot (2,2,2), imagesc(Reconstruct2), colormap gray, axis off,  
    title('Einstein Phase Neutralize');  
toc;  
subplot (2,2,3), imagesc(Reconstruct3), colormap gray, axis off,  
    title('Fish Phase Neutralize');  
toc;
```

*Display Final Images*

*Elapsed time is 0.061337 seconds.*

*Elapsed time is 0.077263 seconds.*

*Elapsed time is 0.094900 seconds.*



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