

How to install dlib

by Adrian Rosebrock on March 27, 2017 in dlib, Libraries, Tutorials

58



Two weeks ago I interviewed Davis King, the creator and chief maintainer of the dlib library.

Today I am going to demonstrate how to install dlib with Python bindings on both *macOS* and *Ubuntu*.

I highly encourage you to take the time to install dlib on your system over the next couple of days.

Starting next week we'll be diving head first into one of dlib's core computer vision implementations — *facial landmark detection*.

I'll be demonstrating how to use facial landmarks for:

- Face part (i.e., eyes, nose, mouth, etc.) extraction
- Facial alignment
- Blink detection
- ...and much more.

But it all starts with getting dlib installed!

To learn how to install dlib with Python bindings on your system, just keep reading.

How to install dlib

Developed by Davis King, the dlib C++ library is a cross-platform package for threading, networking, numerical operations, machine learning, computer vision, and compression, placing a strong emphasis on *extremely high-quality* and *portable code*. The documentation for dlib is also quite *fantastic*.

From a computer vision perspective, dlib has a number of state-of-the-art implementations, including:

- Facial landmark detection
- Correlation tracking
- Deep metric learning

Over the next few weeks we'll be exploring some of the detection), so definitely take the time now to get dlib or

Step #1: Install dlib prerequisites

The dlib library only has four primary prerequisites:

- Boost: Boost is a collection of peer-reviewed (i.e programmers not get caught up in reinventing the algebra, multithreading, basic image processing,
- **Boost.Python:** As the name of this library suggethe C++ and Python programming language.
- CMake: CMake is an open-source, cross-platfor software. You might already be familiar with CMa system.
- X11/XQuartx: Short for "X Window System", X11
 common on Unix-like operating systems. The macOS/OSX version of X11 is called XQuartz.

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I'll show you how to install each of these prerequisites on your Ubuntu or macOS machine below.

Ubuntu

Installing CMake, Boost, Boost, Python, and X11 can be accomplished easily with apt-get:

```
How to install dlib

1 $ sudo apt-get install build-essential cmake
2 $ sudo apt-get install libgtk-3-dev
3 $ sudo apt-get install libboost-all-dev
```

I assume you already have pip (for managing, installing, and upgrading Python packages) installed on your machine, but if not, you can install pip via:

```
How to install dlib

1 $ wget https://bootstrap.pypa.io/get-pip.py
2 $ sudo python get-pip.py
```

After completing these steps, continue to Step #2.

macOS

In order to install Boost, Boost.Python, and CMake on macOS, you'll be using the Homebrew package manager. Think of Homebrew as a similar equivalent of Ubuntu's apt-get only for macOS.

If you haven't already installed Homebrew, you can do so by executing the following commands:

```
How to install dlib

1 $ /usr/bin/ruby -e "$(curl -fsSL https://raw.githubusercontent.com/Homebrew/install/master/ins2 $ brew update
```

Hint: You can check if Homebrew is already installed on your machine by executing the <u>brew</u> command in your terminal. If you get a <u>brew: command not found</u> error, then Homebrew is not installed on your machine.

Now that Homebrew is installed, open up your ~/.ba

How to install dlib 1 \$ nano ~/.bash_profile

And update your PATH variable to check for package of your system:

```
How to install dlib

1 # Homebrew
2 export PATH=/usr/local/bin:$PATH
```

After updating your ~/.bash_profile file, it should k

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We now need to reload the contents of the ~/.bash_r

How to install dlib

This command only needs to be executed *once*. Alternatively, you can open up a new terminal window which will *automatically* source the ~/.bash_profile for you.

Next, let's install Python 2.7 and Python 3:

```
How to install dlib

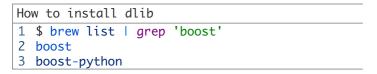
1 $ brew install python
2 $ brew install python3
```

We can then install CMake, Boost, and Boost.Python:



Once you start the boost-python install, consider go time (10-15 minutes).

As a sanity check, I would suggest validating that you before proceeding:



As you can see from my terminal output, both Boost a

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The last step is to install the XQuartz window manager so we can have access to ATT. Aquartz is easy to install — just download the ...dmg and run the install wizard. After installing, make sure you logout and log back in!

