

Basic

4.Eroding and Dilating (Ерозія і розширення)

код:

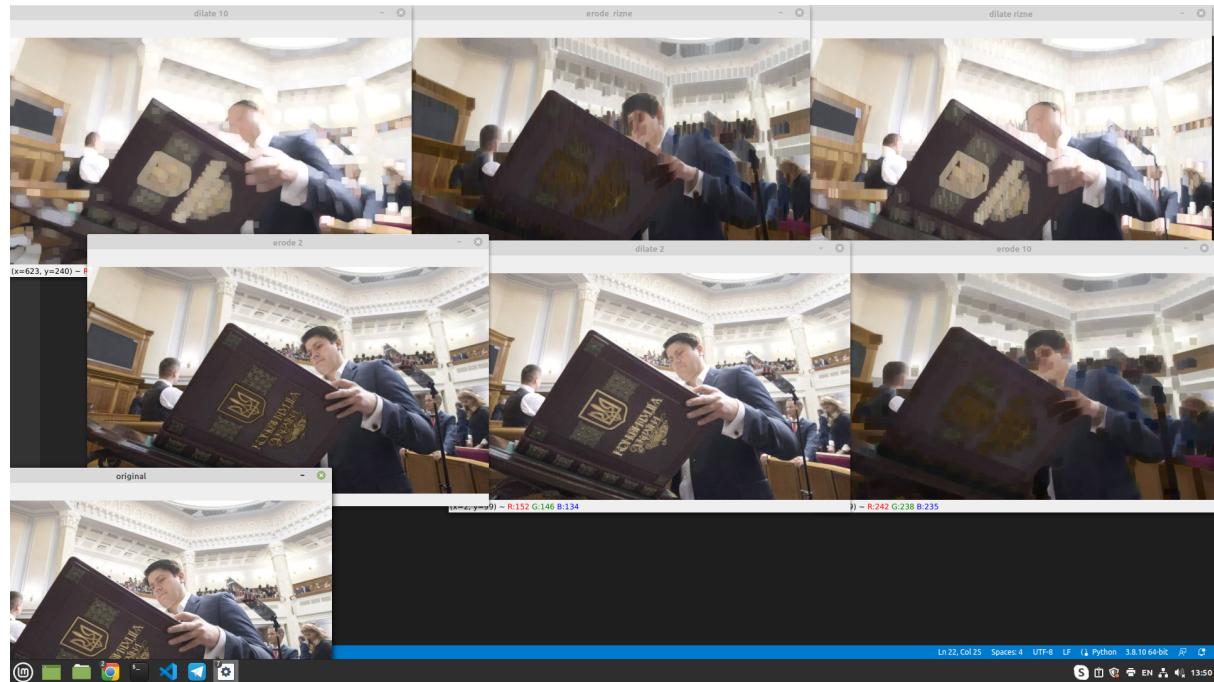
```
import cv2
import numpy as np
img= cv2.imread("/home/rodion/yuliia0/aboba/cv/basic/smoothing.jpg")
ker = np.ones((2, 2), np.uint8)
ero = cv2.erode(img, ker)
dil = cv2.dilate (img, ker)

ker = np.ones((10, 10), np.uint8)
ero2 = cv2.erode(img, ker)
dil2 = cv2.dilate (img, ker)

ker = np.ones((14, 3), np.uint8)
ero3 = cv2.erode(img, ker)
dil3 = cv2.dilate (img, ker)

cv2.imshow("original", img)
cv2.imshow("erode 2", ero)
cv2.imshow("dilate 2", dil)
cv2.imshow("erode 10", ero2)
cv2.imshow("dilate 10", dil2)
cv2.imshow("erode rizne", ero3)
cv2.imshow("dilate rizne", dil3)
cv2.waitKey(0)
```

Виконання:



5. More Morphology Transformations (Більше морфологічних перетворень)

Код:

```
import cv2
import numpy as np
img= cv2.imread("/home/rodion/yuliia0/aboba/cv/basic/cat.jpg")
ker = np.ones((5, 5), np.uint8)
open = cv2.dilate(cv2.erode(img, ker),ker)
close = cv2.erode(cv2.dilate(img, ker),ker)
morph=cv2.dilate (img, ker)-cv2.erode(img, ker)
top=img-open
bl=close-img

cv2.imshow("original", img)
cv2.imshow("open", open)
cv2.imshow("close", close)
cv2.imshow("morphological gradient", morph)
cv2.imshow("Top Hat", top)
cv2.imshow("Black Hat", bl)
cv2.waitKey(0)
```

