Day

Date

Daily Report

Today's training session was based on OpenCV

Today's Topic

Computer Vision

It is a field of computer science that focuses on enabling computers to identify and understand objects and people in images and videos.

1. OpenCV

OpenCV, short for Open Source Computer Vision Library, is an open-source computer vision and machine learning software library. Originally developed by Intel, it is now maintained by a community of developers under the OpenCV Foundation.

from google.colab.patches import cv2_imshow

2. methods

- cv2.imread(image) - used to read or upload the image
- cv2.imwrite(image,name) - used to save the image
- cv2_imshow(image) - used to show the output
- cv2.cvtColor(image,cv2.color) - used to change the color of image
- cv2.resize(image,(x,y)) - used to resize the image
- cv2.GaussianBlur(image,(x,y),standard deviation) - used to blur the image
- cv2.Canny(image,pixel) - used to detect the edges
- cv2.line(image,start_point,end_point,color,thickness) - used to draw the line
- cv2.rectangle(image,start,end,color,thickness) - used to draw the rectangle
- cv2.circle(image,center,radius,color,thickness) - used to draw the circle
- cv2.putText(image,text,org,font,font_scale,thickness) - used to write text
- color,color,...,color = cv2.split(image) - used to split the image
- np.zeros_like(color) - used to create a blank channel
- cv2.merge([color,color,....color]) - merge the color with blank channel
- cv2.cvtColor(image,cv2.COLOR_BGR2HSV) - used to convert into hsv
- cv2.threshold(image,thresh,maxvel,type) - used for threshing

1. Install OpenCV

```
pip install opencv-python
```

```
Requirement already satisfied: opencv-python in /usr/local/lib/python3.10/dist-packages
Requirement already satisfied: numpy>=1.21.2 in /usr/local/lib/python3.10/dist-packages
```

Display and Upload the Image

```
#import openCV
import cv2
from google.colab.patches import cv2_imshow

#Upload the image
image = cv2.imread('/content/istockphoto-2158303169-1024x1024.jpg')

#Print image
cv2_imshow(image)
```

Convert image into GrayScale

```
#upload the image
image = cv2.imread('/content/istockphoto-2158303169-1024x1024.jpg')

#convert into grayscale
gray_image = cv2.cvtColor(image,cv2.COLOR_BGR2GRAY)
cv2_imshow(gray_image)
```

Save the Image

```
#upload the image
image = cv2.imread('/content/istockphoto-2158303169-1024x1024.jpg')

#convert image into grayscale
gray_image = cv2.cvtColor(image,cv2.COLOR_BGR2GRAY)

#save an image
if image is None:
  print(f"unable to read the image")
else:
  #Print grayscale image
  cv2_imshow(gray_image)

  #save imge
  cv2.imwrite('gray_image.jpg',gray_image)#to save the image
```

Resize the image

```
#upload the image
image = cv2.imread('/content/istockphoto-2158303169-1024x1024.jpg')

#convert into grayscale
gray_image = cv2.cvtColor(image,cv2.COLOR_BGR2GRAY)

if image is None:
  print("unable to read the image!")
else:
  #resize real image
  resize = cv2.resize(image,(300,300))
  cv2_imshow(resize)

  #resize grayscale
  resize2 = cv2.resize(gray_image,(300,300))
  cv2_imshow(resize2)

  #save both images
  cv2.imwrite("resize_image.jpg",resize)
  cv2.imwrite("resize_gray_image.jpg",resize2)
```

Convert into Blur image

```
#upload the image
image = cv2.imread('/content/istockphoto-2158303169-1024x1024.jpg')

#convert into grayscale
gray_image = cv2.cvtColor(image,cv2.COLOR_BGR2GRAY)

if image is None:
  print("unable to read the image!")
else:
  #convert real image into blur image
  blur_image = cv2.GaussianBlur(image,(15,15),0)
  cv2_imshow(blur_image)

  #convert grayscale into blur image
  blur_image2 = cv2.GaussianBlur(gray_image,(15,15),0)
  cv2_imshow(blur_image2)
```

