Exercise-08

190639B

In [ ]:

```
import numpy as np
import cv2 as cv
import matplotlib.pyplot as plt
%matplotlib inline
f=open(r'D:\4th sem uom\machine vision\coding\ex08\templeSparseRing\templ
assert f is not None

n=int(f.readline())
l=f.readline().split()
im1_fn=l[0]

k1=np.array([float(i) for i in l[1:10]]).reshape((3,3))
R1=np.array([float(i) for i in l[10:19]]).reshape((3,3))
t1=np.array([float(i) for i in l[19:22]]).reshape((3,1))

#reading the informaion on the second image
l=f.readline().split()
im2_fn=l[0]

k2=np.array([float(i) for i in l[1:10]]).reshape((3,3))
R2=np.array([float(i) for i in l[10:19]]).reshape((3,3))
t2=np.array([float(i) for i in l[19:22]]).reshape((3,1))

#read the two images and show
im1=cv.imread(r'D:\4th sem uom\machine vision\coding\ex08\templeSparseRing
im2=cv.imread(r'D:\4th sem uom\machine vision\coding\ex08\templeSparseRing
assert im1 is not None
assert im2 is not None

cv.namedWindow('Im')
cv.imshow('Im',im1)
cv.waitKey(0)
cv.imshow('Im',im2)
cv.waitKey(0)
cv.destroyAllWindows()

plt.imshow(cv.cvtColor(im1, cv.COLOR_BGR2RGB))
plt.xticks([]),plt.yticks([])
plt.title('image1')
plt.show()
plt.imshow(cv.cvtColor(im2, cv.COLOR_BGR2RGB))
plt.title('image2')
plt.xticks([]),plt.yticks([])
plt.show()
#compute p1 and p2
p1=k1@np.hstack((R1,t1))
p2=k2@np.hstack((R2,t2))
```

image1

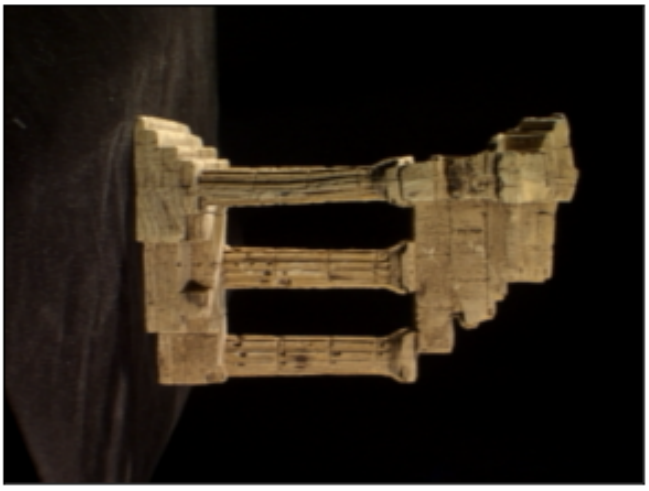
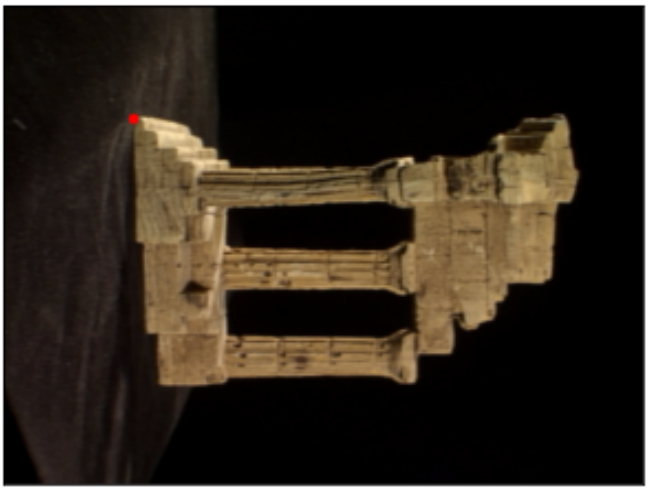


image2

In [ ]:
```
from scipy.linalg import null_space
def skew(x):
    x=x.ravel()
    return np.array([[0,-x[2],x[1]],[x[2],0,-x[0]],[-x[1],x[0],0]])

c=null_space(p1)
c=c*np.sign(c[0,0])
e2=p2@c
e2x=skew(e2)

F=e2x@p2@np.linalg.pinv(p1)
F
```

