OpenCV安裝程序

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安裝相關套件

- 編譯套件
    - sudo apt-get install build-essential cmake
- 圖片套件
    - sudo apt-get install libjpeg-dev libpng-dev libtiff-dev
- 影片套件
    - sudo apt-get install libavcodec-dev libavformat-dev libswscale-dev libv4l-dev
    - sudo apt-get install libxvidcore-dev libx264-dev
- GTK套件
    - sudo apt-get install libgtk-3-dev libcanberra-gtk*
- 最佳化套件
    - sudo apt-get install libatlas-base-dev gfortran
- 樹莓派加裝
    - sudo apt-get install at-spi2-core

Python設定

- 安裝python3開發套件
  - sudo apt-get install python3-dev
- 安裝 virtualenv
  - sudo pip3 install virtualenv
- 建立並啟動 virtualenv
  - virtualenv -p python3 cv
  - cd cv
  - source bin/activate

紅字代表可以隨意命名

- 建立 virtualenv 後安裝 numpy 套件
  - pip install numpy （若不裝在 virtualenv 中需 sudo）

下載並解壓縮 OpenCV

- wget https://github.com/opencv/opencv/archive/master.zip
- wget https://github.com/opencv/opencv_contrib/archive/master.zip

設定編譯條件

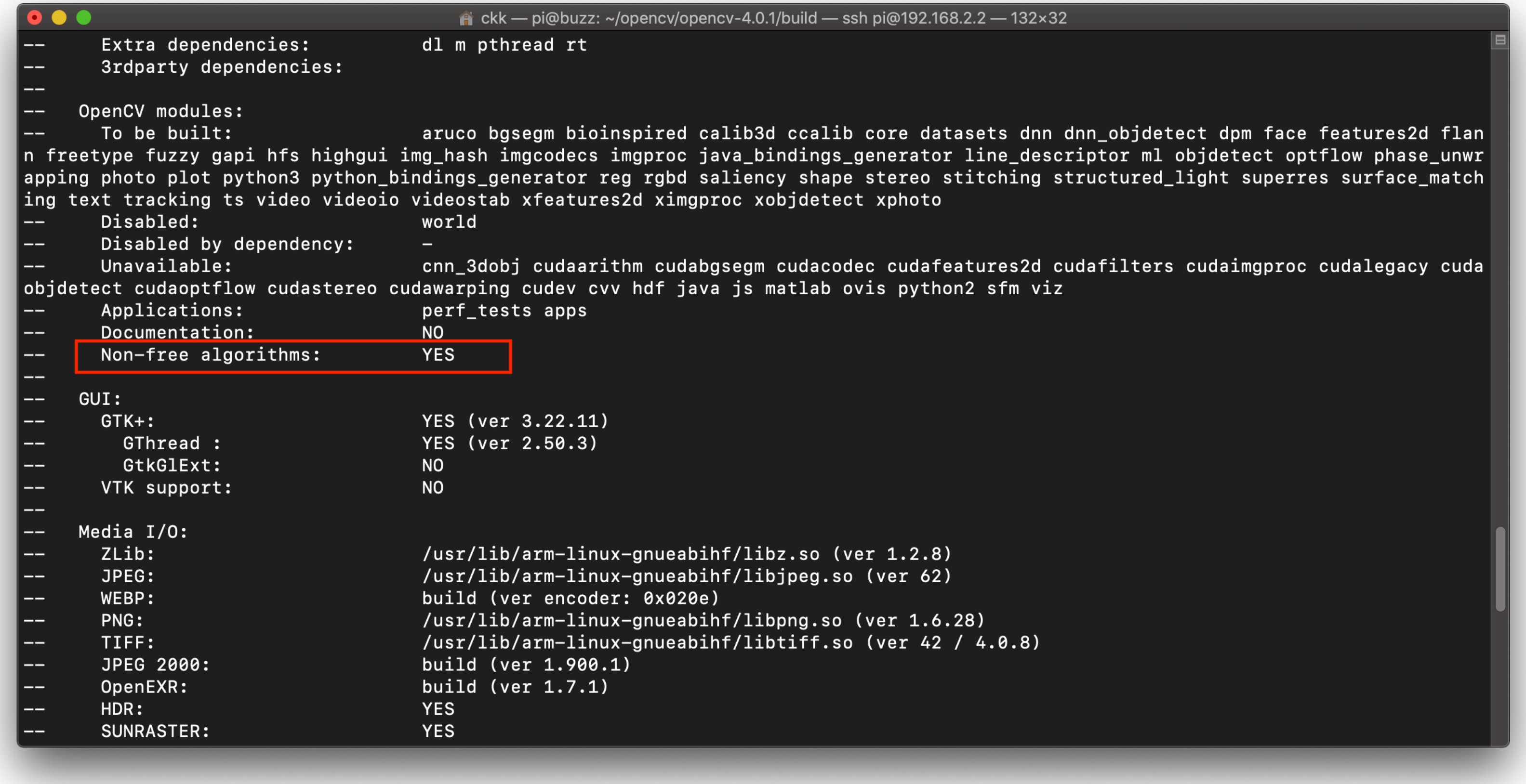
- 建立編譯目錄
  - cd opencv-master
  - mkdir build
  - cd build
- 修改 swapfile size
  - sudo vi /etc/dphys-swapfile
    - 修改 CONF_SWAPSIZE=2048
  - 改完後
    - sudo /etc/init.d/dphys-swapfile stop
    - sudo /etc/init.d/dphys-swapfile start

