# LABORATORIUM 9

# Podstawy pracy z OpenCV

# ZADANIE

1. Wczytać obraz i przygotować go do dalszego przetwarzania

   użyć cv2.imread(filename[, flags] )

2. Zapisać obraz przez bibliotekę OpenCV za pomocą metody imwrite().
3. Wyciąć kawałek obrazu

```
# extract a 100x100 pixel square ROI (Region of Interest) from the
# input image starting at x=320,y=60 at ending at x=420,y=160
roi = image[60:160, 320:420]
cv2.imshow("ROI", roi)
cv2.waitKey(0)
```

4. Zmienić rozmiar obrazu

```
# resize the image to 200x200px, ignoring aspect ratio
resized = cv2.resize(image, (200, 200))
cv2.imshow("Fixed Resizing", resized)
cv2.waitKey(0)
```

5. Obrócić obraz o $45^0$ za pomocą macierzy

```
img=cv2.imread('gt.jpg')
h,w=img.shape[0:2]
center = (w // 2, h // 2)
M = cv2.getRotationMatrix2D(center, -45, 1.0)
rotated = cv2.warpAffine(img, M, (w, h))
cv2.imshow("OpenCV Rotation", rotated)
```

Lub

```
rotated = imutils.rotate(image, -45)
cv2.imshow("Imutils Rotation", rotated)
cv2.waitKey(0)
```

6. Rozmyć obraz

7. Skleić obrazy

```
resized=imutils.resize(img, width=460)
bresized=imutils.resize(blurred, width=460)
suming=np.hstack((resized,bresized))
```

8. Rysowanie

https://docs.opencv.org/2.4/modules/core/doc/drawing_functions.html

**Prostokąt**

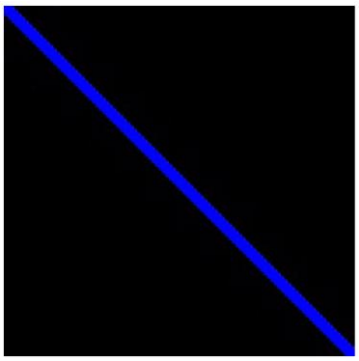
```
cv2.rectangle(img, pt1, pt2, color [, thickness, lineType, shift])
```

```
import cv2
import numpy as np
import imutils
img=cv2.imread('gt.jpg')
output = img.copy()
cv2.rectangle(output , (270, 50), (420, 260), (0, 0, 255), 2)
cv2.imshow("Rectangle", output)
```

**Rysowanie linii**

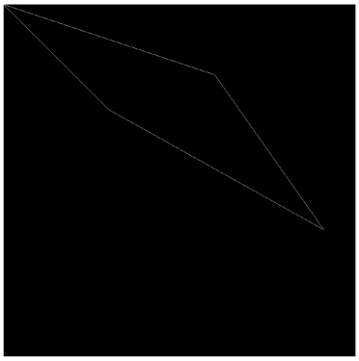
```
img=cv2.line(img,pt1,pt2,color[,thickness[,lineType[,shift]]])
```

```
 import numpy as np
 import cv2
 # Create a black image
 img = np.zeros((200,200,3), np.uint8)
# Draw a diagonal blue line with thickness of 5 px
 cv2.line(img,(0,0),(200,200),(255,0,0),5)
```



Rysowanie linii łamanych przez kilka punktów

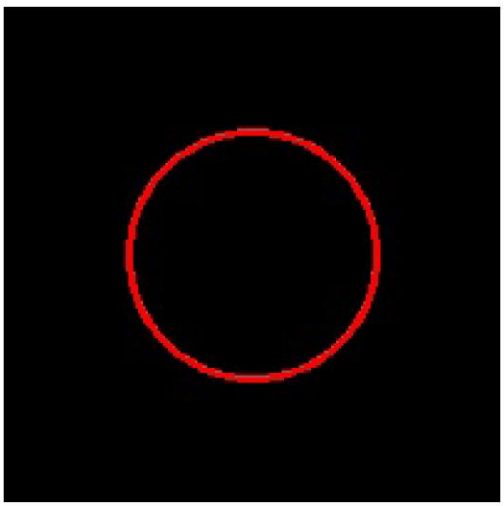
```
img = np.zeros((1000,1000,3), np.uint8)
points = np.array([[600,200],[910, 641],[300,300],[0,0]])
cv2.polylines(img, np.int32([points]), 1, (255,255,255))
cv2.imshow('1',img)
```



**Rysowanie koła**

```
cv2.circle(img, center, radius, color[, thickness[, lineType[, shift]]])
```

```
img = np.zeros((200,200,3), np.uint8)
output = img.copy()
cv2.circle(output, (100,100), 50, (0, 0, 255), 2)
cv2.imshow("Circle", output)
```



9. Umieszczanie tekstu na obrazie

```
cv2.putText(img,text,org,fontFace,fontScale,color[,thickness[,lineType[,
                                                    bottomLeftOrigin]]])
```

```
iimg=cv2.imread('gt.jpg')
font = cv2.FONT_HERSHEY_SIMPLEX
font1=cv2.FONT_HERSHEY_COMPLEX
font2=cv2.FONT_HERSHEY_SCRIPT_COMPLEX
cv2.putText(img,'OpenCV',(10,500), font, 4,(255,255,255),2,cv2.LINE_4)
cv2.putText(img,'OpenCV',(10,300), font1, 4,(255,255,255),2,cv2.LINE_4)
cv2.putText(img,'OpenCV',(10,100), font2, 4,(255,255,255),4,cv2.LINE_4)
cv2.imshow("Text", img)
```


**Proszę napisać swoje Imię na obrazku**