

(c). Improving accuracy

```
grid_coordinates = []
p_correct = []
arr = []

for i = 0:width
    for j = 0:height
        grid_coordinates = [grid_coordinates; i*30, j*30, 1];
    end
end

for i = 1:80
    arr(i) = 1
end
```

```
arr = 1
arr = 1×2
    1    1
arr = 1×3
    1    1    1
arr = 1×4
    1    1    1    1
arr = 1×5
    1    1    1    1    1
arr = 1×6
    1    1    1    1    1    1
arr = 1×7
    1    1    1    1    1    1    1
arr = 1×8
    1    1    1    1    1    1    1    1
arr = 1×9
    1    1    1    1    1    1    1    1    1
arr = 1×10
    1    1    1    1    1    1    1    1    1    1
arr = 1×11
    1    1    1    1    1    1    1    1    1    1    1
arr = 1×12
    1    1    1    1    1    1    1    1    1    1    1    1
arr = 1×13
    1    1    1    1    1    1    1    1    1    1    1    1    1
arr = 1×14
    1    1    1    1    1    1    1    1    1    1    1    1    1    1    ...
arr = 1×15
    1    1    1    1    1    1    1    1    1    1    1    1    1    1    1    ...
arr = 1×16
    1    1    1    1    1    1    1    1    1    1    1    1    1    1    1    ...
arr = 1×17
    1    1    1    1    1    1    1    1    1    1    1    1    1    1    1    ...
arr = 1×18
    1    1    1    1    1    1    1    1    1    1    1    1    1    1    1    ...
arr = 1×19
    1    1    1    1    1    1    1    1    1    1    1    1    1    1    1    ...
arr = 1×20
    1    1    1    1    1    1    1    1    1    1    1    1    1    1    1    ...
arr = 1×21
    1    1    1    1    1    1    1    1    1    1    1    1    1    1    1    ...
arr = 1×22
    1    1    1    1    1    1    1    1    1    1    1    1    1    1    1    ...
```

```

arr = 1×23
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 ...
arr = 1×24
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 ...
arr = 1×25
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 ...
arr = 1×26
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 ...
arr = 1×27
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 ...
arr = 1×28
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 ...
arr = 1×29
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 ...
arr = 1×30
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 ...
arr = 1×31
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 ...
arr = 1×32
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 ...
arr = 1×33
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 ...
arr = 1×34
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 ...
arr = 1×35
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 ...
arr = 1×36
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 ...
arr = 1×37
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 ...
arr = 1×38
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 ...
arr = 1×39
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 ...
arr = 1×40
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 ...
arr = 1×41
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 ...
arr = 1×42
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 ...
arr = 1×43
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 ...
arr = 1×44
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 ...
arr = 1×45
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 ...
arr = 1×46
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 ...
arr = 1×47
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 ...
arr = 1×48
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 ...
arr = 1×49
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 ...
arr = 1×50
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 ...
arr = 1×51
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 ...
arr = 1×52
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 ...
arr = 1×53
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 ...
arr = 1×54
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 ...

```

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1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 ...
arr = 1x55
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 ...
arr = 1x56
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 ...
arr = 1x57
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 ...
arr = 1x58
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 ...
arr = 1x59
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 ...
arr = 1x60
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 ...
arr = 1x61
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 ...
arr = 1x62
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 ...
arr = 1x63
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 ...
arr = 1x64
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 ...
arr = 1x65
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 ...
arr = 1x66
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 ...
arr = 1x67
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 ...
arr = 1x68
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 ...
arr = 1x69
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 ...
arr = 1x70
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 ...
arr = 1x71
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 ...
arr = 1x72
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 ...
arr = 1x73
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 ...
arr = 1x74
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 ...
arr = 1x75
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 ...
arr = 1x76
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 ...
arr = 1x77
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 ...
arr = 1x78
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 ...
arr = 1x79
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 ...
arr = 1x80
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 ...

```

```

for i = 1:4

    H = eval(['H' num2str(i)]);
    p_approx = H*grid_coordinates';
    for j = 1:length(p_approx)
        p_approx(:,j) = p_approx(:,j) / p_approx(3,j);
    end

```

