

Lab 8

CPS592 – Visual Computing and Mixed Reality

Objective

- Implement Seam Carving to resize the image



Preparation

- Open MATLAB
- Create Lab8 folder
- Copy *flower.jpg*, *middle.jpg* to Lab8 folder

Use the saliency function from Lab 7

```
function [ sm ] = saliency( img )  
%SALIENCY Summary of this function goes here  
  
gaussian_kernel = fspecial('gaussian', [10 10], 5);  
img_gaussian = imfilter(img, gaussian_kernel, 'replicate');  
  
% Perform RGB to Lab color space conversion  
lab = rgb2lab(img_gaussian);  
  
% Compute Lab average values  
l = double(lab(:,:,1)); lm = mean(mean(l));  
a = double(lab(:,:,2)); am = mean(mean(a));  
b = double(lab(:,:,3)); bm = mean(mean(b));  
  
% Compute the saliency map  
sm = (l-lm).^2 + (a-am).^2 + (b-bm).^2;  
  
end
```

Create new script “Lab8.m”

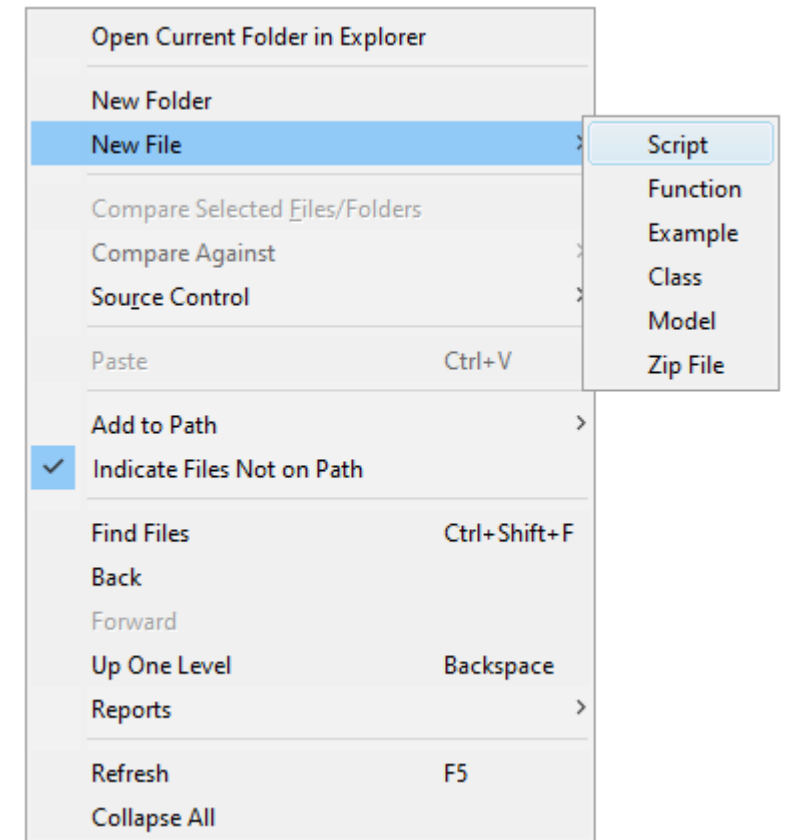
```
clear all;
```

```
close all;
```

```
clc;
```

```
img = imread('flower.jpg');
```

```
figure, imshow(img);
```

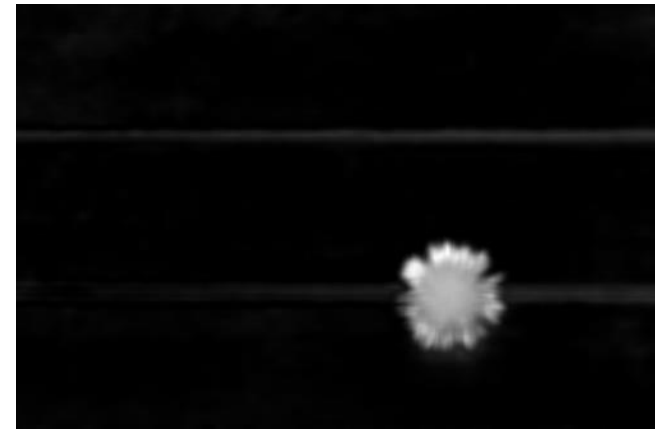


Compute the saliency map

```
clear all;  
close all;  
clc;
```

```
img = imread('flower.jpg');  
figure, imshow(img);
```

```
sm = saliency(img);  
figure, imshow(sm,[]);
```