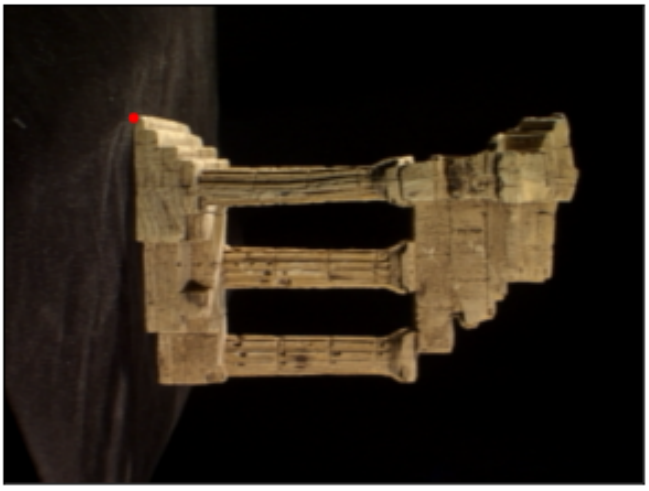
Out[ ]:
```
array([[-2.87071497e-04, -3.96261289e-02,  2.94221686e+02],
       [-3.55039713e-02,  1.65329260e-04,  1.78860854e+01],
       [-2.76702814e+02,  2.12942175e+01, -9.06669374e+03]])
```

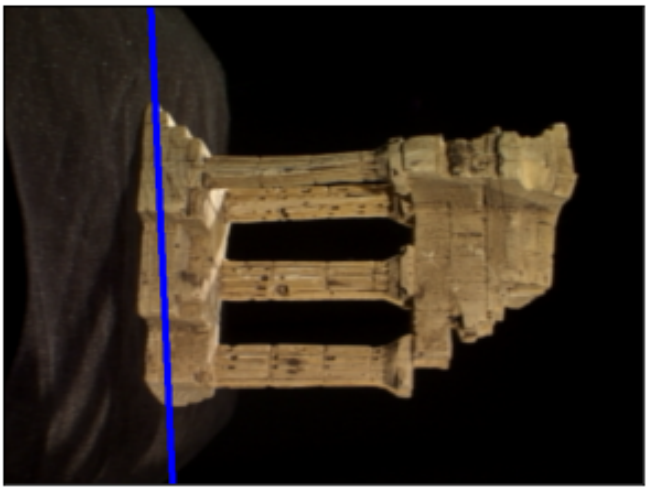
In [ ]:
```
x=np.array([130,115,1])
cv.circle(im1,(x[0],x[1]),5,(0,0,255),-1)
cv.imshow('Im',im1)
cv.waitKey(0)
cv.destroyAllWindows()

plt.imshow(cv.cvtColor(im1, cv.COLOR_BGR2RGB))
plt.yticks([]),plt.xticks([])
plt.show()
```



In [ ]:

```
l2=F @ x.T
p1=np.array([0,(l2[0]*0+l2[2])/l2[1]]).astype(int)
p2=np.array([500,(l2[0]*500+l2[2])/l2[1]]).astype(int)
cv.line(im2,(p1[0],p1[1]),(p2[0],p2[1]),(255,0,0),5)
cv.namedWindow('Im')
cv.imshow('Im',im1)
cv.waitKey(0)
cv.imshow('Im',im2)
cv.waitKey(0)
cv.destroyAllWindows()

plt.imshow(cv.cvtColor(im1, cv.COLOR_BGR2RGB))
plt.yticks([]),plt.xticks([])
plt.show()
plt.imshow(cv.cvtColor(im2, cv.COLOR_BGR2RGB))
plt.yticks([]),plt.xticks([])
plt.show()
```





In [ ]:
```
while True:
    l=f.readline().split()
    if l==[]:
        break
    im2_fn=l[0]
    im2=cv.imread(r'D:\4th sem uom\machine vision\coding\ex08\templeSpars
    cv.line(im2,(p1[0],p1[1]),(p2[0],p2[1]),(255,0,0),5)
    cv.namedWindow('Im')
    cv.imshow('Im',im1)
    cv.waitKey(0)
    cv.imshow('Im',im2)
    cv.waitKey(0)
    cv.destroyAllWindows()
```

In [ ]:
```

```