Fun Fact: XQuartz used to be installed by default on OSX 10.5-10.7. We now need to manually install it.

Now that we have our prerequisites installed, let's continue to our next (optional) step.

Step #2: Access your Python virtual environment (optional)

If you have followed any of my PylmageSearch tutorials on installing OpenCV, then you are likely using Python virtual environments.

Using Python's virtualenv and virtualenvwrapper libraries, we can create *separate, independent* Python environments for each project we are working on — this is considered a **best practice** when developing software in the Python programming language.

Note: I've already discussed Python virtual environm so I won't spend any more time discussing them here

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please see any of my installing OpenCV tutorials.

If you would like to install dlib into a *pre-existing* Python virtual environment, use the workon command:

How to install dlib Shell \$ workon <your virtualenv name>

For example, if I wanted to access a Python virtual environment named |cv|, I would use the command:

How to install dlib Shell \$ workon cv

Notice how my terminal window has changed — the text | (cv) | now appears before my prompt, indicating that I am in the cv Python virtual environment.



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Otherwise, I can create an entirely separate virtual er the command below creates a Python 2.7 virtual envi

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How to install dlib Shell 1 \$ mkvirtualenv py2_dlib

While this command will create a Python 3 virtual environment named py3_dlib:

How to install dlib Shell \$ mkvirtualenv py3_dlib -p python3

Again, please keep in mind that using Python virtual environments are optional, but highly recommended if you are doing any type of Python development.

For readers that have followed my previous OpenCV install tutorials here on the PylmageSearch blog, please make sure you access your Python virtual environment before proceeding to Step #3 (as you'll need to install the Python prerequisites + dlib into your virtual environment).

Step #3: Install dlib with Python bindings

The dlib library doesn't have any real Python prerequi computer vision or image processing, I would recomr

- NumPy
- SciPy
- scikit-image

These packages can be installed via pip:

```
How to install dlib

1 $ pip install numpy
2 $ pip install scipy
3 $ pip install scikit-image
```

Years ago, we had to compile dlib manually from source (similar to how we install OpenCV). However, we can now use pip to install dlib as well:

```
How to install dlib

1 $ pip install dlib
```

This command will download the dlib package from F compile and install it on your system.

Provided you have the CMake, Boost, Boost.Python, command should exit without error (leaving you with

I would suggest going out for a nice cup of coffee as finish.

After coming back, you should see that dlib has been

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The same goes for my Ubuntu install as well:

```
🗎 🗊 adrian@pyimagesearch: ~
(cv) adrian@pyimagesearch:~$ pip install dlib
Collecting dlib

Downloading dlib-19.4.0.tar.gz (4.0MB)
    100% |
                                             4.0MB 324kB/s
Building wheels for collected packages:
                                           dlib
  Running setup.py bdist_wheel for dlib ... done
  Stored in directory: /home/adrian/.cache/pip/wheels/9f/a3/5a/8ab6d5b6384f70339
2281e40e34d860435fe2fea6cc4d8947e
Successfully built dlib
Installing collected packages: dlib
Successfully installed dlib-19.4.0
(cv) adrian@pyimagesearch:~$
                                               on computer vision &
                                               image search engines
```

Figure 4: Installing dlib with

Step #4: Test out your dlib install

To test out your dlib installation, just open up a Pytho environment if you used them), and try to import the

```
How to install dlib
  $ python
2 Python 3.6.0 (default, Mar 4 2017, 12:32:34)
  [GCC 4.2.1 Compatible Apple LLVM 8.0.0 (clang-
  Type "help", "copyright", "credits" or "licens
5 >>> import dlib
6 >>>
```

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```
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```

```
↑ adrianrosebrock — ssh — 124×32

(cv) DU400:~ admin$ python
Python 3.6.0 (default, Mar 4 2017, 12:32:34)
[GCC 4.2.1 Compatible Apple LLVM 8.0.0 (clang-800.0.42.1)] on darwin
Type "help", "copyright", "credits" or "license" for more information.
>>> import dlib
>>>
       Figure 5: Testing out my dlib + Python install on macOS and Python 3.6.
```

If you've installed dlib into the same Python virtual en access OpenCV as well via your cv2 bindings. Here