執行 cmake

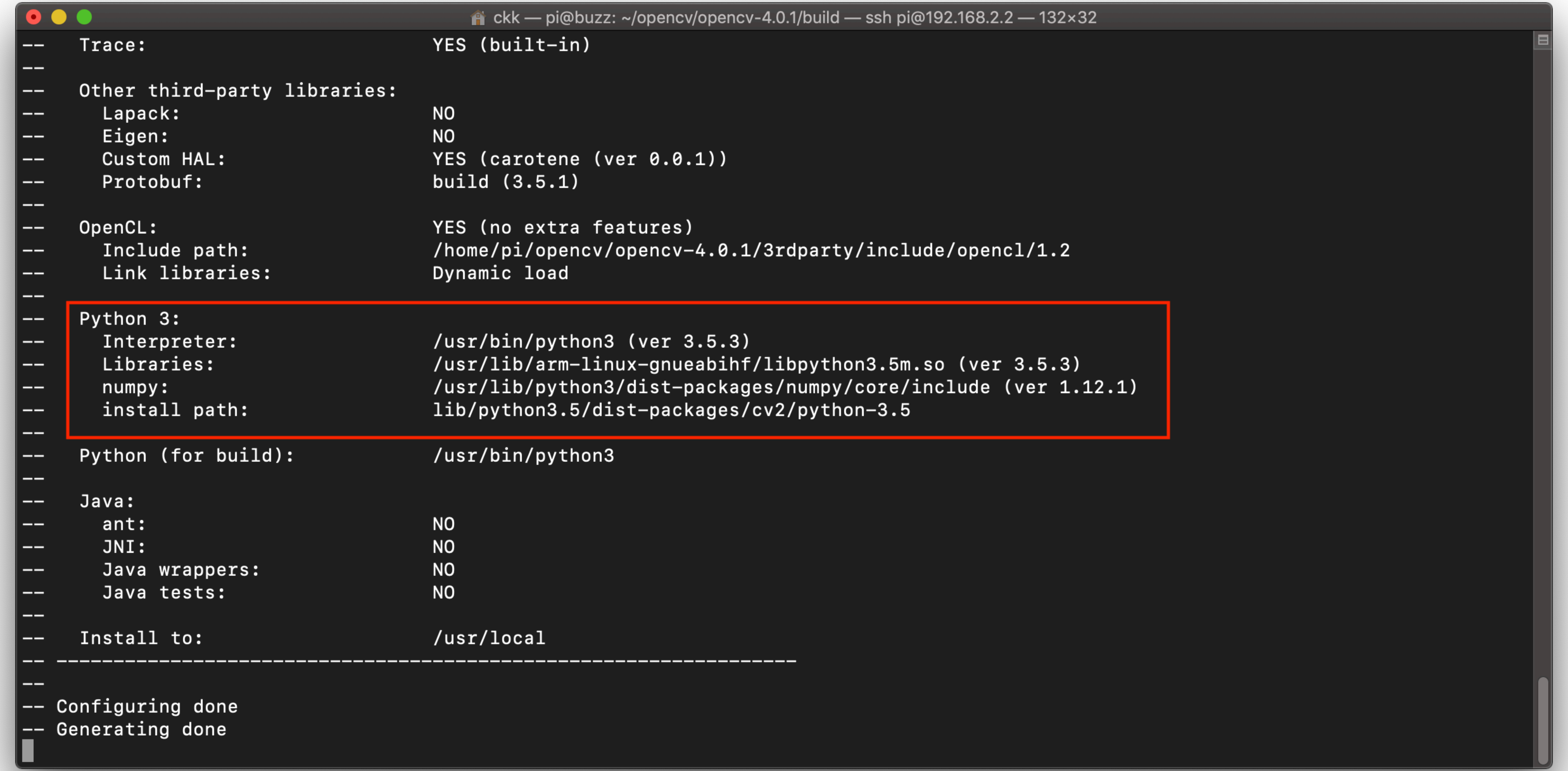
```
cmake -D CMAKE_BUILD_TYPE=RELEASE \
   -D CMAKE_INSTALL_PREFIX=/usr/local \
   -D OPENCV_EXTRA_MODULES_PATH=~/opencv/opencv_contrib-master/modules \
   -D ENABLE_NEON=ON \
   -D ENABLE_VFPV3=ON \
   -D BUILD_TESTS=OFF \
   -D OPENCV_ENABLE_NONFREE=ON \
   -D INSTALL_PYTHON_EXAMPLES=OFF \
   -D BUILD_EXAMPLES=OFF \
   -D PYTHON_EXECUTABLE=/usr/bin/python3 \
   ..
```

