컴퓨터 비전

OpenCV 설치

국민대학교 HCI Lab
최 정 우

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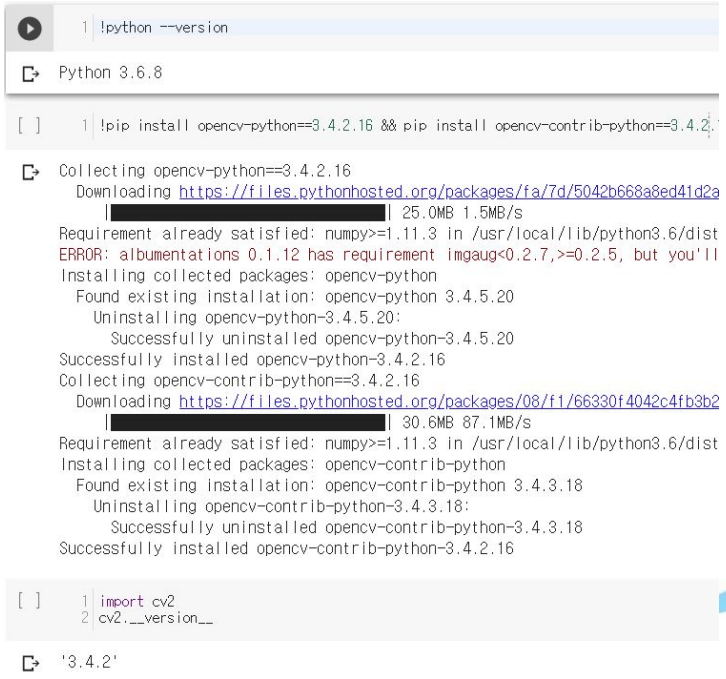
실습 환경

- Ubuntu 18.04.3 LTS
- OpenCV 3.4.2.16 + OpenCV contrib 3.4.2.16
  - 지정된 버전으로 설치
  - 업데이트된 버전 설치시 추후 실습에 문제 발생 가능
- Python 3.6.8 (기본설치)

OpenCV 설치

- Colab
  - !pip install opencv-python==3.4.2.16 && pip install opencv-contrib-python==3.4.2.16
  - 설치 상세 설명
    - http://bit.ly/2zHKnWi
  - 참고사항
    - cv2.imshow 동작 안됨, matplotlib를 이용하여 그림 출력



OpenCV 설치

- Ubuntu
  - pip 설치
    - $ sudo apt install python3-pip

```
nickname@ubuntu:~$ sudo apt install python3-pip
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
  build-essential dh-python dpkg-dev fakeroot g++ g++-7 gcc gcc-7 libalgorithm-diff-perl libalgorithm-d
  libasan4 libatomic1 libc-dev-bin libc6-dev libcilkrts5 libexpat1-dev libfakeroot libgcc-7-dev libitm1
  libpython3.6-dev libquadmath0 libstdc++-7-dev libtsan0 libubsan0 linux-libc-dev make manpages-dev pyt
  python3-setuptools python3-wheel python3.6-dev
Suggested packages:
  debian-keyring g++-multilib g++-7-multilib gcc-7-doc libstdc++6-7-dbg gcc-multilib autoconf automake
  gcc-7-locales libgcc1-dbg libgomp1-dbg libitm1-dbg libatomic1-dbg libasan4-dbg liblsan0-dbg libtsan0-
  libmpx2-dbg libquadmath0-dbg glibc-doc libstdc++-7-doc make-doc python-setuptools-doc
The following NEW packages will be installed:
  build-essential dh-python dpkg-dev fakeroot g++ g++-7 gcc gcc-7 libalgorithm-diff-perl libalgorithm-d
  libasan4 libatomic1 libc-dev-bin libc6-dev libcilkrts5 libexpat1-dev libfakeroot libgcc-7-dev libitm1
  libpython3.6-dev libquadmath0 libstdc++-7-dev libtsan0 libubsan0 linux-libc-dev make manpages-dev pyt
  python3-setuptools python3-wheel python3.6-dev
0 upgraded, 37 newly installed, 0 to remove and 3 not upgraded.
Need to get 74.5 MB of archives.
After this operation, 199 MB of additional disk space will be used.
Do you want to continue? [Y/n] y
```

