Assignment Project #1 “Hybrid Image”

Name: Yunfeng Wei
CWID: 10394963
E-mail: ywei14@stevens.edu

Report:

1. In this project, I choose the following picture as the foreground image as Figure 1.1. The foreground picture is a tiger’s face.

Figure 1.1

2. Then I choose the following picture as the background image as Figure 2.1. The background picture is a dog’s face.

Figure 2.1

3. Next, use the fspecial() function to define two Gaussian filters as Figure 3.1. One is for the foreground picture and the other is for the background picture. The Gaussian filter is a low-pass filter, so we can use to blur the background image as Figure 3.2. Also, we can use the Gaussian filter to smooth the foreground image by making the original image subtracts the blurred image filtered by the Gaussian filter as Figure 3.3.

```
frequency = 50;
frequency_back = 10;

fGaus = fspecial('gaussian', frequency*4+1, frequency);
bGaus = fspecial('gaussian', frequency_back*4+1, frequency_back);
```

Figure 3.1

```
% Gaussian for background image
bgFilterI = imfilter(bgI, bGaus, 'replicate');
```

Figure 3.2

```
% Laplacian for foreground image
fgFilterI = fgI - imfilter(fgI, fGaus, 'replicate');
```

Figure 3.3

4. Because the background image size is 1266 x 946, and the foreground image size is 1266 x 944. So we resize the foreground image size to 1266 x 946 as Figure 4.1.

```
fgNewFilterI = uint8(zeros(946,1266,3));
for i=1:3
    for j=1:1266
        for k=1:944
            fgNewFilterI(k,j,i)=fgFilterI(k,j,i);
        end
    end
end
```