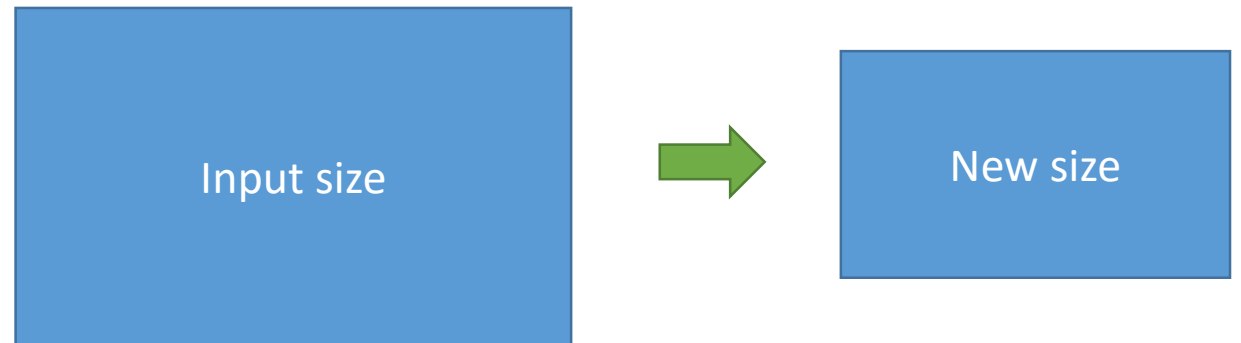
Set the new size

```
clear all;  
close all;  
clc;
```

```
img = imread('flower.jpg');  
figure, imshow(img);
```

```
sm = saliency(img);  
figure, imshow(sm,[]);
```

```
[height, width] = size(sm);  
new_height = height*2/3;  
new_width = width*2/3;
```



Compute the saliency sum in rows and columns

```
clear all;
```

```
close all;
```

```
clc;
```

```
img = imread('flower.jpg');
```

```
figure, imshow(img);
```

```
sm = saliency(img);
```

```
figure, imshow(sm,[]);
```

```
[height, width] = size(sm);
```

```
new_height = height*2/3;
```

```
new_width = width*2/3;
```

```
height_values = sum(sm');
```

```
width_values = sum(sm);
```


Get the candidate rows and columns to be removed

```
clear all;  
close all;  
clc;
```

```
img = imread('flower.jpg');  
figure, imshow(img);
```

```
sm = saliency(img);  
figure, imshow(sm,[]);
```

```
[height, width] = size(sm);  
new_height = height*2/3;  
new_width = width*2/3;
```

```
height_values = sum(sm');  
width_values = sum(sm);
```

```
[~, ind1] = sort(height_values);  
[~, ind2] = sort(width_values);
```

Remove candidate rows

```
img = imread('flower.jpg');  
figure, imshow(img);
```

```
sm = saliency(img);  
figure, imshow(sm,[]);
```

```
[height, width] = size(sm);  
new_height = height*2/3;  
new_width = width*2/3;
```

```
height_values = sum(sm');  
width_values = sum(sm);
```

```
[~, ind1] = sort(height_values);  
[~, ind2] = sort(width_values);
```

```
img(ind1(1:height - new_height),:,:) = [];  
figure, imshow(img);
```



Remove the candidate columns

...

```
img(ind1(1:height - new_height),:,:) = [];
```

```
figure,imshow(img);
```

```
img(:,ind2(1:width-new_width),:) = [];
```

```
figure,imshow(img);
```



Runtime measurement

```
clear all;
```

```
close all;
```

```
clc;
```

```
tic;
```

```
...
```

```
img(ind1(1:height - new_height),:,:) = [];
```

```
figure,imshow(img);
```

```
img(:,ind2(1:width-new_width),:) = [];
```

```
figure,imshow(img);
```

```
toc;
```

Try with a different image

- `img = imread('middle.jpg');`



Change the new size

```
[height, width] = size(sm);
```

```
new_height = height*2/3;
```

```
new_width = width;%width*2/3;
```



Q&A