OpenCV 설치

- Ubuntu
  - pip 로 OpenCV 설치
    - $ pip3 install opencv-python==3.4.2.16 && \

      pip3 install opencv-contrib-python==3.4.2.16

```
nickname@ubuntu:~$ pip3 install opencv-python==3.4.2.16 && pip3 install opencv-contrib-python==3.4.2.16
Collecting opencv-python==3.4.2.16
  Downloading https://files.pythonhosted.org/packages/fa/7d/5042b668a8ed41d2a80b8c172f5efcd572e3c046c75a
36-cp36m-manylinux1_x86_64.whl (25.0MB)
    100% |                                | 25.0MB 66kB/s
Collecting numpy>=1.11.3 (from opencv-python==3.4.2.16)
  Downloading https://files.pythonhosted.org/packages/75/92/57179ed45307ec6179e344231c47da7f3f3da9e2eee5
anylinux1_x86_64.whl (20.4MB)
    95% |                               | 19.5MB 12.7MB/s eta 0:00:01
```

OpenCV 빌드방법(3.1.0)

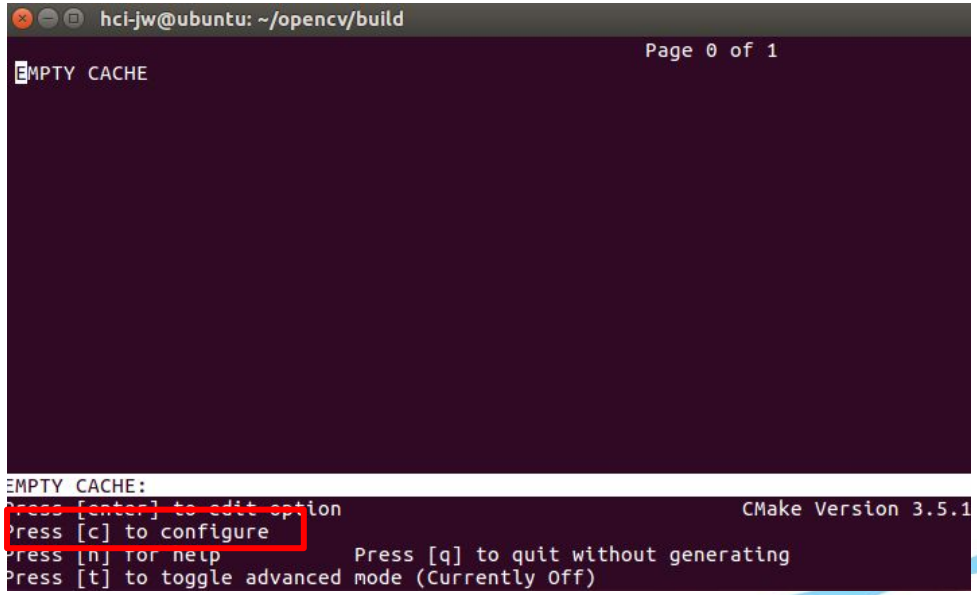
- Prerequisite
  - $ sudo apt-get install cmake git libgtk2.0-dev pkg-config libavcodec-dev libavformat-dev libswscale-dev
- OpenCV 3.1.0
  - $ git clone https://github.com/opencv/opencv.git
  - $ cd opencv
  - $ git checkout 3.1.0
- OpenCV 3.1.0 contrib
  - $ git clone https://github.com/opencv/opencv_contrib.git
  - $ cd opencv_contrib
  - $ git checkout 3.1.0
- ccmake
  - $ sudo apt-get install cmake-curses-gui

