

Menggunakan Raspberry pi 3 untuk menjalankan OpenCV

27 November 2018 15:29

Raspberry pi 3

(<https://www.raspberrypi.org/products/raspberry-pi-3-model-b-plus/>)

Hardware:

The Raspberry Pi 3 Model B+ is the latest product in the Raspberry Pi 3 range.

- Broadcom BCM2837B0, Cortex-A53 (ARMv8) **64-bit SoC @ 1.4GHz**
- 1GB LPDDR2 SDRAM
- 2.4GHz and 5GHz IEEE 802.11.b/g/n/ac wireless LAN, Bluetooth 4.2, BLE
- Gigabit Ethernet over USB 2.0 (maximum throughput **300 Mbps**)
- Extended 40-pin GPIO header (digital I/O)
- Full-size HDMI (display)
- 4 USB 2.0 ports
- CSI camera port for connecting a Raspberry Pi camera
- DSI display port for connecting a Raspberry Pi touchscreen display
- 4-pole stereo output and composite video port
- Micro SD port for loading your operating system and storing data (minimal 8GB)
- 5V/2.5A DC power input
- Power-over-Ethernet (PoE) support (requires separate PoE HAT)

From <<https://www.raspberrypi.org/products/raspberry-pi-3-model-b-plus/>>

SOFTWARE:

- Sistem operasi disimpan dalam Micro SD memory, min 8 GB
- Jenis sistem operasi: Linux (Raspbian)
- Instalasi:
 - Download: Raspbian

The screenshot displays the Raspberry Pi website's download section for Raspbian Stretch. It features three main download options, each with a Raspberry Pi logo icon and detailed metadata.

Image Name	Version	Release Date	Kernel Version	Release Notes	Download Links
RASPBIAN STRETCH WITH DESKTOP AND RECOMMENDED SOFTWARE	November 2018	2018-11-13	4.14	Link	Download Torrent, Download ZIP
RASPBIAN STRETCH WITH DESKTOP	November 2018	2018-11-13	4.14	Link	Download Torrent, Download ZIP
RASPBIAN STRETCH LITE	November 2018	2018-11-13	4.14	Link	Download Torrent, Download ZIP

SHA-256 hashes are provided for each image to ensure integrity:

- For Desktop and Recommended Software: `00a644539fda4e19ec7ceb29e61c049b52ba45b1a21cdec91fa54bd59d660d2`
- For Desktop: `a121652937c0de1c2583fe77d1c0a0407f2cd248327df2901e4716649ac9bc97`

RASPBIAN STRETCH WITH DESKTOP AND RECOMMENDED SOFTWARE (sudah di lengkapi dengan beberapa aplikasi yang umum digunakan)

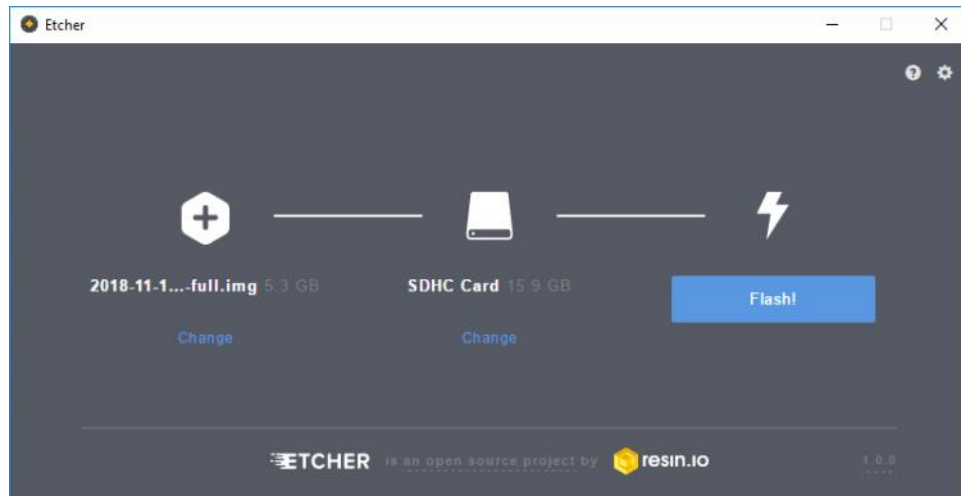
RASPBIAN STRETCH WITH DESKTOP (dilengkapi dengan GUI interface)

RASPBIAN STRETCH LITE (no GUI) tetapi ukura file image (backup file system) paling kecil

File yang sudah di download harus di ekstrak :

.zip -> .img (biasanya ukurannya akan menjadi 3 sampai 4x lebih besar)

Selanjutnya file *.img di tuliskan ke dalam Micro SD, dengan menggunakan software tools Etcher (<https://etcher.io>) 66.9 MB



Selanjutnya hasil penulisan file *.img ke dalam SD-Card dapat digunakan sebagai boot system dalam raspberrypi. (tidak perlu proses instalasi, seperti pada file *.iso)

Remote akses menggunakan SSH:

Pastikan SSH aktif/enable pada raspberry:

Identifikasi IP ADDRESS raspberry: `ifconfig`

```
pi@raspberrypi: ~  
Debian GNU/Linux comes with ABSOLUTELY NO WARRANTY, to the extent  
permitted by applicable law.  
Last login: Tue Dec  4 16:10:30 2018 from 10.8.8.21  
pi@raspberrypi:~$ ifconfig  
eth0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500  
    inet 10.8.8.14 netmask 255.255.255.0 broadcast 10.8.8.255  
    inet6 fe80::aae2:53e0:3d0f:6dac prefixlen 64 scopeid 0x20<link>  
    ether b8:27:eb:60:6e:ce txqueuelen 1000 (Ethernet)  
    RX packets 7772 bytes 387635 (378.5 KiB)  
    RX errors 0 dropped 7 overruns 0 frame 0  
    TX packets 162 bytes 21971 (21.4 KiB)  
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0  
  
lo: flags=73<UP,LOOPBACK,RUNNING> mtu 65536  
    inet 127.0.0.1 netmask 255.0.0.0  
    inet6 ::1 prefixlen 128 scopeid 0x10<host>  
    loop txqueuelen 1000 (Local Loopback)  
    RX packets 9 bytes 524 (524.0 B)  
    RX errors 0 dropped 0 overruns 0 frame 0  
    TX packets 9 bytes 524 (524.0 B)  
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0  
  
wlan0: flags=4099<UP,BROADCAST,MULTICAST> mtu 1500  
    ether b8:27:eb:35:3b:9b txqueuelen 1000 (Ethernet)  
    RX packets 1428 bytes 146580 (143.1 KiB)  
    RX errors 0 dropped 131 overruns 0 frame 0  
    TX packets 34 bytes 5514 (5.3 KiB)  
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0  
  
pi@raspberrypi:~$
```

Pada contoh tampilan di atas, raspberrypi menggunakan UTP (Ethernet

port), label **eth0** untuk koneksi ke jaringan LAN/Internet, dengan ipaddress : **10.8.8.14**

Remote akses menggunakan SSH menggunakan PuTTY

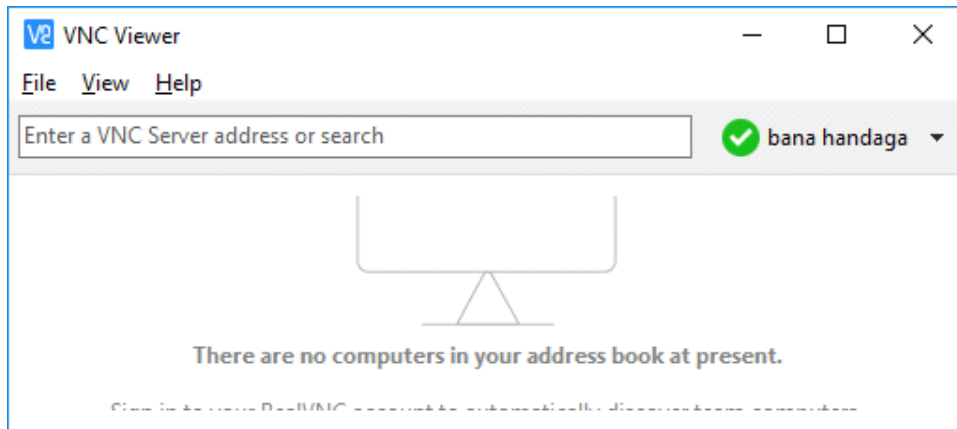
<https://www.putty.org/>

Download software Putty dari link di atas:

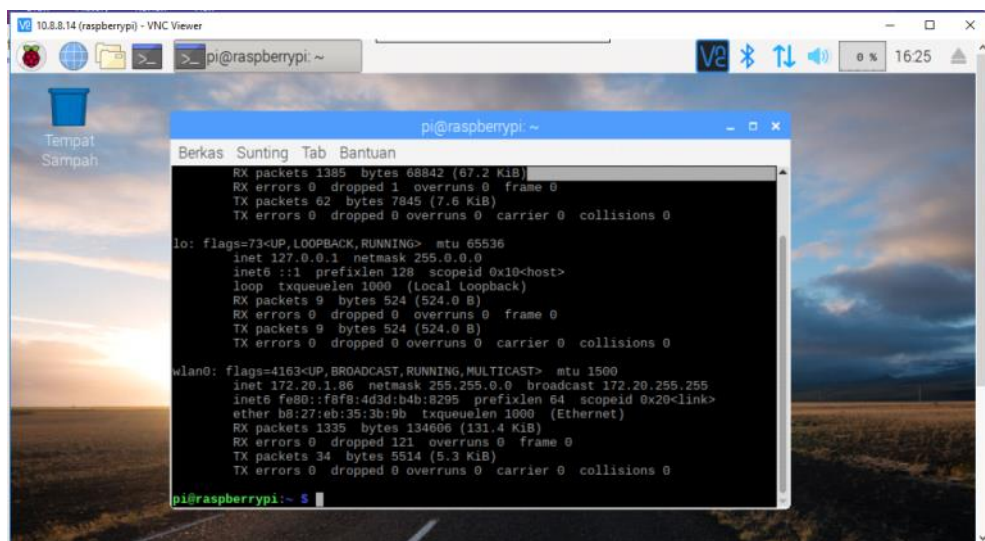
Remote akses berbasis GUI: "VNC Viewer" (free)