Результат:
оригінал



open



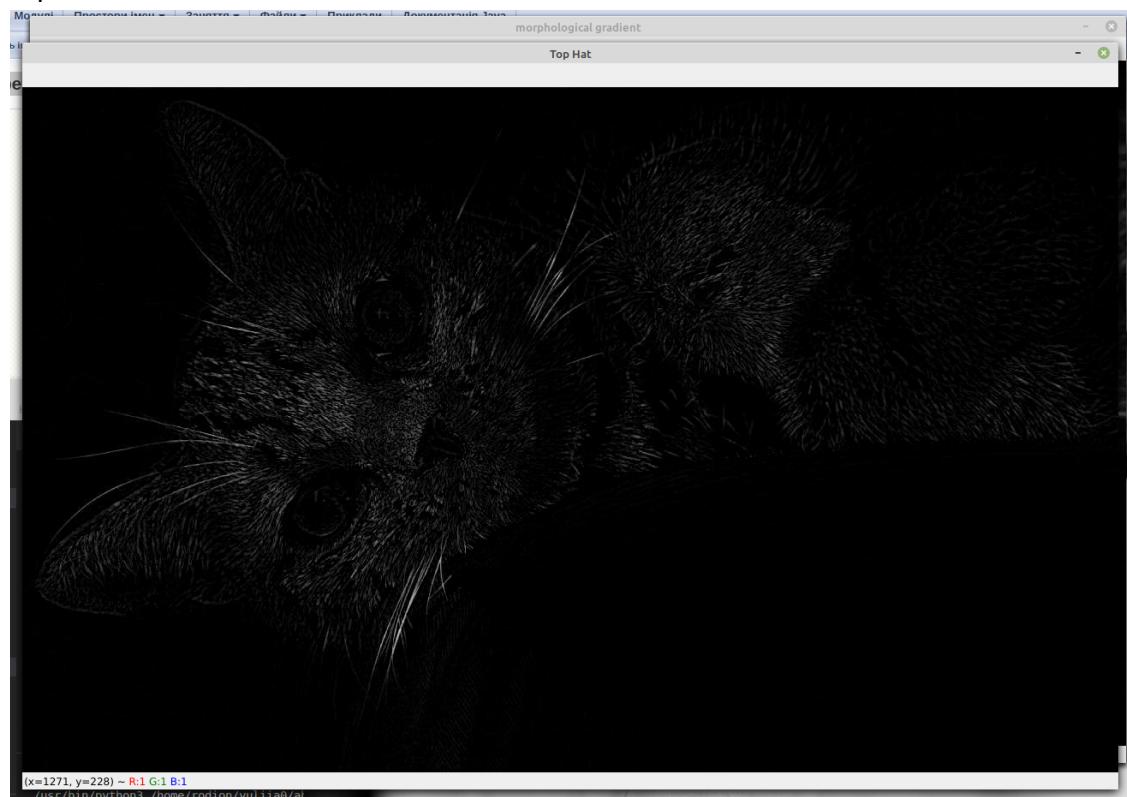
close



morphological gradient

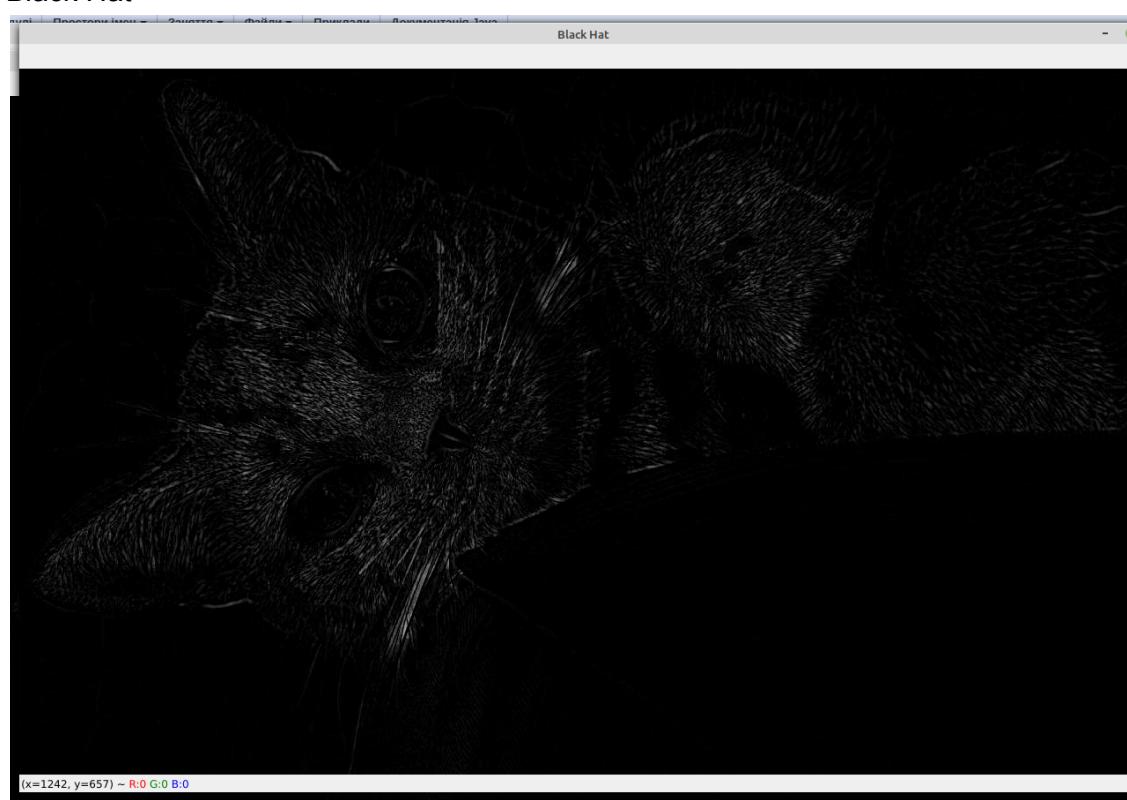


Top Hat



(x=1271, y=228) ~ R:1 G:1 B:1
/usr/bin/python3 /home/rodion/yutilia0/al

Black Hat



(x=1242, y=657) ~ R:0 G:0 B:0
(=1111, y=5) ~ R:0 G:0 B:0

6.Hit-or-Miss(Хіт-або-міс)