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```
How to install dlib

1 $ python

2 Python 2.7.12 (default, Jul 1 2016, 15:12:24)

3 [GCC 5.4.0 20160609] on linux2

4 Type "help", "copyright", "credits" or "license" for more information.

5 >>> import dlib

6 >>> import cv2

7 >>> cv2.__version__

8 '3.1.0'

9 >>>
```

```
🗦 🗊 adrian@pyimagesearch: ~
(cv) adrian@pyimagesearch:~$ python
ython 2.7.12 (default, Jul 1 2016, 15:12:24)
[GCC 5.4.0 20160609] on linux2
ype "help", "copyright", "credits" or "license"
>> import cv2
                                                  Free 21-day crash course
>> cv2.__version_
3.1.0'
                                                  on computer vision &
                                                  image search engines
                                                  Interested in computer vision and image search
                                                  engines, but don't know where to start? Let me
                                                  help. I've created a free, 21-day crash course that
                                                  is hand-tailored to give you the best possible
                                                  introduction to computer vision. Sound good?
                                                  Enter your email below to start your journey to
                                                  becoming a computer vision master.
          Figure 6: Validating that I can import both dl
                                                   Email Address
```

Congratulations, you now have dlib installed on your

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Summary

In today's blog post I demonstrated how to install the dlib library with Python bindings on Ubuntu and macOS.

Next week we'll start exploring how to use dlib; specifically, facial landmark detection.

You won't want to miss this tutorial, so to be notified when the next post is published, be sure to enter your email address in the form below!

See you next week!

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ImageNet: VGGNet, ResNet, Inception, and Xception with Ke

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68 Responses to How to install dlib



Sanket March 27, 2017 at 11:10 am #

Can you install dlib on Windows? If so, how?

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Adrian Rosebrock March 28, 2017 at 12:59

Please see my reply "Anoynmous" below.

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Abkul Orto March 27, 2017 at 11:26 am #

REPLY 🦴

Hello Adrian.

Thanks for sharing this amazing and exciting C++ library. Kindly advice the right/stable version of Ubuntu to install.



Adrian Rosebrock March 28, 2017 at 12:57 pm #

REPLY 🦴

I've personally tested these instructions with both Ubuntu 14.04 and 16.04. Both work.

Hi Adrian,

Will pip also install the tool for bounding box annotation?

If anyone's interested in installing dlib the compile or pip way on Raspberry Pi, remember to increase your swap memory in "/etc/dphys-swapfile"

Cheers, Tom



Adrian Rosebrock March 28, 2017 at 12:57 pm #

REPLY 🦴

X

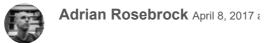
Unfortunately, no. For that you will need to compile dlib from source.



Daniella Solomon April 7, 2017 at 7:21

Ηi

How much you recommend to increase the m (I have your built raspberry pi image)



You can increase memory on the the GPU via raspi-config.

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Brian Norman April 26, 2017 :

I also had the MemoryError problem installing scipy on my Pi 3. Using pip's –no-cache-dir switch allowed the install to complete 0k.

It might be worth adding that to your excellent instructions.

Adrian Rosebrock April 26, 2017 at 6:50 am #

Hey Brian — I'm actually doing an entirely separate tutorial for installing dlib on the Raspberry Pi next week (1 May 2017). It will include a few additional tips to help get dlib installed on the Pi.

Brian No

Brian Norman April 27, 2017 at 3:42 am #

You might want to look at my me about 3 days to get openCV and a



Zethembiso Msomi March 27, 2017 at 11:46 am #

Is it possible to install this on a Raspberry Pi?



REPLY 🦴

X

Yes, absolutely. Ubuntu and Raspbian are Debian-based so you can actually use the Ubuntu instructions to install dlib on your Raspberry Pi.



Simba March 27, 2017 at 2:25 pm #

Thanks a lot. Was having trouble installing. Ic



Adrian Rosebrock March 28, 2017 at 12:55

