
```
function templateMatchingModifiedImg()

    clc;
    clear all;
    close all;
    %load the image
    imgOrg = imresize(imread('vegan-modified.jpg'),0.5);
    template = imresize(imread('soy-dessert.jpg'), 0.5);

    figure;
    imhist(template);
    title('Histogram template');

    figure;
    imhist(imgOrg);
    title('histogram image');

    template = double(template);
    windowSize = size(template);
    img = imgOrg;
    img = padarray(imgOrg, floor(windowSize/2), 'replicate');
    dim = size(imgOrg);

    loc = [];
    %intialize the min value to a large value
    resMin = 10^9;

    %initialize the sum of difference matrix
    result = ones(size(imgOrg))*255;

    for i = 1:dim(1)
        for j = 1:dim(2)

            %find the midpoint of the window0
            mid = double(img(i+ floor(windowSize(1)/2),j+floor(windowSize(2)/2)));

            %define the patch of image
            I = double(img(i:i + windowSize(1) - 1 , j: j + windowSize(2) - 1));

            %subtract the image patch and template
            temp = (I - template);

            %sum of absoulte difference
            result(i,j) = sum(abs(temp(:)));

            %find the min intensity value in the sum of absolute difference
            if result(i,j) < resMin
                resMin = result(i,j);
                loc = [i j];
            end
        end
    end
end
```

```

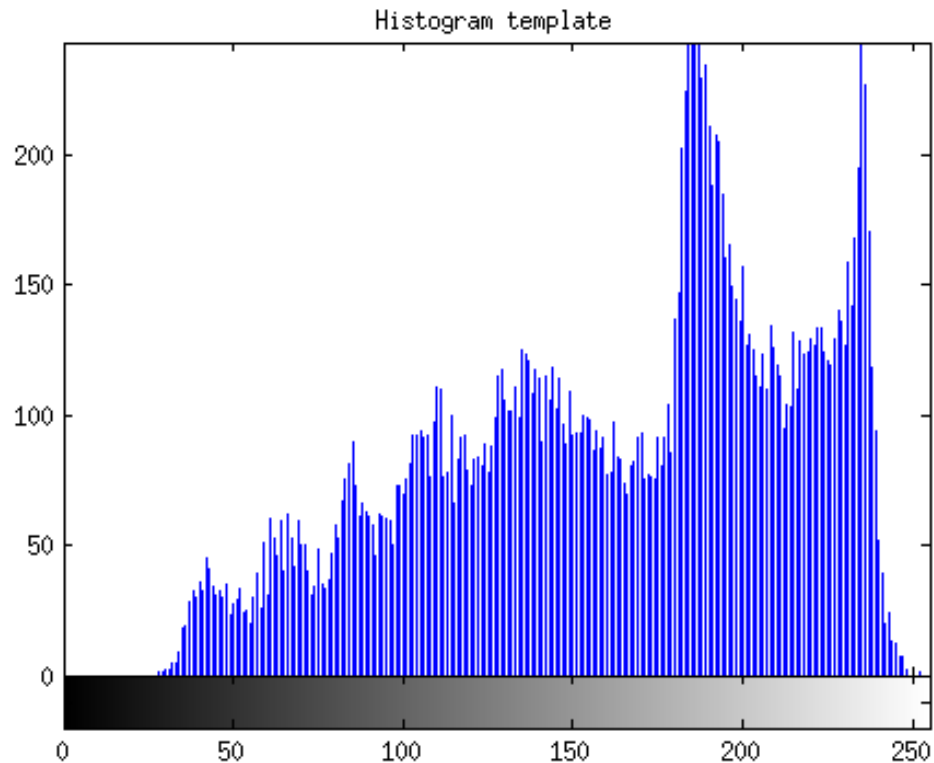
end

disp(['The location of min intensity is at location ' num2str(loc(1)) ', ' num2str(loc(2)) '
figure;
drawnow;
hold on;
figure;
imshow(imgOrg);
rectangle('Position', [loc(2) - windowSize(2)/2, loc(1) - windowSize(1)/2, loc(1) + windowSize(1)/2, loc(2) + windowSize(2)/2]);
title(['Image with Bounding Box around the patch with the min sum of absolute difference']);

figure;
imshow(mat2gray(result));
rectangle('Position', [loc(2) - windowSize(2)/2, loc(1) - windowSize(1)/2, loc(1) + windowSize(1)/2, loc(2) + windowSize(2)/2]);
title(['Sum of absolute difference Image with bounding box at ' num2str(loc(1)) ' and ' num2str(loc(2)) '']);
end