Код:

```
import cv2
import numpy as np

input = np.array([
[0, 0, 0, 0, 0, 0, 0, 0],
[0, 0, 255, 255, 255, 0, 0, 0],
[0, 255, 255, 255, 255, 255, 0, 0],
[0, 255, 255, 0, 255, 255, 255, 0],
[0, 255, 255, 255, 255, 255, 0, 0],
[0, 0, 255, 255, 255, 0, 0, 0],
[0, 255, 0, 0, 0, 255, 0, 0],
[0, 0, 255, 255, 255, 0, 0, 0]), dtype="uint8")

ker = np.array([
[1, 1, 0],
[0, -1, 0],
[0, 1, 1]], dtype="int")

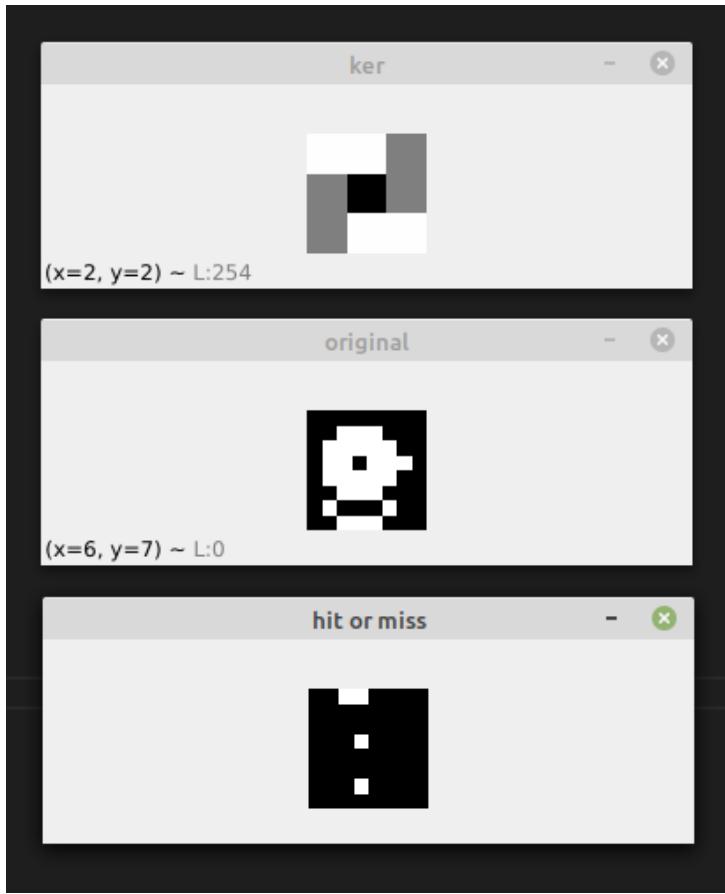
img = cv2.morphologyEx(input, cv2.MORPH_HITMISS, ker)

cv2.imshow("hit or miss", img)
cv2.imshow("original", input)

rate = 50
ker = (ker + 1) * 127
ker = np.uint8(ker)

cv2.imshow("ker", ker)
cv2.waitKey(0)
```

Результат:



7. Extract horizontal and vertical lines by using morphological operations (Виділіть горизонтальні та вертикальні лінії за допомогою морфологічних операцій)

Код:

```
import cv2
import numpy as np

img = cv2.imread ("/home/rodion/yuliia0/aboba/cv/basic/notyky.jpg")
cv2.imshow("orig", img)

img = cv2.cvtColor(img, cv2.COLOR_BGR2GRAY)
img = cv2.bitwise_not(img)
bw
= cv2.adaptiveThreshold(img, 255, cv2.ADAPTIVE_THRESH_MEAN_C, cv2.THRESH_BINARY, 15, -2)

hS = cv2.getStructuringElement(cv2.MORPH_RECT, (bw.shape[1] // 30, 1))
h = cv2.dilate(cv2.erode(bw, hS), hS)
```

```

vS = cv2.getStructuringElement(cv2.MORPH_RECT, (1, bw.shape[0] // 30))

v = cv2.dilate(cv2.erode(bw, vS), vS)
v = cv2.bitwise_not(v)
h = cv2.bitwise_not(h)

cv2.imshow("vertical", v)
cv2.imshow("horizontal", h)
cv2.waitKey(0)

```

Результат:

