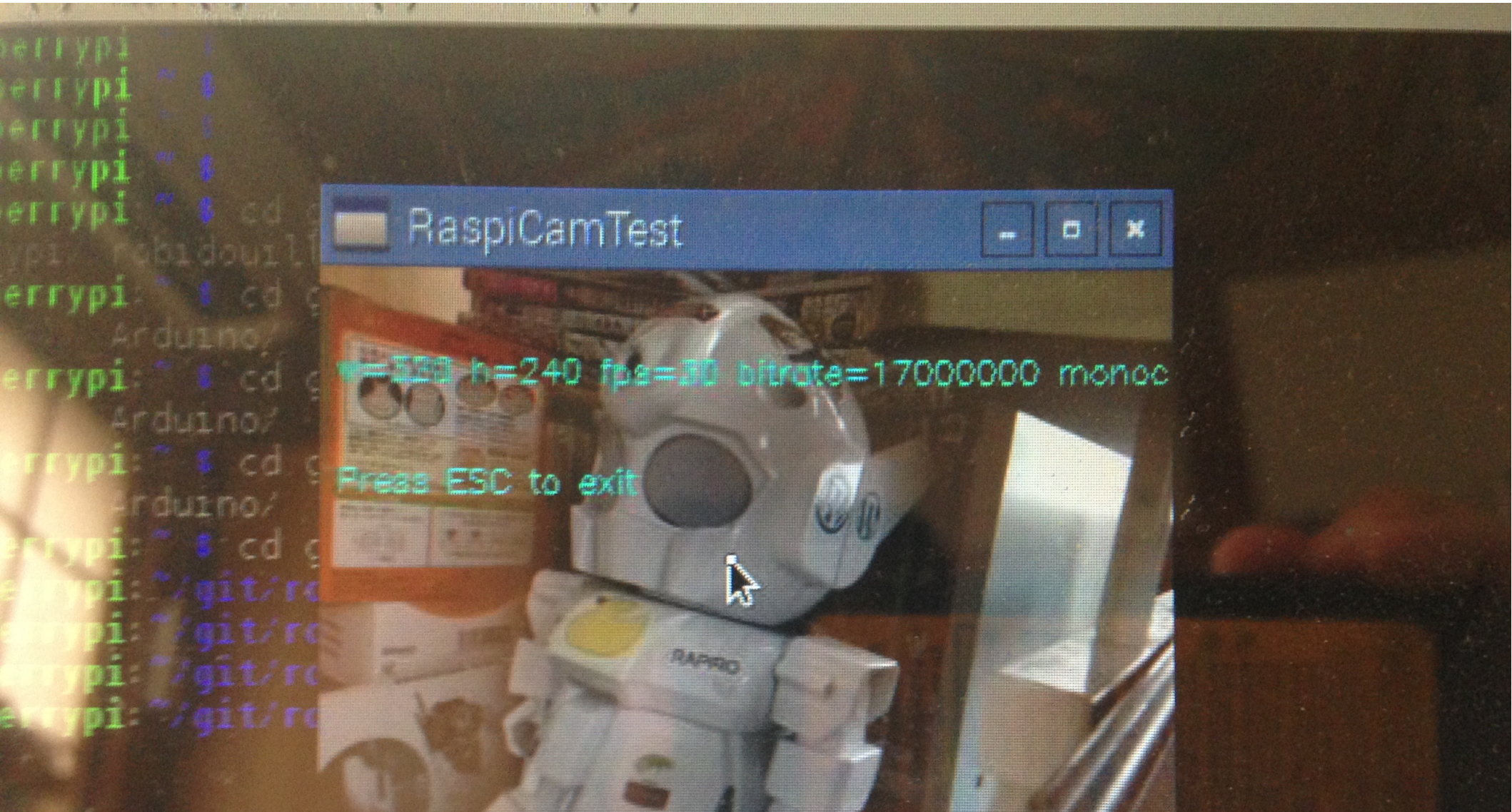
Raspberry Pi Using Open CV which Has The Installing ,making Programs And Performance



nabaua
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I work as IT infrastructure
as usual in Japan

Others:
Raspberry Pi, Zabbix, Linux, Drawing Picture
About the “Ahiruyaki” which means tweets returned
Messages on twitter, I’ve ever give a speech as
lightning talk in Riga Latvia.