Thanks Simba — and congrats on getting

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Anoynmous March 28, 2017 at 2:07 am #

Can we have a same installation process for

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Adrian Rosebrock March 28, 2017 at 12:53 pm #



I do not have any plans to create a Windows install tutorial nor support Windows on the PylmageSearch blog. Please refer to dlib official site for Windows instructions. When it comes to learning computer vision (or most advanced science techniques), I would encourage you to use a Unix-based system.



J. Gravett April 2, 2017 at 5:29 am #

REPLY 🦴

Wow, that's not exactly helpful. I guess now 'I do not have any plans', either...to spend my money on your products.

REPLY 🖴

I wish I could offer Windows support, but there are honestly too many logistical issues. I offer almost 200 free tutorials here on the PylmageSearch blog. I hope you enjoy them. If you don't want to purchase any of the teaching products here on PylmageSearch, you don't have to — no one is asking you to or forcing you to. Enjoy the content and I hope it helps you on your computer vision journey. But please keep in mind that I am just one person and there are limitations to what I can provide. I've found that Unix-based environments are the most useful when building computer vision applications (the exception being if you want to build a Windows app, of course). If you have a Windows-specific question, I am not the right person to ask.



Peter Lunk April 19, 2017 at 7:05 an

Have you concidered adding an with Ubuntu nstalled aside your windows This is what I did...



Thierry Jeanneret May 2, 2017 at

Hello, why don't you work on a v Python stuff works much better on a Linux free, you can get VirtualBox from https://v Just install it on your Windows system, cr the Ubuntu VM and than follow the directi step, its a breeze.

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Royi March 28, 2017 at 2:36 am #

Hi Adrian.

Great post!

I have a nice idea for you.

Why don't you show how to use DLib to learn the 194 Facial Landmarks of the HELEN database (Remember to augment the database by mirroring the images)?

It would be great and will create a new trained predictor for the users of DLib.

Thank You.



The dlib library ships with a facial landmark detector? Are you asking me to demonstrate how to train that detector from scratch? Keep in mind that most of the dlib functionality doesn't have Python bindings, only C++.



Royi March 31, 2017 at 9:18 am #

REPLY 🦴

X

Hi Adrian,

Yes, I was talking about training it for a new job. My idea was 194 Points of the HELEN database.

Thank You.



Michael George March 28, 2017 at 4:50 am #

Thanks for a great post again!

I had installed dlib a few days back. I am working in a experience was that there were a few incompatibilities from pip.

After toiling for a few days, was able to get dlib working source.

So if any one is facing difficulty in working with Anaco Adrian, I am eagerly waiting for your future posts on d

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Adrian Rosebrock March 28, 2017 at 12:51 pm #

REPLY 🦴

Congrats on getting dlib installed Michael. And thank you for being willing to help Anaconda

users.

JBeale March 29, 2017 at 11:46 am #

REPLY 🦴

Good to know. I had Anaconda and couldn't get dlib going due to a boost problem. Finally, simply re-installed Ubuntu from scratch; after that dlib installed OK per instructions here.



Murthy March 30, 2017 at 3:23 am #

REPLY 5

Thanks Adrian. I installed dlib – on Linux 16.04 po issues at all Look for ward to facial landmark detection



Adrian Rosebrock March 31, 2017 at 1:52 pm #

REPLY 🦴

Congrats on getting dlib installed Murthy, nice job!



Neeraj Kumar April 1, 2017 at 12:04 pm #

REPLY 🦴

Dear Adrian.

Thanks a ton man. Just struck the Ubuntu + OpenCV + Python + Dlib installation and configuration in one go. It's just because of you.

Regards Neeraj Kumar





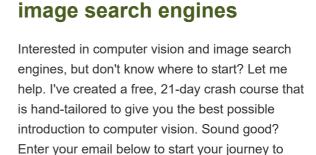
Adrian Rosebrock April 3, 2017 at 2:08 pm

Thank you for the kind words Neeraj — a



Tony April 1, 2017 at 5:48 pm #

Straightforward install due to the very clear ir



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on computer vision &

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Adrian Rosebrock April 3, 2017 at 2:05 pm

Thank you Tony!

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Yash Bafna April 4, 2017 at 3:15 am #

REPLY 🦴