```

img = eval(['img' num2str(i)]);
figure(), imshow(img)
hold on
title(['Figure 1 : Projected grid corners for >> ' files(i)])
plot(p_approx(1,:),p_approx(2,:),'ro', 'MarkerSize',3);
hold off

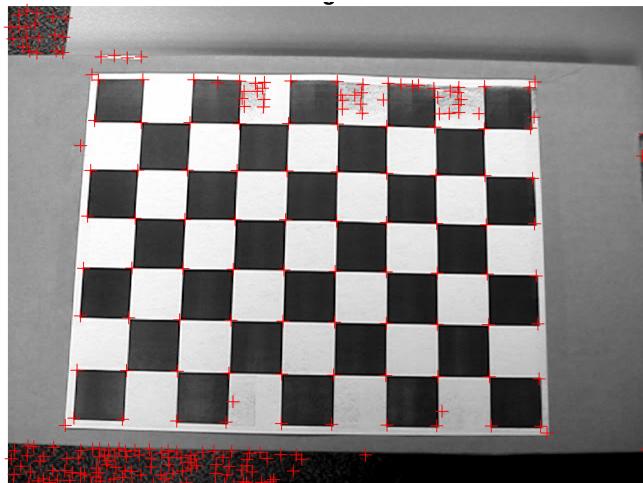
sigma = 2;
thresh = 500;
radius = 2;
[cim,r,c,rsubp,csubp]=harris(rgb2gray(img),sigma,thresh,radius,1);
title(["Figure 2 : Harris corners for >> " files(1)])

D = dist2(p_approx(1:2,:)',[csubp, rsubp]);
[D_sorted, D_index] = sort(D, 2);
p_correct(:,:,i) = cat(2, csubp(D_index(:,1)), rsubp(D_index(:,1)), transpose(arr));
%p_correct(:,:,i) = [csubp(D_index(:,1)), rsubp(D_index(:,1)), transpose(arr)];
figure(), imshow(img), title(["Figure3 : Grid Points for >> " files(i)])
hold on
plot(p_correct(:,1,i),p_correct(:,2,i),'g+')
hold off