Anyway,
I want to live in Europe if I have a chance.

Such like a this guy I’m thinking about that.

Agenda

1. What is Raspberry Pi ?
2. What does it mean by open CV ?
3. How to install ,compile open CV for Raspberry Pi
4. How to make the program in open CV for Raspberry Pi
5. How to use open CV for Raspberry Pi
6. Extras (What is this?)
7. Questions

1.What is Raspberry Pi?

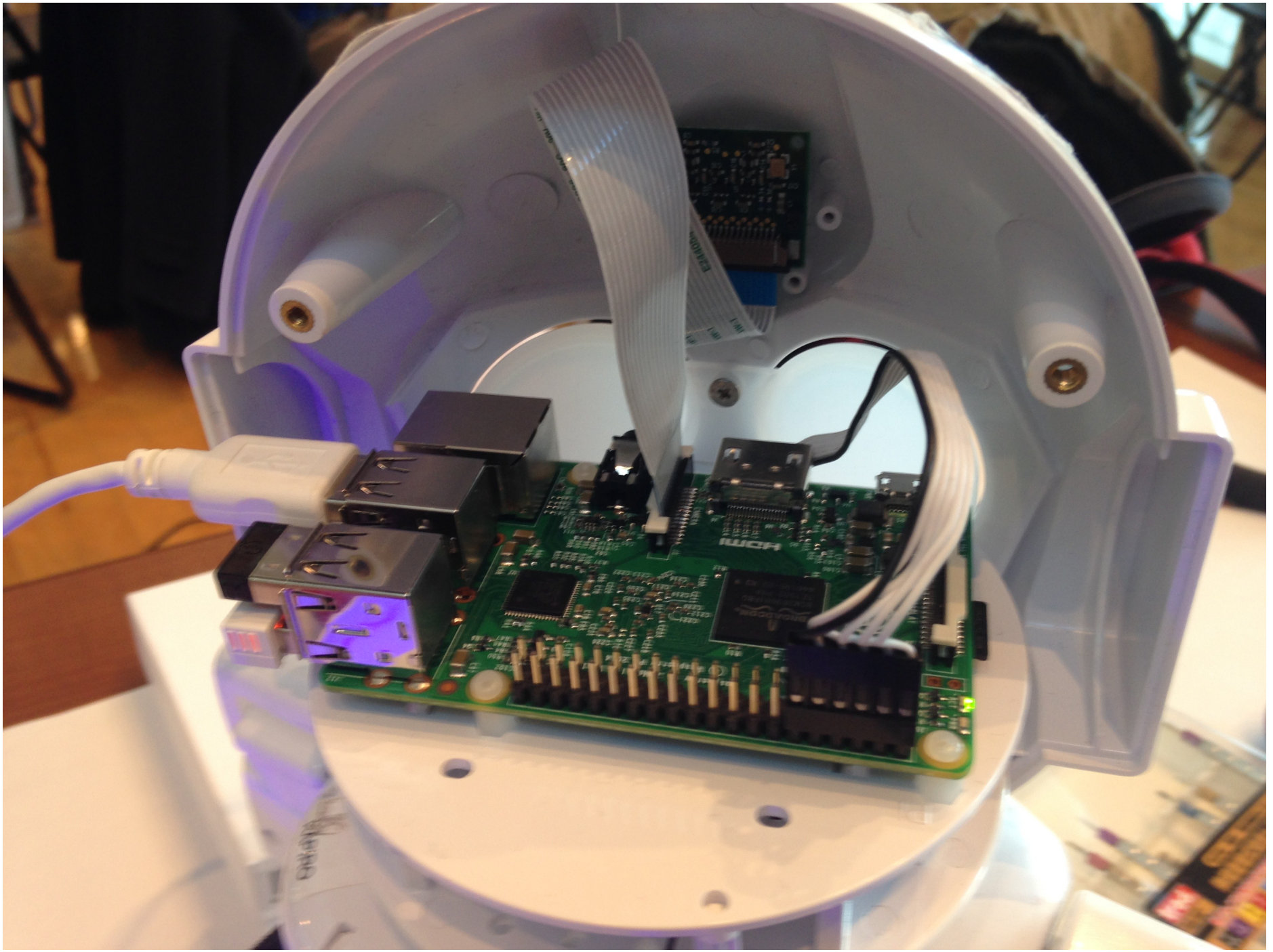
The Raspberry Pi is a series of credit card-sized single-board computers developed in the United Kingdom by the Raspberry Pi Foundation to promote the teaching of basic computer science in schools and developing countries.

You can customize and optimize whatever you want to do.

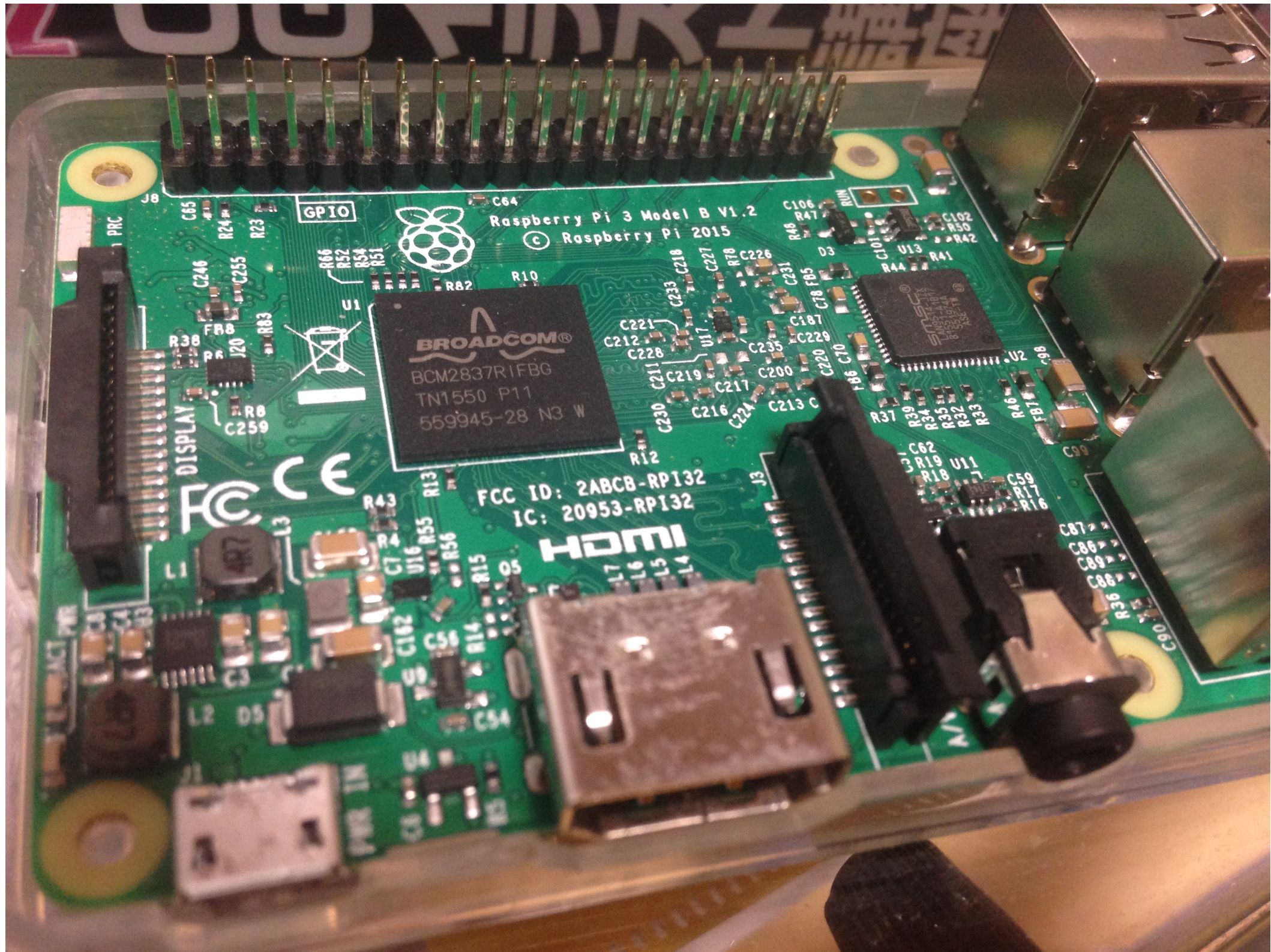
There are kinds of types

Model A/A+
Model B/B+
Model B++
Raspberry Pi 2
Raspberry Pi 3
Pi Zero

This type is Raspberry Pi 3 which is new one.




EDAC
1605
ETHERNET


GPIO
Raspberry Pi 3 Model B V1.2
© Raspberry Pi 2015
BROADCOM®
BCM2837RIFBG
TN1550 P11
559945-28 N3 W
FCC ID: 2ABCB-RPI32
IC: 20953-RPI32
HDMI
DISPLAY
RUN
PWR
ACT

Operating systems

The Raspberry Pi primarily uses Raspbian, a Debian-based Linux operating system.
Other third party operating systems available via the official website include Ubuntu MATE, Snappy Ubuntu Core, Windows 10 IoT Core, RISC OS and specialised distributions for the Kodi media center and classroom management.

Many other operating systems can also run on the Raspberry Pi.

Basically, Some of us use Raspbian, a Debian-based Linux operating system.
Of course, I’m using Raspbian, too.

So, I talk about Raspbian.

Ok Then.

2.What does it mean by open CV?

OpenCV is released under a BSD license and hence it’s free for both academic and commercial use. It has C++, C, Python and Java interfaces and supports Windows, Linux, Mac OS, iOS and Android. OpenCV was designed for computational efficiency and with a strong focus on real-time applications. Written in optimized C/C++, the library can take advantage of multi-core processing. Enabled with OpenCL, it can take advantage of the hardware acceleration of the underlying heterogeneous compute platform.

Adopted all around the world, OpenCV has more than 47 thousand people of user community and estimated number of downloads exceeding 9 million. Usage ranges from interactive art, to mines inspection, stitching maps on the web or through advanced robotics.

By using this, we are able to make a program as follows.

・Customizing and optimizing picture file and motion picture file
・Showing and tracing a picture with the camera
・Detecting face and body
・Extra

You can install open CV in Raspberry Pi or other operational system

Version

New version 3.1
For Raspberry Pi, it is better to use 2.4.13, because
It can’t be done for new version.

Download site
http://opencv.org/downloads.html
For Linux only if you use for Rasbian in Raspberry Pi

You can install open CV in Raspberry Pi or other operational system

3.How to install ,compile open CV for Raspberry Pi

Beforehand:
Make sure Raspbian is up to date:
#sudo apt-get update
#sudo apt-get upgrade

First do this:
#sudo apt-get -y install build-essential cmake cmake-curses-gui pkg-config libpng12-0 libpng12-dev libpng++-dev libpng3 libpnglite-dev zlib1g-dbg zlib1g zlib1g-dev pngtools libtiff4-dev libtiff4 libtiffxx0c2 libtiff-tools libeigen3-dev

You can add in cmake-qt-gui if you want a GUI for cmake, and don’t like ccmake.

#sudo apt-get -y install libjpeg8 libjpeg8-dev libjpeg8-dbg libjpeg-progs ffmpeg libavcodec-dev libavcodec53 libavformat53 libavformat-dev libgstreamer0.10-0-dbg libgstreamer0.10-0 libgstreamer0.10-dev libxine1-ffmpeg libxine-dev libxine1-bin libunicap2 libunicap2-dev swig libv4l-0 libv4l-dev python-numpy libpython2.6 python-dev python2.6-dev libgtk2.0-dev

Install Open CV (in case opencv 2.4.8):

#wget http://sourceforge.net/projects/opencvlibrary/files/opencv-unix/2.4.8/opencv-2.4.8.zip/download opencv-2.4.8.zip

git clone https://github.com/Itseez/opencv.git

Unzip and prepare for build
#unzip opencv-2.4.8.zip
#cd opencv-2.4.8
#mkdir release
#cd release
#ccmake ../

make
(It will take About 1 hour):
(Raspberry Pi 2 --- About 2hours):
(Raspberry Pi --- About 7hours):

sudo make install

That’s all:

4.How to make the program in open CV for Raspberry Pi

About the tracing picture with Web Camera in Python.

・Python install we need
・Setting web camera for Raspberry Pi

#lsusb
※confirming the camera device
Examples
Bus 001 Device 005: ID 056e:7016 Elecom Co., Ltd

```
#coding: utf-8

#calling open CV
import cv2

#the frame of camera
window Name=u'Camera'.encode('cp932')
cv2.namedWindow(windowName)

#calling camera picture
src = cv2.VideoCapture (0)

#It is better to deal with error about not being camera
If not src.isOpened():
    Print u 'We can't read camera'
    Import sys
```

```
#reading camera, stoping ESC key when you want
while True:

    retval, frame = src.read( )

    If frame is None:
        break

    Cv2.imshow(window.name, frame)

    key = cv2.waitKey(33)
    If key == 27:
        break

#End
    cv2.destroyAllWindows()
    src.release
```

Showing Performance Demo

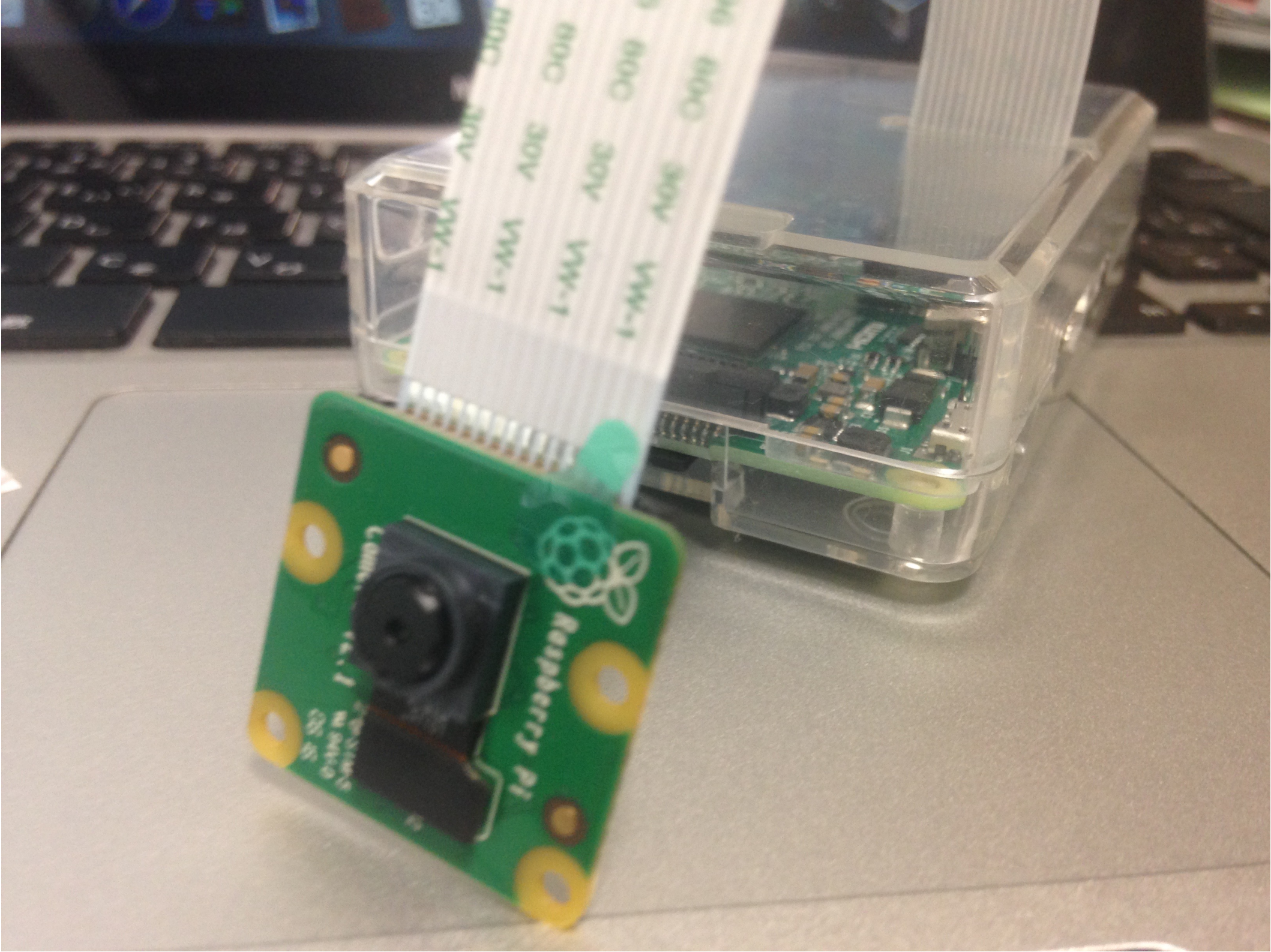
Raspberry Pi Camera for open CV

#raspi-config

In Display
1.Expand Filesystem

Enable support for Raspberry Pi camera?
→<Enable>

#reboot


Raspberry Pi

C++
raspicam_cv libraly

https://github.com/robidouille/robidouille/tree/master/raspicam_cv
You can download

apt-get install git

raspberry pi userland
mkdir ~/git
cd ~/git
mkdir raspberrypi
cd raspberrypi
git clone https://github.com/raspberrypi/userland.git
cd userland
./buildme

```
# cd  ~/git
# git clone https://github.com/robidouille/robidouille.git
# cd robidouille/raspicam_cv
```

You have to revise as follows with vi editor and so on.

before：CFLAGS_OPENCV = -I/usr/include/opencv

after　：CFLAGS_OPENCV = -I/usr/local/include/opencv

```
# mkdir objs
# make
```

(You can use and play)

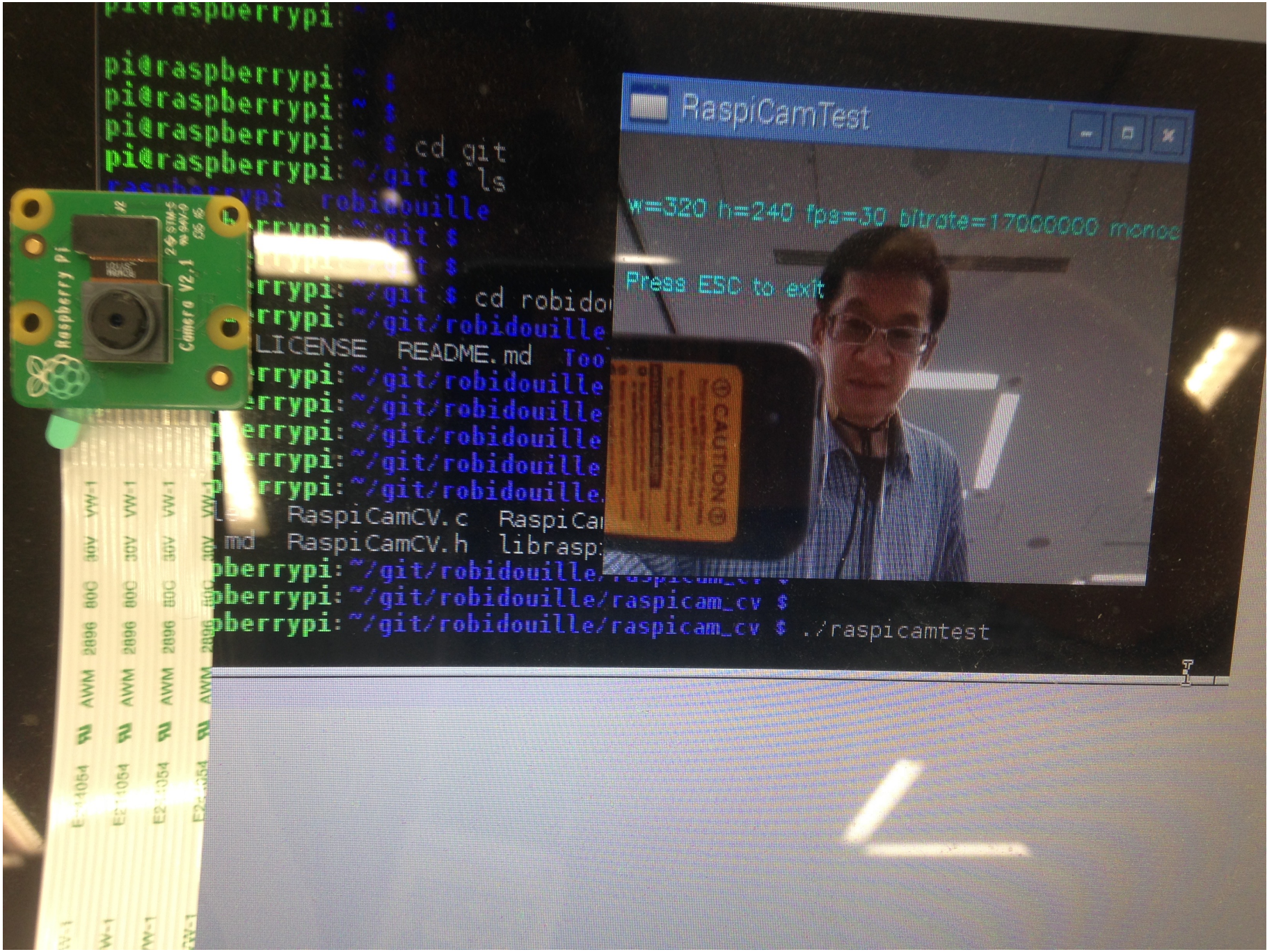
#./raspicamtest -l　→ 640 x 480 picture size

#./raspicamtest -x　→ 960 x 720 picture size

#./raspicamtest　　→ 320 x 240 picture size

Showing Performance Demo

5.How to use open CV for Raspberry Pi



Watching with display

Vnc, it’s better.
X11vnc is the best.

x11vnc command as follows

```
#x11vnc -usepw
```

How to use open CV program

```
#python [program files].py
#./  [Compiled program files]
```

6.Extras (What is this ?)

Compare face detect program

You can download

- webcamera
  https://gist.github.com/nikotan/1148913
  and so on
- pi camera

http://meganezumi.seesaa.net/article/427934982.html
and so on

Showing Performance Demo

But I’ve done them mostly. ^^;

7.Questions

Thank-you for all guys !