Great post!! Very well explained!!



Adrian Rosebrock April 5, 2017 at 12:01 pm #

REPLY 🦴

Thanks Yash! :





Matheus April 7, 2017 at 11:33 am #

Adrian Rosebrock April 8, 2017 at 12:47 pm

REPLY 🦴

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X

99.9% of the time you'll see a segmentation fault error when you try to import dlib into a *different* version of Python than it was compiled against. I would suggest compiling dlib from source rather than using pip.



Anonymous April 8, 2017 at 3:38 pm #

Hello Adrian,

I am trying to install dlib library on raspberry pi 3.

The commands in step 3 to install three packages we command.

In the last step "pip install dlib", it is stuck there (It was commands) like:

\$ pip install dlib
Collecting dlib
Using cached dlib-19.4.0.tar.gz
Building wheels for collected packages: dlib
Running setup.py bdist_wheel for dlib ... /

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Adrian Rosebrock April 12, 2017 at 1:51 pm #

REPLY 🦴

The install is likely not "stuck". It can take 10 minutes to install dlib on a standard laptop/desktop. On a Raspberry Pi this number can jump to an hour. If you run top you'll see that your system is busy compiling dlib.



please guide us

yasar April 30, 2017 at 11:55 am #

REPLY 🦴

i am working on raspberry pi too. It took about 4-5 hours to finish



Anil Adhikari April 11, 2017 at 6:38 pm #

REPLY 🖴

Hello Adrian,

I followed this tutorial to install dlib in python. Everythi

dlib. When i ran the command "pip install dlib" it gives two error "Failed building wheel for dlib" and "error: cmake configuration failed!".

What could be the reason behind this?

Thanks in advance.

Adrian Rosebrock April 12, 2017 at 1:04 pm #

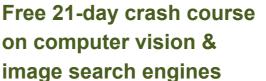
REPLY 🦴

It sounds like the internal CMake script could not configure dlib correctly. Did you install all the dependencies without error? You have might to resort to compiling dlib from source.



eggs April 15, 2017 at 3:35 pm #

i tried over and over , while install dli cmake build failed.



×



Adrian Rosebrock April 16, 2017

Which operating system are you

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eggs April 16, 2017 at 11:51 am #

raspi 2 - raspian 4.4.50-v7+

Email Address

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eggs April 19, 2017 at 11:38 am #

i tried on your pre-installed package for raspi and i get same error again.

Adrian Rosebrock April 19, 2017 at 12:42 pm #

I'm writing a tutorial dedicated to installing dlib on the Raspberry Pi. It will go live at the end of this month. The tutorial will resolve any issues installing dlib on the Raspberry Pi.



jianbo wang April 24, 2017 at 11:12 am #

REPLY 🦴

Hello, Adrian Rosebrock your blog help me a lot, thanks, and let me help others

for how to install dlib on windows

1. install python 3.5 32bit, can be download here https://www.python.org/downloads/release/python-353/

2.download dlib from here

https://pypi.python.org/pypi/dlib/18.17.100

select "dlib-18.17.100-cp35-none-win32.whl (md5)" last, run pip install dlib-18.17.100-cp35-none-win32.whl

it success from my 32bit win7



Adrian Rosebrock April 24, 2017 at 12:04 p

Thanks for sharing!



Brian Norman April 27, 2017 at 3:40 am #

Installing DLIB was hanging my RPi 3 (1Gb r

I've been struggling with this for a couple of days tryin your config which allows it to install in 10 minutes. I'm tried this)

Today I increased the size of the dphys-swapfile to 10 The Raspian default is 100Mb on the SD card! Of cou 'wear out' the SD card if a lot of swapping takes place

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Anyway, whilst running the 'pip install dlib' command I also fired off top – 'swap used' peaked at 500Mb so far – no wonder it hung with the default swap setting. I noted that my Pi is a lot more responsive to user input during the install having done this (previously I had to pull the plug to get it back)

Yay, the install has just this second completed without error – and probably in less than 20 minutes (I didn't time it exactly)- now to follow your blog.

Having done that I'll now restore the original swapfile and reboot.

For others with similar hanging issues this is what I did (after a few hours of web searching).

- 1 find a USB powered hard drive (I had a Philips 300Gb not doiung anything) and plug it in.
- 2 note mount path (something like /media/pi/philips in my case)

3 sudo nano /etc/dphys-swapfile

set the following values :-