OpenCV contrib repository

- OpenCV 의 extra module 저장소
- Why
  - 새로운 모듈은 불안정적
  - 더많은 테스트 필요
  - License 문제

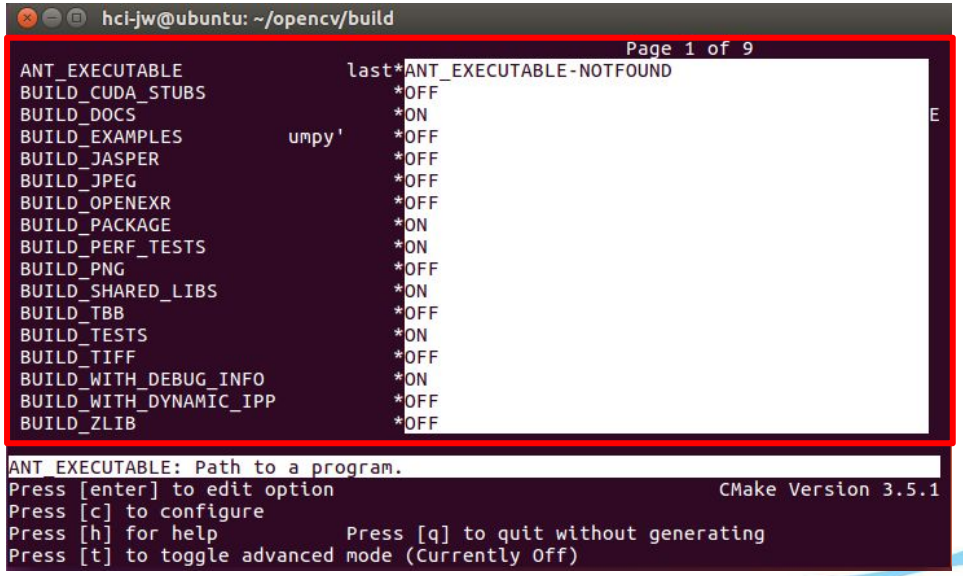
OpenCV 빌드방법(3.1.0)

- Opencv build with contrib
  - $ cd opencv
  - $ mkdir build && cd build
  - $ ccmake ..



OpenCV 빌드방법(3.1.0)

- Opencv build with contrib
  - c (configure)

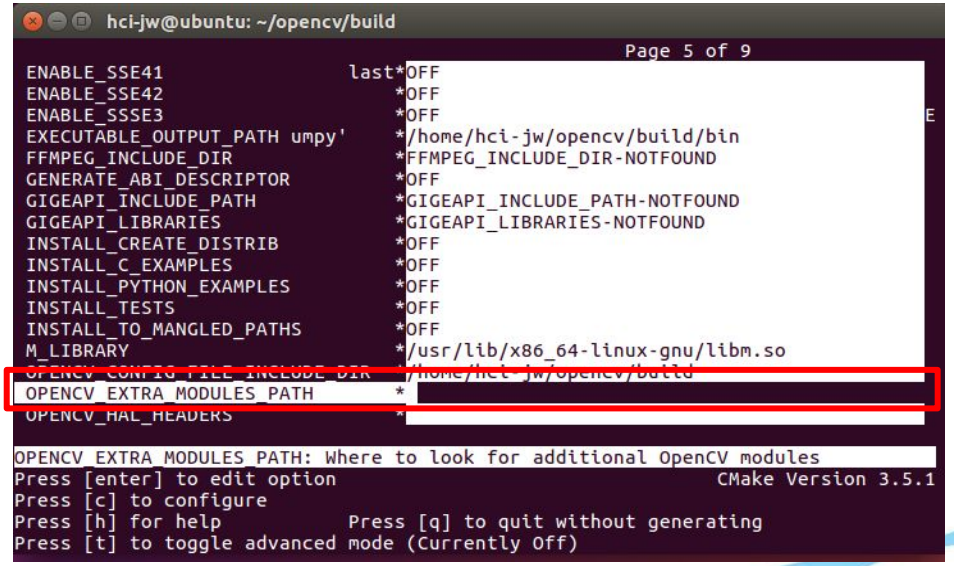


OpenCV 빌드방법(3.1.0)