這兩個參數
zero 不可以下

檢查兩個地方是否正確


ckk — pi@buzz: ~/opencv/opencv-4.0.1/build — ssh pi@192.168.2.2 — 132×32

```
--     Extra dependencies:             dl m pthread rt
--     3rdparty dependencies:
--
--   OpenCV modules:
--     To be built:                    aruco bgsegm bioinspired calib3d ccalib core datasets dnn dnn_objdetect dpm face features2d flan
n freetype fuzzy gapi hfs highgui img_hash imgcodecs imgproc java_bindings_generator line_descriptor ml objdetect optflow phase_unwr
apping photo plot python3 python_bindings_generator reg rgbd saliency shape stereo stitching structured_light superres surface_match
ing text tracking ts video videoio videostab xfeatures2d ximgproc xobjdetect xphoto
--     Disabled:                       world
--     Disabled by dependency:         -
--     Unavailable:                    cnn_3dobj cudaarithm cudabgsegm cudacodec cudafeatures2d cudafilters cudaimgproc cudalegacy cuda
objdetect cudaoptflow cudastereo cudawarping cudev cvv hdf java js matlab ovis python2 sfm viz
--     Applications:                   perf_tests apps
--     Documentation:                  NO
--     Non-free algorithms:            YES
--
--   GUI:
--     GTK+:                           YES (ver 3.22.11)
--       GThread :                     YES (ver 2.50.3)
--       GtkGlExt:                     NO
--     VTK support:                    NO
--
--   Media I/O:
--     ZLib:                           /usr/lib/arm-linux-gnueabihf/libz.so (ver 1.2.8)
--     JPEG:                           /usr/lib/arm-linux-gnueabihf/libjpeg.so (ver 62)
--     WEBP:                           build (ver encoder: 0x020e)
--     PNG:                            /usr/lib/arm-linux-gnueabihf/libpng.so (ver 1.6.28)
--     TIFF:                           /usr/lib/arm-linux-gnueabihf/libtiff.so (ver 42 / 4.0.8)
--     JPEG 2000:                      build (ver 1.900.1)
--     OpenEXR:                        build (ver 1.7.1)
--     HDR:                            YES
--     SUNRASTER:                      YES
```



ckk — pi@buzz: ~/opencv/opencv-4.0.1/build — ssh pi@192.168.2.2 — 132×32

```
--   Trace:                         YES (built-in)
--
--   Other third-party libraries:
--     Lapack:                      NO
--     Eigen:                       NO
--     Custom HAL:                  YES (carotene (ver 0.0.1))
--     Protobuf:                    build (3.5.1)
--
--   OpenCL:                        YES (no extra features)
--     Include path:                /home/pi/opencv/opencv-4.0.1/3rdparty/include/opencl/1.2
--     Link libraries:              Dynamic load
--
--   Python 3:
--     Interpreter:                 /usr/bin/python3 (ver 3.5.3)
--     Libraries:                   /usr/lib/arm-linux-gnueabihf/libpython3.5m.so (ver 3.5.3)
--     numpy:                       /usr/lib/python3/dist-packages/numpy/core/include (ver 1.12.1)
--     install path:                lib/python3.5/dist-packages/cv2/python-3.5
--
--   Python (for build):            /usr/bin/python3
--
--   Java:
--     ant:                         NO
--     JNI:                         NO
--     Java wrappers:               NO
--     Java tests:                  NO
--
--   Install to:                    /usr/local
-- -----------------------------------------------------------------
--
-- Configuring done
-- Generating done
```

編譯

- 在 build 目錄下執行
    - make -j4
        - -j4 代表使用 4 核心 CPU 編譯，速度快。若是 8 核心 CPU，建議使用 -j8

- 編譯完成後執行（樹莓派3B+約 2 小時，zero 可以放上一整天）
    - sudo make install
    - sudo ldconfig
    - 將 swap size 改回 100

使用

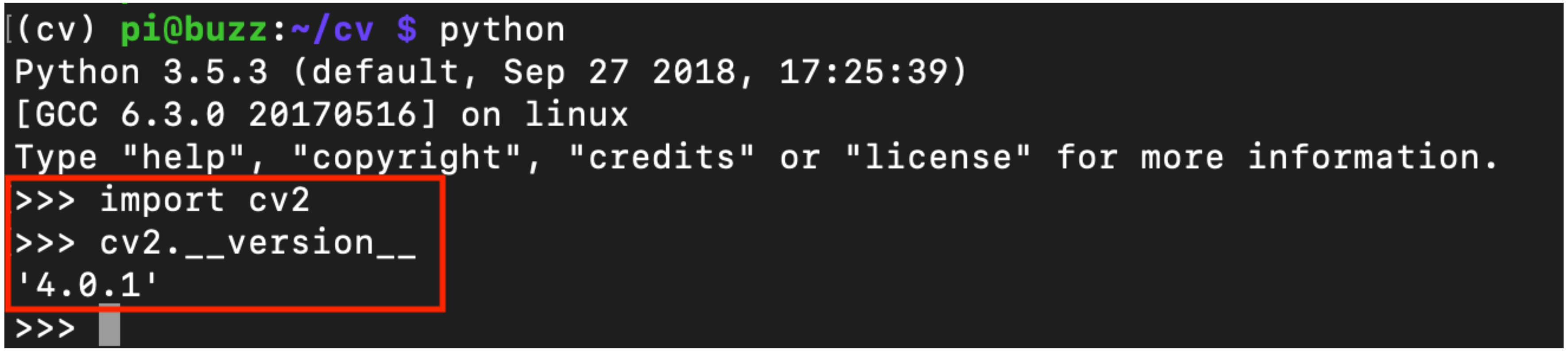
紅字代表可以隨意命名

- 建立虛擬環境
  - virtualenv -p python3 cv
  - cd cv
  - source bin/activate
- 安裝 numpy 套件
  - pip install numpy
- 設定 symbolic link
  - cd lib/python3.5/site-packages
  - ln -fs /usr/local/lib/python3.5/site-packages/cv2.cpython-35m-arm-linux-gnueabihf.so cv2.cpython-35m-arm-linux-gnueabihf.so

此處未空格者後果自付

測試

- 執行 python
- >>> import cv2
- 沒有錯誤訊息表示成功，恭喜（灑花啦）💐



```
[(cv) pi@buzz:~/cv $ 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.
>>> import cv2
>>> cv2.__version__
'4.0.1'
>>> 
```