

OpenCV

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Reference

<https://www.slideshare.net/WeiWenHsu/opencv-with-python>

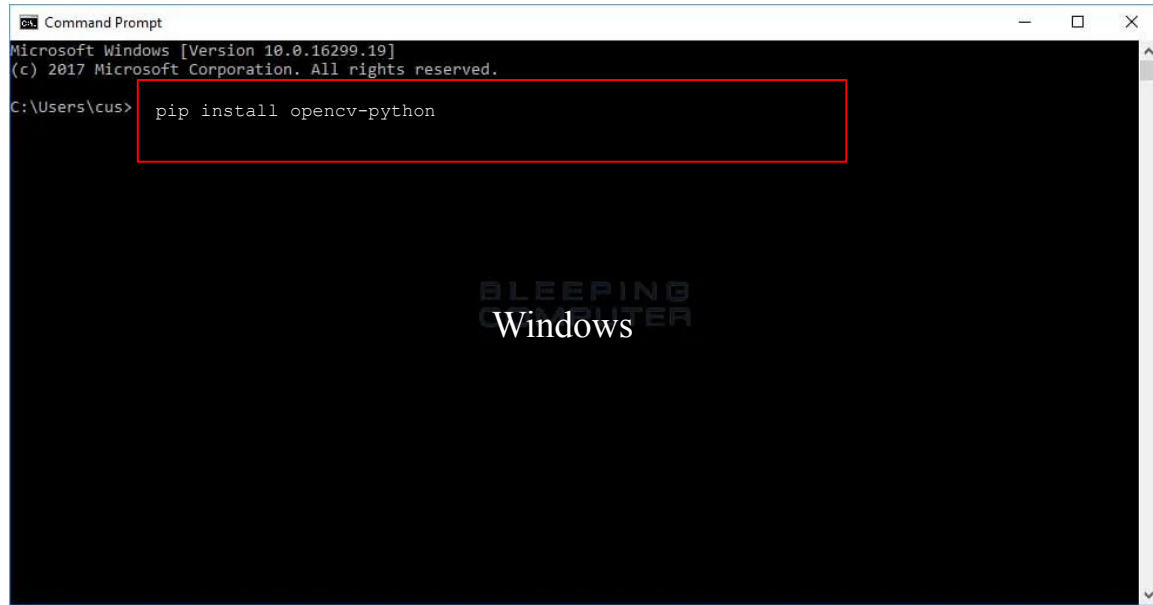
What is OpenCV

- OpenCV is a library of programming functions mainly aimed at real-time computer vision.
- It is developed by Intel.

Installation

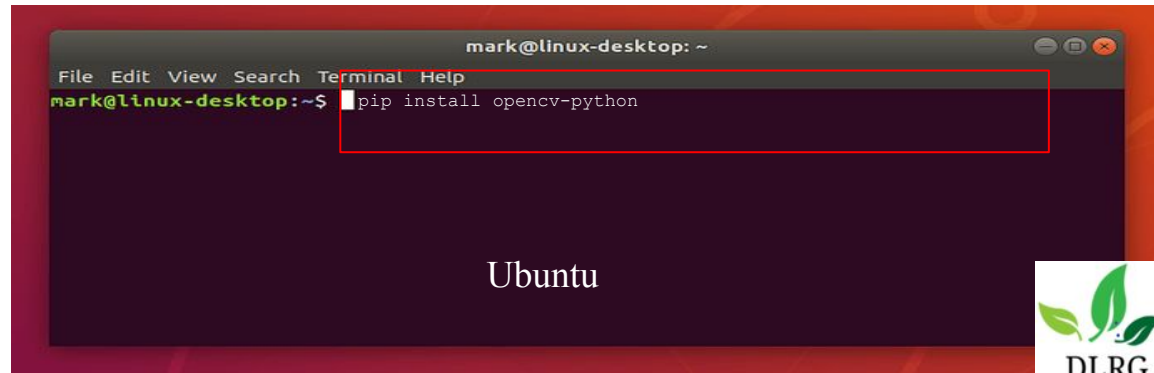
- Type command in cmd/Terminal

```
pip install opencv-python
```



A screenshot of a Windows Command Prompt window. The title bar reads 'Command Prompt'. The window content shows the following text: 'Microsoft Windows [Version 10.0.16299.19]', '(c) 2017 Microsoft Corporation. All rights reserved.', and 'C:\Users\cus>'. The command 'pip install opencv-python' is entered on the line following the prompt. A red rectangular box highlights the command text.

Windows



A screenshot of an Ubuntu Terminal window. The title bar reads 'mark@linux-desktop: ~'. The window content shows a menu bar with 'File', 'Edit', 'View', 'Search', 'Terminal', and 'Help'. Below the menu bar, the prompt 'mark@linux-desktop:~\$' is followed by the command 'pip install opencv-python'. A red rectangular box highlights the command text.

Ubuntu

OpenCV

- How to check OpenCV is installed or not.

```
>>> import cv2
```

```
>>> print(cv2.__version__)
```

Numpy

- NumPy is a Python C extension library for array-oriented computing
 - Efficient
 - In-memory
 - Contiguous (or Strided)
 - Homogeneous (but types can be algebraic)
- NumPy is suited to many applications
 - Image processing
 - Signal processing
 - Linear algebra
- NumPy aims to provide an array object that is up to 50x faster than traditional Python lists, it provides a lot of supporting functions that make working with ndarray very easy.

```
import numpy

arr = numpy.array([1, 2, 3, 4, 5])

print(arr)
```

Reading of Image

- Use the function `cv2.imread()` to read an image.
- The image should be in the working directory or a full path of image should be given.

Second argument is a flag which specifies the way image should be read.

- ***cv2.IMREAD_COLOR:*** It specifies to load a color image. Any transparency of image will be neglected. It is the default flag. Alternatively, we can pass integer value **1** for this flag.
- ***cv2.IMREAD_GRAYSCALE:*** It specifies to load an image in grayscale mode. Alternatively, we can pass integer value **0** for this flag
- ***cv2.IMREAD_UNCHANGED:*** It specifies to load an image as such including alpha channel. Alternatively, we can pass integer value **-1** for this flag

Code: reading.py

```
import numpy as np
import cv2
# Load an color image in grayscale
img = cv2.imread('img.jpg',0)
```

Display Image

- Use the function `cv2.imshow()` to display an image in a window. The window automatically fits to the image size.
- First argument is a window name which is a string. second argument is our image. You can create as many windows as you wish, but with different window names.

```
cv2.imshow('image',img)
```

Display Image

- **cv2.waitKey()** is a keyboard binding function. Its argument is the time in **milliseconds**. The function waits for specified milliseconds for any keyboard event. If you press any key in that time, the program continues. If 0 is passed, it waits indefinitely for a keystroke.
- **cv2.destroyAllWindows()** simply destroys all the windows we created.

```
cv2.waitKey(0)
```

```
cv2.destroyAllWindows()
```


Write Image

- Use the function `cv2.imwrite()` to save an image.
- First argument is the file name, second argument is the image you want to save.

```
cv2.imwrite('image.png',img)
```

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Thank You