CONF SWAPFILE=/media/pi/philips/swap (use your own values)

CONF_SWAP_SIZE=1024

save and exit

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4 issue these commands sudo /etc/init.d/dphys-swapfile stop sudo /etc/init.d/dphys-swapfile start

5 install dlib with the 'pip install dlib' command 6 when completed restore your /etc/dphys-swapfile settings 7 re-run the commands at step 4

Now you can dismount the usb drive and use it for some other purpose.

Adrian Rosebrock April 28, 2017 at 9:37 ar

Hi Brian — I'm actually detailing an entire

Raspberry Pi. It's already written and set to publis

swap settings similar to yours. You actually don't

Note I also made another post about using -no-cache-dir when installing scipy

When my Pi camera turns up I can get now on with facial feature recognition.

Oh, and one last recommendation. Having suffered so many biccurs on the route I took the precaution of imaging my SD card after each major stage. I use Wir

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Roman April 28, 2017 at 4:02 am #

I installed dlib but how can I install Sym-link ι

installed

1. dlib (virtual environment)

swap file size.

- keras_tf (virtual environment)
- 3. OpenCV

It would be nice to have Sym-link with all of them.

Email Address

LET'S DO IT!

Adrian Rosebrock April 28, 2017 at 9:20 am #

You would need to find the location to your cv2.so first. Normally it would be in /usr/local/lib/python2.7/site-packages/cv2.so, but you'll want to check on your own machine first.

From there, change directory to your site-packages directory of the virtual environment and then sym-link in OpenCV:

1 \$ cd ~/.virtualenvs/your_env_name/lib/python2.7/site-packages/

2 \$ ln -s /path/to/cv2.so cv2.so

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REPLY 🦴



How to implement the paper "Max-Margin Object Detection" based on Structured SVM by Python, which is written by Davis King? Can you give a example in your blog? Maybe, it is a good topic for your course!

Adrian Rosebrock May 8, 2017 at 12:45 pm #

REPLY 🦴

The method is already implemented inside the dlib library. I would suggest looking at the dlib source code if you're interested in the algorithm itself.



Owais May 13, 2017 at 8:14 am #

I am using Raspberry Pi 3 and when i installe work on Python 2.7.

I want it to work on Python 2.7 because when i type "i is no module named 'cv', while on 2.7 i can import cv.

Thank you!

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Adrian Rosebrock May 15, 2017 at 8:49 an

This sounds like an issue with your Pythopost where I provide instructions on how to install

Email Address

LET'S DO IT!



Ansh Verma May 16, 2017 at 9:55 pm #

REPLY 🦴

Hi Adrian,

Appreciate your blog on installing the dlib library. I do wish to ask you of an error as when I am installing the dlib it gets stuck while compiling the trainer.cpp as a result the installation of the dlib freezes.

I read on stackoverflow that we have to manually compile the cpp examples? I am running on py2.7.9 virtual env. Any suggestions would be helpful.



Adrian Rosebrock May 17, 2017 at 9:51 am #

REPLY 🦴

Which operating system/hardware are you trying to compile dlib on?



I am running it on raspberry pi 3: Raspbian GNU/ Linux 8 (jessie).



Adrian Rosebrock May 18, 2017 at 11:54 am #

REPLY 🦴

X

Please use this tutorial to install dlib on your Raspberry Pi.



Ampharos May 17, 2017 at 12:55 am #

I installed dlib in Ubuntu 16.04 following this My problem is that face detection is a really slow proc support for AVX extensions but I don't know how to m just did it through pip(pip install dlib).



Adrian Rosebrock May 17, 2017 at 9:49 an

Congrats on getting OpenCV installed Aı

As far as face detection goes, you'll want to comp covering how to speedup the dlib library for face c

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Madhu Oruganti May 20, 2017 at 2:21 am #

Hi,

I perfromed all the steps but it is not mapping to cv environment like No module cv2 in the python dlib can you please suggest me

Adrian Rosebrock May 21, 2017 at 5:14 am #

REPLY 🦴

Please see the other comments in this post. You need to sym-link your cv2.so bindings into the Python virtual environment you used for dlib.

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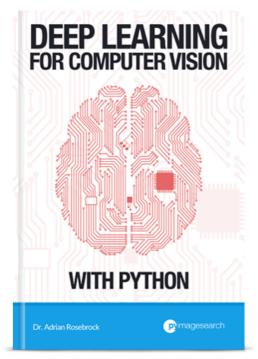
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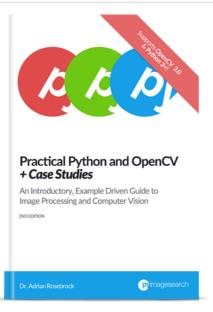
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