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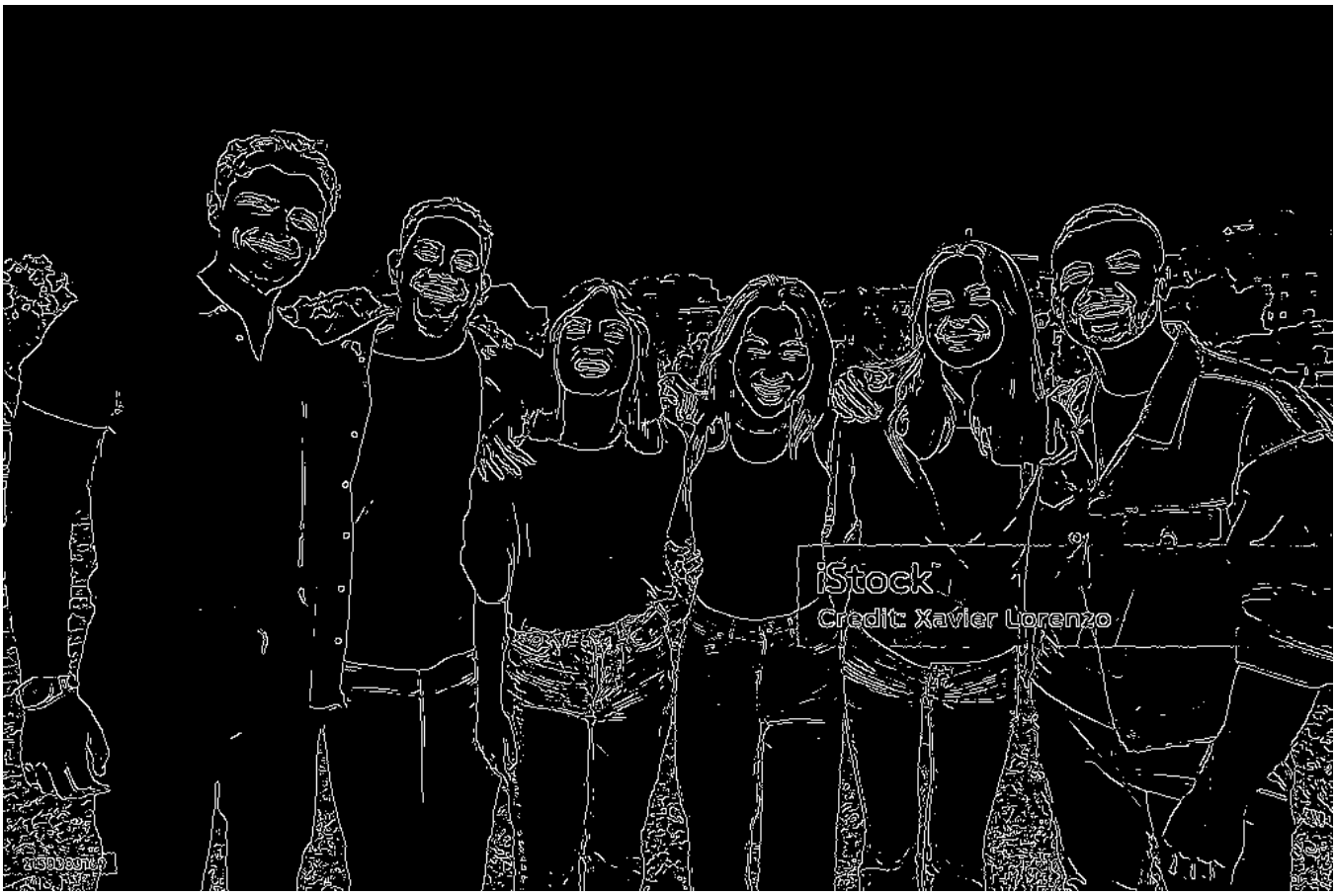
Edge Detection

```
#upload the image
image = cv2.imread('/content/istockphoto-2158303169-1024x1024.jpg')

#edge detection
edge = cv2.Canny(image,200,200)
cv2_imshow(edge)
```



Draw the line on image

```
#upload the image
image = cv2.imread('/content/istockphoto-2158303169-1024x1024.jpg')

#components for line
start = (500,500)
end = (100,100)
color = (0,255,0)
thickness = 7

#draw the line
cv2.line(image,start,end,color,thickness)
cv2_imshow(image)
```

Draw the Circle on image

```
#upload the image
image = cv2.imread('/content/istockphoto-2158303169-1024x1024.jpg')

#components for rectangle
start = (500,500)
end = (100,100)
```