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```
% Author: Nick DeMarco
% Hybrid Image

clc;
clear;
close all; % closes all figures
```

Setup

```
image1 = imread('fish.bmp');
image2 = imread('motorcycle.bmp');

image1 = imresize(image1,[307 453]);
image2 = imresize(image2,[307 453]);

figure('Name', 'Original
Images','NumberTitle','off');imshowpair(image1, image2, 'montage');
title("Original Images");

image1double = double(image1)/255;
image2double = double(image2)/255;

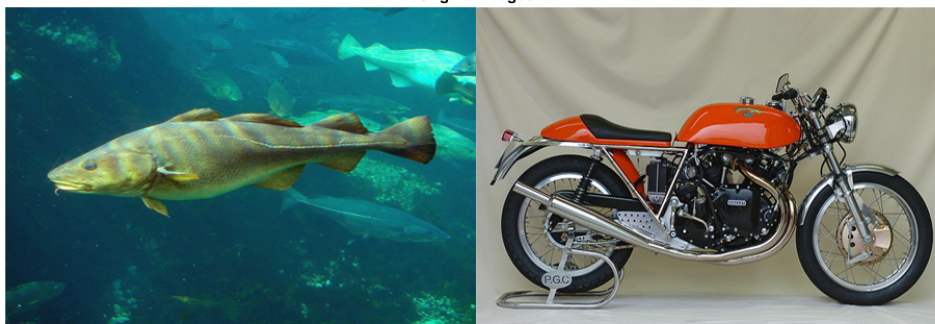
im1 = rgb2gray(image1double);
im2 = rgb2gray(image2double);

figure('Name', 'Grayscale Images','NumberTitle','off');imshowpair(im1,
im2, 'montage');
title("Grayscale Images");

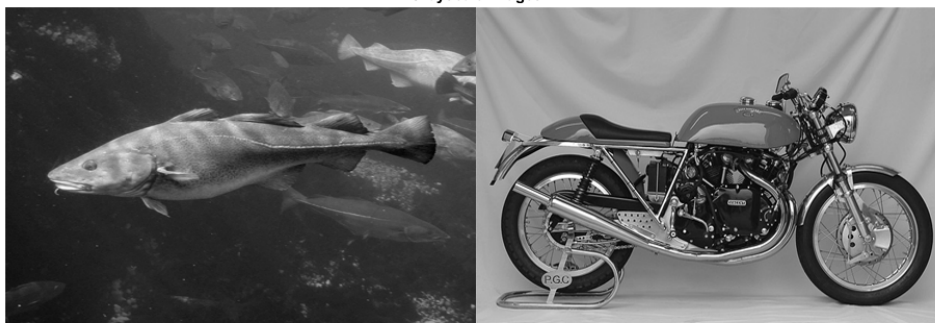
[im1h, im1w] = size(im1);
[im2h, im2w] = size(im2);

rows = max(im1h, im2h);
cols = max(im1w, im2w);
```

Original Images



Grayscale Images



Take the FFT of the two images

```
im1_FFT = fft2(im1, rows, cols);  
im2_FFT = fft2(im2, rows, cols);
```

Find magnitude and phase of the two images

```
mag1 = abs(im1_FFT);  
mag2 = abs(im2_FFT);  
  
phase1 = angle(im1_FFT);  
phase2 = angle(im2_FFT);
```

Recompute the frequency

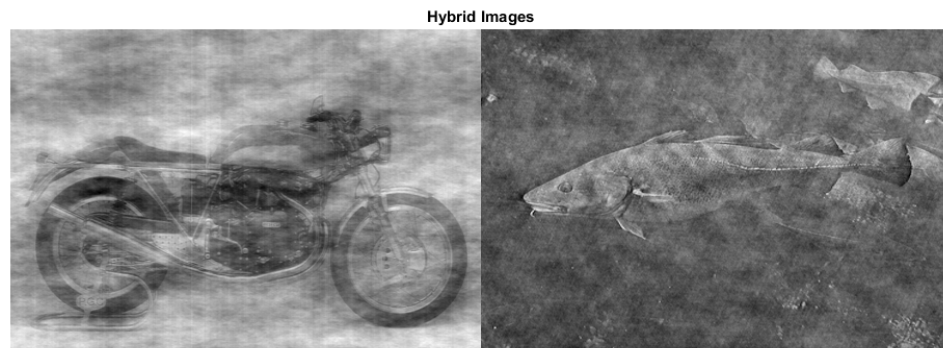
```
output1 = mag1 .* exp(1i*phase2);  
output2 = mag2 .* exp(1i*phase1);
```

Find inverse images

```
inv1 = real(ifft2(output1));  
inv2 = real(ifft2(output2));
```

Display New Hybrid Images

```
figure('Name', 'Hybrid Images','NumberTitle','off');imshowpair(inv1,  
    inv2, 'montage');  
title("Hybrid Images");
```



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