Download dan install VNC Viewer for windows dari link berikut:

<https://www.realvnc.com/en/connect/download/viewer/windows/>



Contoh tampilan REMOTE AKSES dengan menggunakan VNC Client



Instalasi OpenCV 3.4.3 dalam Raspberry pi

Default python dalam raspbian adalah python 2.7 (tetapi pyhton3 sudah terinstall dalam folder /usr/bin/pyhton3)

Jika menggunakan Python 2.7 dapat langsung dinstall OpenCV, disarankan membuat "virtual Environment"

Contoh virtual untuk Python 2.7:

Instalasi modul virtualenv

- Buka terminal
- Sudo pip install virtualenv

Membuat virtual environment python2.7

- virtualenv venv27

Tunggu proses selesai, kemudian virtual environment akan terinstall pada direktori "venv27":

```
pi@raspberrypi: ~  
pi@raspberrypi:~$ virtualenv venv27  
Running virtualenv with interpreter /usr/bin/python2  
New python executable in /home/pi/venv27/bin/python2  
Also creating executable in /home/pi/venv27/bin/python  
Installing setuptools, pkg_resources, pip, wheel...done.  
pi@raspberrypi:~$ ls  
Desktop  Downloads  Music      Public     venv      Videos  
Documents  MagPi      Pictures   Templates  venv27  
pi@raspberrypi:~$
```

Mengaktifkan virtual environment python2.7 (dalam direktori 'venv27')

\$ source venv27/bin/activate

```
pi@raspberrypi: ~/p27  
activate.csh  easy_install  pip2  python2  wheel  
activate.fish  easy_install-2.7  pip2.7  python2.7  
pi@raspberrypi:~$ source venv27/bin  
-bash: source: venv27/bin: bukan sebuah direktori  
pi@raspberrypi:~$ source venv27/bin/activate  
(venv27) pi@raspberrypi:~$ mkdir p27  
(venv27) pi@raspberrypi:~$ cd p27  
(venv27) pi@raspberrypi:~/p27$ ^C  
(venv27) pi@raspberrypi:~/p27$
```

Instalasi opencv dalam virtual environment 2.7 and 3.5:

- opencv-python
- opencv-contrib-python

```
pi@raspberrypi: ~/p30  
permitted by applicable law.  
Last login: Tue Dec 4 16:34:08 2018 from 10.8.8.21  
pi@raspberrypi:~$ virtualenv -p /usr/bin/python3 venv3  
Already using interpreter /usr/bin/python3  
Using base prefix '/usr'  
New python executable in /home/pi/venv3/bin/python3  
Also creating executable in /home/pi/venv3/bin/python  
Installing setuptools, pkg_resources, pip, wheel...done.  
pi@raspberrypi:~$ mkdir p30  
pi@raspberrypi:~$ source venv3/bin/activate  
(venv3) pi@raspberrypi:~$ mkdir30  
-bash: mkdir30: perintah tidak ditemukan  
(venv3) pi@raspberrypi:~$ mkdir p30  
mkdir: tidak dapat membuat direktori 'p30': Berkas telah ada  
(venv3) pi@raspberrypi:~$ cd p30  
(venv3) pi@raspberrypi:~/p30$ python  
Python 3.5.3 (default, Sep 27 2018, 17:25:39)  
[GCC 6.3.0 20170516] on linux  
Type "help", "copyright", "credits" or "license" for more information.  
>>>
```

```
pi@raspberrypi: ~/p30
(venv3) pi@raspberrypi:~ $ mkdir p30
mkdir: tidak dapat membuat direktori 'p30': Berkas telah ada
(venv3) pi@raspberrypi:~ $ cd p30
(venv3) pi@raspberrypi:~/p30 $ python
Python 3.5.3 (default, Sep 27 2018, 17:25:39)
[GCC 6.3.0 20170516] on linux
Type "help", "copyright", "credits" or "license" for more information.
>>> exit()
(venv3) pi@raspberrypi:~/p30 $ pip install opencv-contrib-python
Looking in indexes: https://pypi.org/simple, https://www.piwheels.org/simple
Collecting opencv-contrib-python
  Downloading https://www.piwheels.org/simple/opencv-contrib-python/opencv_contr
ib_python-3.4.3.18-cp35-cp35m-linux_armv7l.whl (12.9MB)
    100% |████████████████████████████████████████| 12.9MB 743kB/s
Collecting numpy>=1.12.1 (from opencv-contrib-python)
  Downloading https://www.piwheels.org/simple/numpy/numpy-1.15.4-cp35-cp35m-linux_armv7l.whl (6.4M
B)
    100% |████████████████████████████████████████| 6.4MB 457kB/s
Installing collected packages: numpy, opencv-contrib-python
Successfully installed numpy-1.15.4 opencv-contrib-python-3.4.3.18
(venv3) pi@raspberrypi:~/p30 $
```