```

The location of min intensity is at location 382, 1



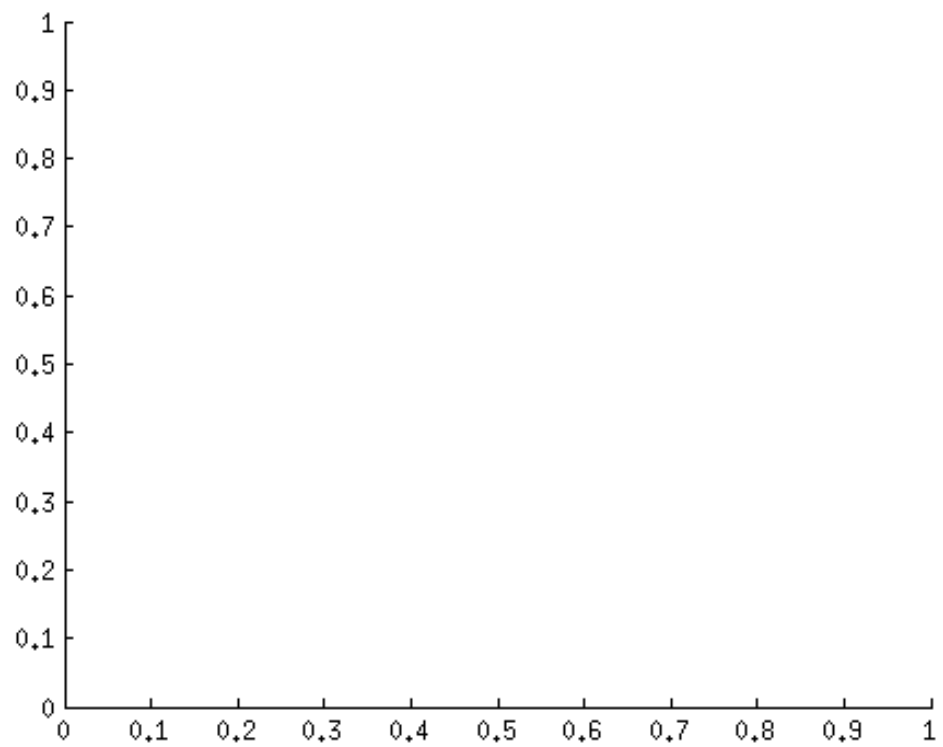
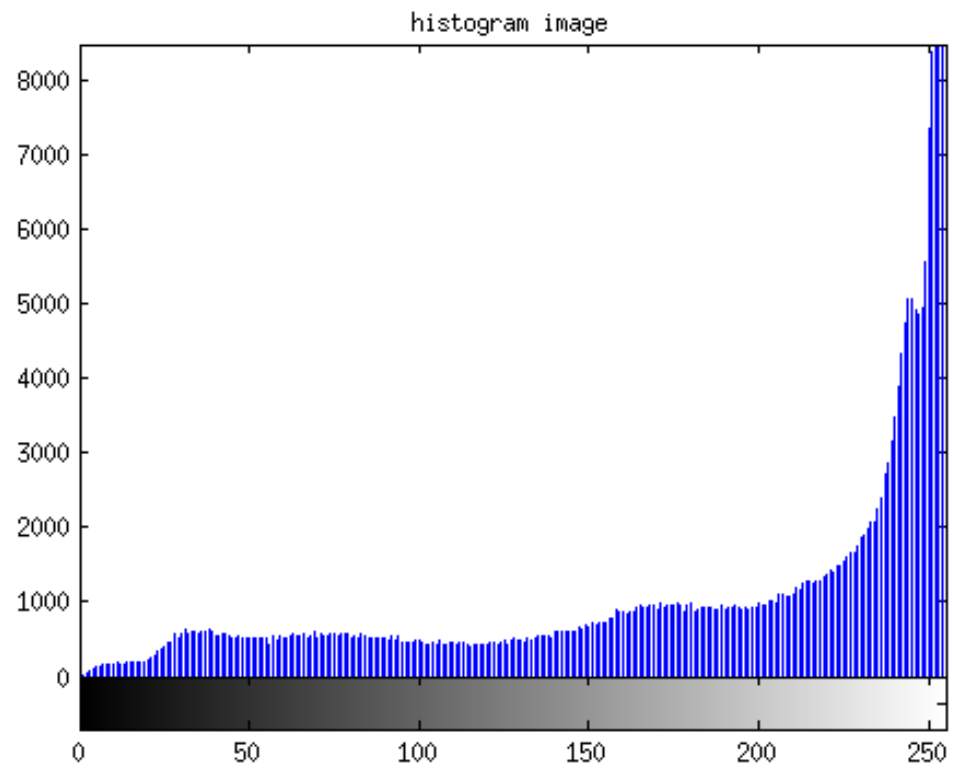


Image with Bounding Box around the patch with the min sum of absolute difference loc 382, 1



Sum of absolute difference Image with bounding box at 382, 1



The procedure does not work as most of the image pixel intensities are very high in the image as compared to the template as seen from the histogram of the images. The intensities are not normalized in either of the images and thus the sum of absolute difference fails to return the min value at the correct point. Instead the best position returned is an arbitrary value.

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