import numpy as np

import matplotlib.pyplot as plt

import cv2, matplotlib

from matplotlib.patches import Ellipse

from pylab import ginput, show, axis

# READ RGB IMAGE IN OPEN CV

img\_cv = cv2.imread('images/Picture1.png')

# CONVERT TO GRAYSCALE IMAGE

gray\_img\_cv = cv2.cvtColor(img\_cv, cv2.COLOR\_BGR2GRAY)

gray\_img\_plt = cv2.cvtColor(gray\_img\_cv, cv2.COLOR\_GRAY2RGB)

plt.figure(), plt.imshow(gray\_img\_plt)

# threshold for grayscale image

th = int(np.mean(gray\_img\_plt))

\_, th\_img\_cv = cv2.threshold(gray\_img\_cv, th, 255, cv2.THRESH\_BINARY)

th\_img\_plt = cv2.cvtColor(th\_img\_cv, cv2.COLOR\_GRAY2RGB)

plt.figure(8), plt.imshow(th\_img\_plt)

#cv2.imshow('image',th\_img\_plt)

"""human click on the drop let"""

clicks=2

print("Please click two(2) times")

fig\_inp = ginput(clicks) # it will wait for two clicks

for iclick in range(clicks):

plt.plot(fig\_inp[iclick][0],fig\_inp[iclick][1],'bo')

xdata = np.array([p[0] for p in fig\_inp])

ydata = np.array([p[1] for p in fig\_inp])

yleft=np.array(ydata[0])

yright=np.array(ydata[1])

xleft=np.array(xdata[0])

xright=np.array(xdata[1])

"""calculating the contact angle"""

m=(yleft-yright)/(xleft-xright)

rot\_angle=int(np.arctan(m)\*180/np.pi)

if rot\_angle<0 :

rot\_angle+=180

print("the contact angle is",180-rot\_angle)