Figure 4.1

5. The filtered foreground image and background image is shown as Figure 5.1 and Figure 5.2.

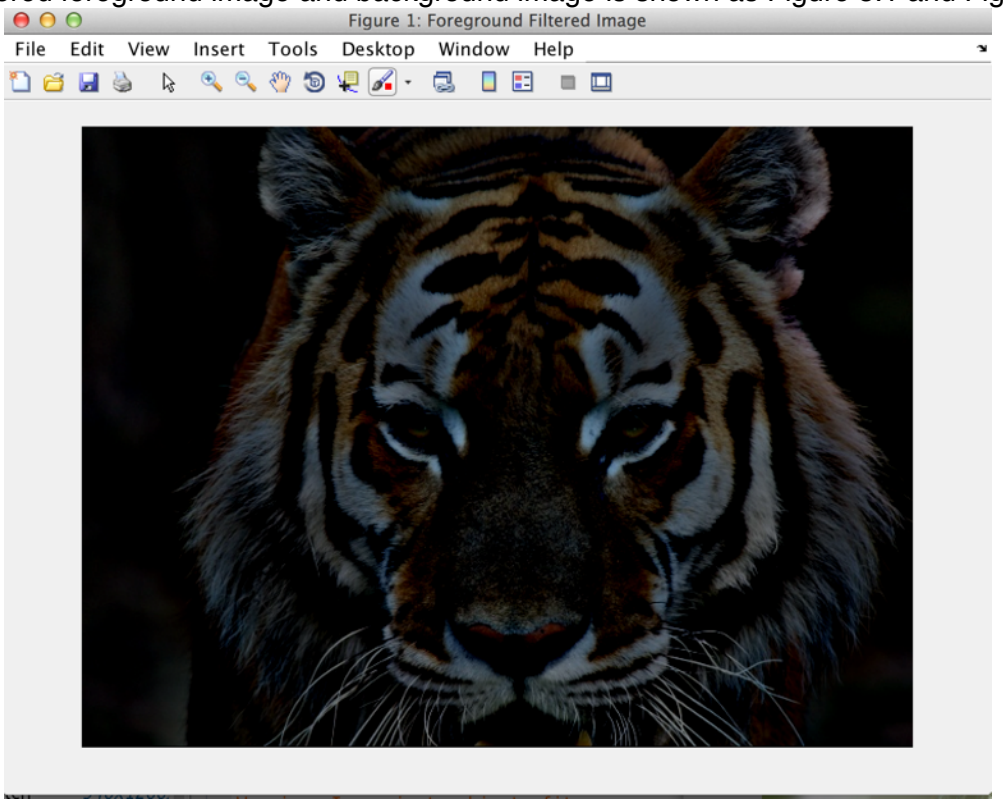

Figure 5.1

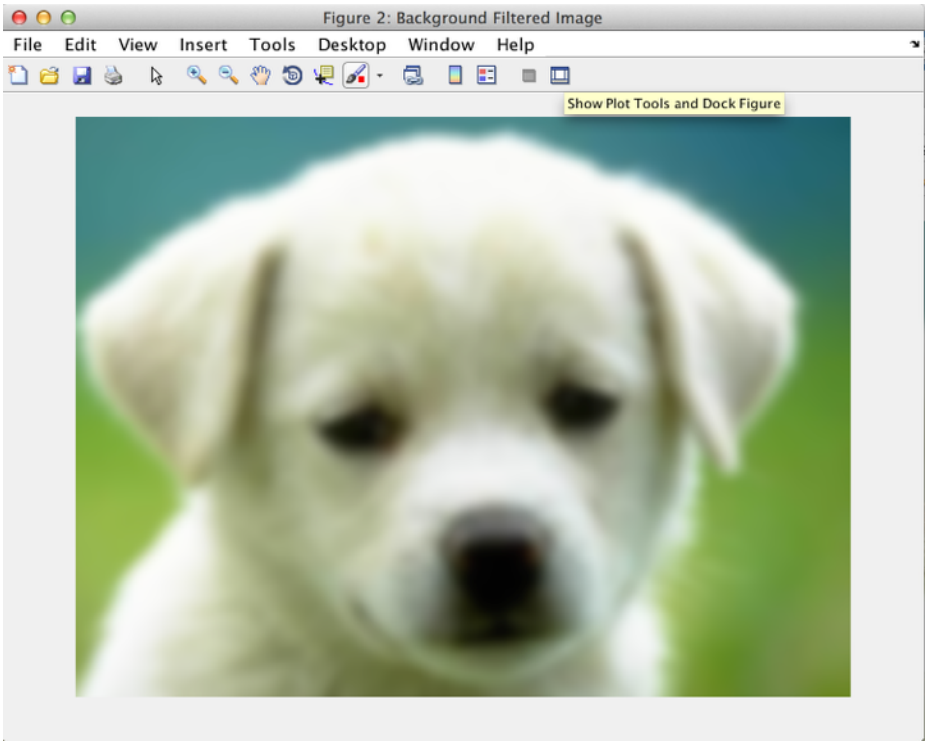

Figure 5.2

6. Finally, hybrid the filtered foreground image with the filtered background image, and the final result is shown as Figure 6.1. A dog with a tiger's face is created!

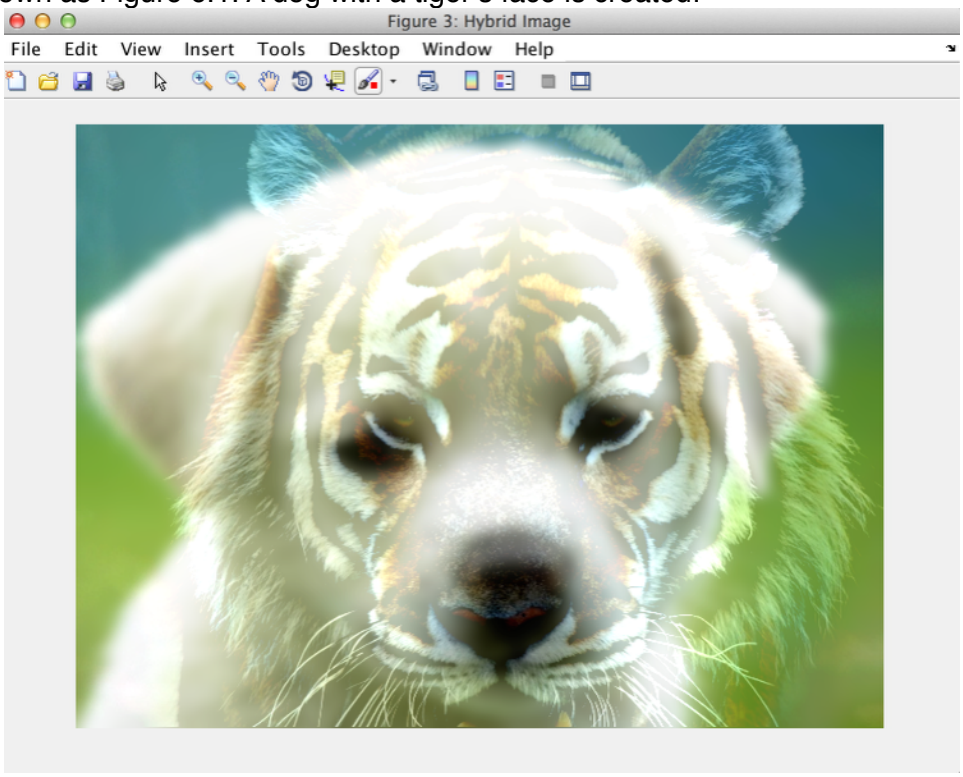

Figure 6.1