gradients

January 31, 2024

[ ]:

```
import cv2 as cv
import numpy as np
```

Read the original image from the file ‘cat.jpg’

[ ]:

```
img = cv.imread('Images/cat.jpg')
cv.imshow('Cat', img)
```

Convert the original image to grayscale

[ ]:

```
gray = cv.cvtColor(img, cv.COLOR_BGR2GRAY)
cv.imshow('Gray', gray)
```

Laplacian

[ ]:

```
lap = cv.Laplacian(gray, cv.CV_64F)
lap = np.uint8(np.absolute(lap))
cv.imshow('Laplacian', lap)
```

Sobel

[ ]:

```
sobelx = cv.Sobel(gray, cv.CV_64F, 1, 0)  # Sobel operator for x-direction 1 =␣
 ↪x, 0 = y
sobely = cv.Sobel(gray, cv.CV_64F, 0, 1)  # Sobel operator for y-direction  0 =␣
 ↪x, 1 = y
combined_sobel = cv.bitwise_or(sobelx, sobely)  # Combine Sobel x and Sobel y
```

Display individual Sobel components and the combined result

[ ]:

```
cv.imshow('Sobel X', sobelx)
cv.imshow('Sobel Y', sobely)
cv.imshow('Combined Sobel', combined_sobel)
```

Canny edge detection

[ ]:

```
canny = cv.Canny(gray, 150, 175)
cv.imshow('Canny', canny)
```

[ ]:

```
cv.waitKey(0)
```