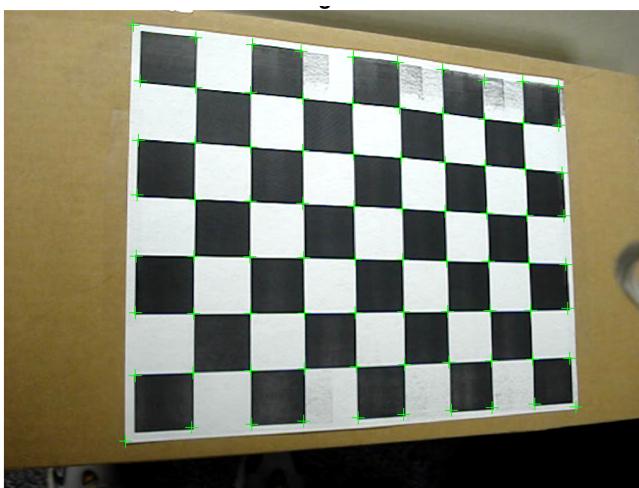
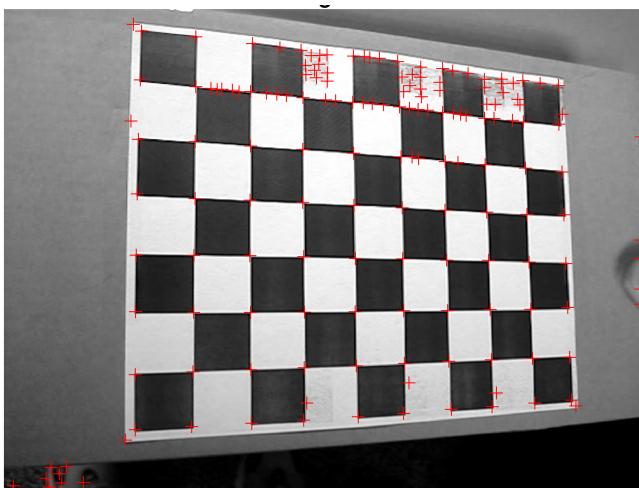
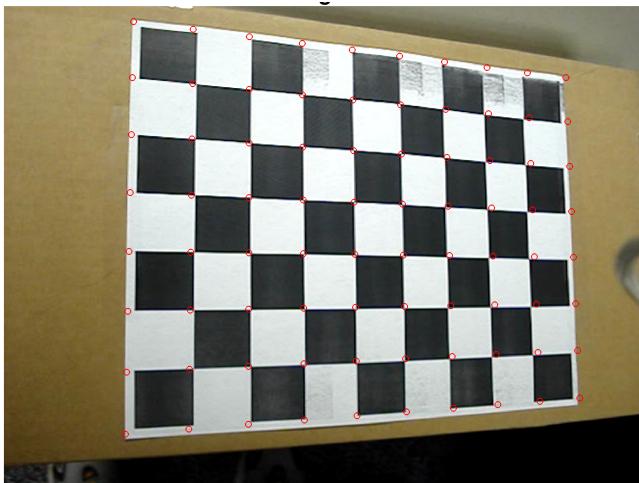
H_new(:,:,:,i) = homography2d(grid_coordinates',p_correct(:,:,:,i)');
H_new(:,:,:,i) = H_new(:,:,:,i)/H_new(3,3,i);
disp(["New Homography H for >> " files(i)])
disp(H_new(:,:,:,i))
end

```



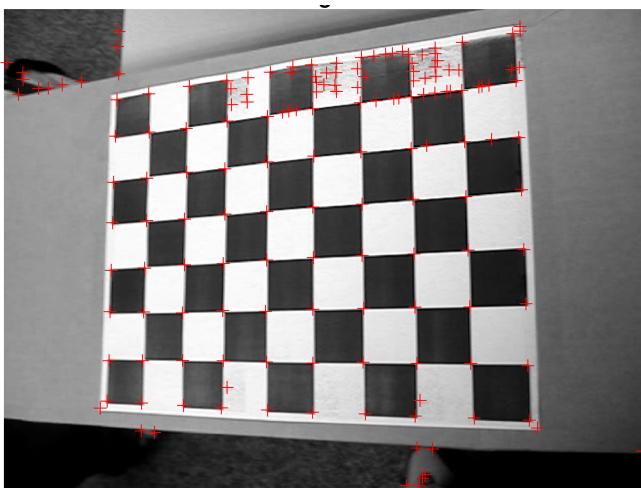
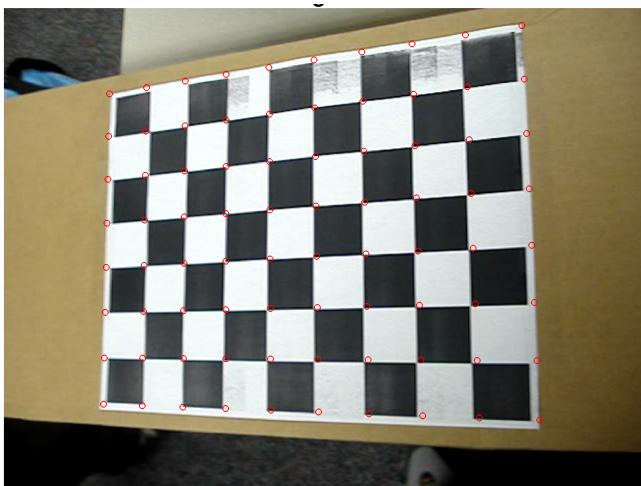


```
"New Homography H for >> "    "images2"  
1.7433    0.1589    62.8090  
0.0244   -1.6122   415.5829  
-0.0000    0.0004    1.0000
```



"New Homography H for >> " "images9"

2.2713	0.0789	126.9778
0.3139	-1.9443	426.3384
0.0011	0.0003	1.0000





```
"New Homography H for >> "images12"  
1.1300 0.0884 100.4824  
-0.2866 -1.4312 395.3177  
-0.0009 0.0003 1.0000
```





```
"New Homography H for >> "    "images20"  
1.7279    0.5775  121.5967  
-0.0127   -0.7906  278.3214  
0.0000    0.0018   1.0000
```

```
Hnew1 = H_new(:,:,1);  
Hnew2 = H_new(:,:,2);  
Hnew3 = H_new(:,:,3);  
Hnew4 = H_new(:,:,4);
```