

## DIP ASSIGNMENT

**NAME:** Shoaib Akbar

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**CLASS:** BSCS 6<sup>th</sup>

**SUBJECT:** Digital Image Processing

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**CODE:**

```
Editor - Untitled2*
Untitled2* x +
1  onion = imread("onion.png");
2  peppers = imread("peppers.png");
3
4  imshow(onion)|
5  imshow(peppers)
6  % non-interactively
7  rect_onion = [111 33 65 58];
8  rect_peppers = [163 47 143 151];
9  sub_onion = imcrop(onion,rect_onion);
10 sub_peppers = imcrop(peppers,rect_peppers);
11 % OR
12 % interactively
13 %[sub_onion,rect_onion] = imcrop(onion); % choose the pepper below the onion
14 %[sub_peppers,rect_peppers] = imcrop(peppers); % choose the whole onion
15 % display sub images
16 imshow(sub_onion)
17 imshow(sub_peppers)
18 c = normxcorr2(sub_onion(:,:,1),sub_peppers(:,:,1));
19 figure
20 surf(c)
21 shading flat
22 % offset found by correlation
23 [max_c,imax] = max(abs(c(:)));
24 [ypeak,xpeak] = ind2sub(size(c),imax(1));
25 corr_offset = [(xpeak-size(sub_onion,2))
26               (ypeak-size(sub_onion,1))];
```

```
21 shading flat
22 % offset found by correlation
23 [max_c,imax] = max(abs(c(:)));
24 [ypeak,xpeak] = ind2sub(size(c),imax(1));
25 corr_offset = [(xpeak-size(sub_onion,2))
26               (ypeak-size(sub_onion,1))];
27 % relative offset of position of subimages
28 rect_offset = [(rect_peppers(1)-rect_onion(1))
29               (rect_peppers(2)-rect_onion(2))];
30 % total offset
31 offset = corr_offset + rect_offset;
32 xoffset = offset(1);
33 yoffset = offset(2);
34 xbegin = round(xoffset + 1);
35 xend = round(xoffset + size(onion,2));
36 ybegin = round(yoffset + 1);
37 yend = round(yoffset + size(onion,1));
38 % extract region from peppers and compare to onion
39 extracted_onion = peppers(ybegin:yend,xbegin:xend,:);
40 if isequal(onion,extracted_onion)
41     disp("onion.png was extracted from peppers.png")
42 end
43 recovered_onion = uint8(zeros(size(peppers)));
44 recovered_onion(ybegin:yend,xbegin:xend,:) = onion;
45 imshow(recovered_onion)
46 imshowpair(peppers(:,:,1),recovered_onion,"blend")
```

**OUTPUT:**

