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Score: / 5

CSE 5524

Computer Vision for HCI

SP'22

Homework Assignment #10

Due: Thursday 4/6

```
% Problem 1
iml = im2double(imread('left.png'));
imr = im2double(imread('right.png'));

% template = im2double(imread('template.png'));
% search = im2double(imread('search.png'));

[r,c,l] = size(iml);
scores = zeros(r,c,l);

template = imr(1:11,1:11);

% mean and standard deviation for each channel
meanTemp = mean(template(:,:,1),'all');
stdTemp = std(template(:,:,1),0,'all');

% compute NCC score
for r = 11:245
    for c = 11:245

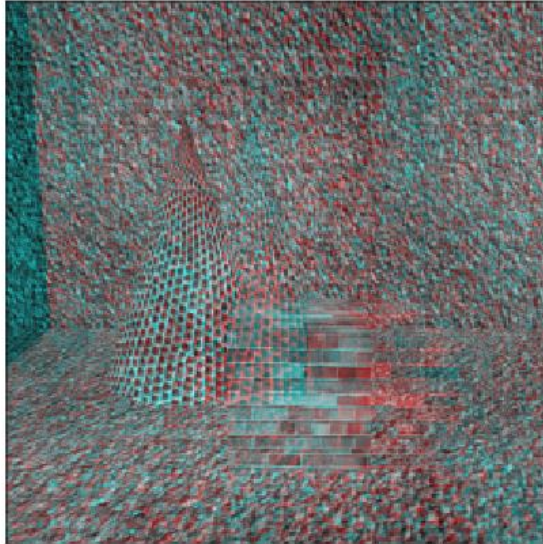
        P = iml(r-10:r+10,c-10:c+10,:);
        T = template;
        meanP = mean(P(:,:,1),'all');
        stdP = std(P(:,:,1),0,'all');
        val = 0;
        for x = 1:11
            for y = 1:11
                val = val + ((P(x,y,1)-meanP)*(T(x,y,1)-
meanTemp)/(stdP*stdTemp));
            end
        end
        val = val/(11*11-1);
        scores(r,c,1) = val;

    end
end

% best match found
scores = mean(scores,3);
k1 = max(max(scores));
[a,b] = find(scores == k1);
imagesc(search(a-10:a+10,b-10:b+10,:));

% plot the NCC scores
ls = reshape(scores,1,[]);
ls = sort(ls,'descend');
plot(ls,'-r');
xlabel('k');
ylabel('NCC');
```

Red-Cyan composite view of the rectified stereo pair image



< This is a composited view of the two images overlaying each other.

Using the NCC method we can generate a disparity map (seen below). It's interesting that it's able to pick up the distances well, but has difficulty with the edges of the objects.

Disparity Map