- Opencv build with contrib
  - OPENCV_EXTRA_MODULES_PATH
  - opencv_contrib/modules의 경로 입력

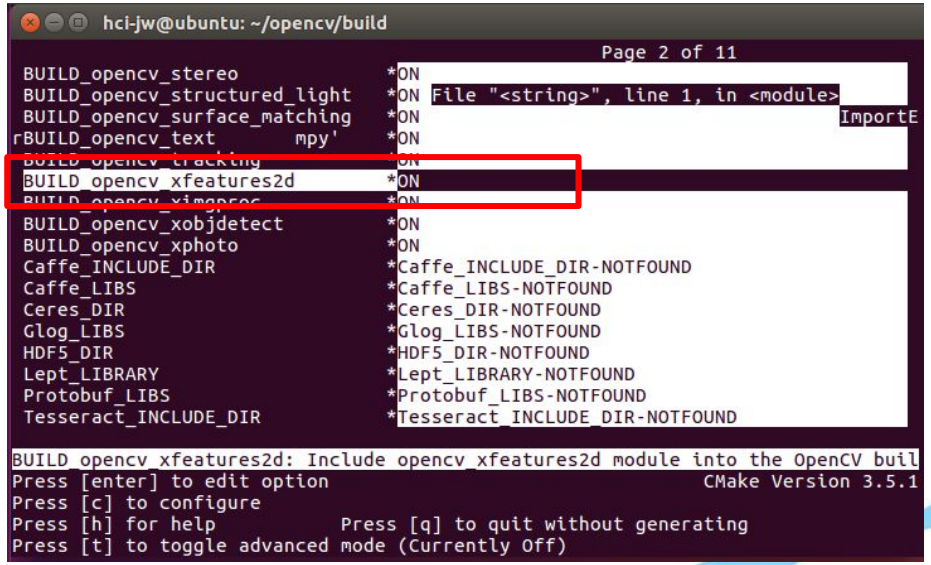
- eg: /home/hci-jw/opencv_contrib/modules

  - c (다시한번 configure)



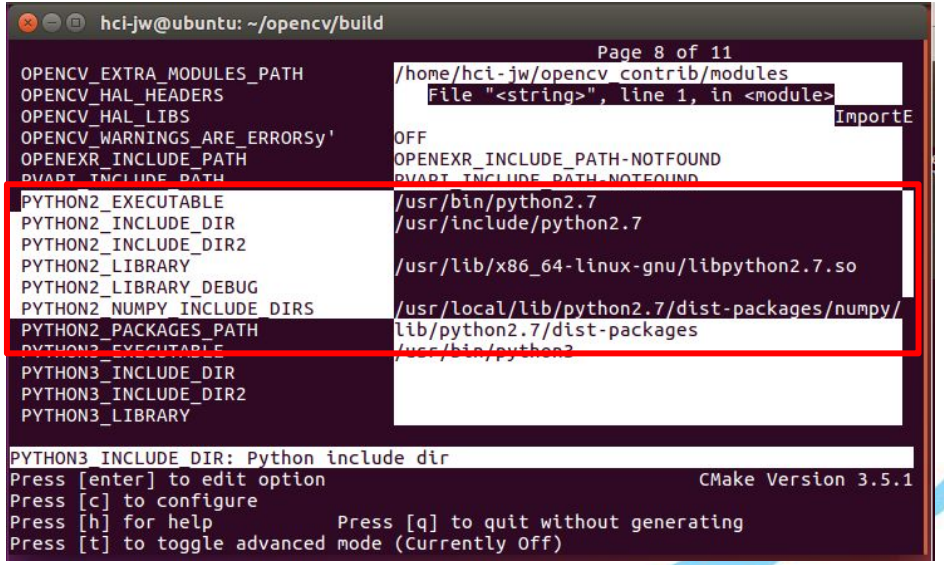
OpenCV 빌드방법(3.1.0)

- Opencv build with contrib
  - BUILD_opencv_xfeature2d ON 상태 확인
  - SIFT 알고리즘은 xfeature2d 안에 존재



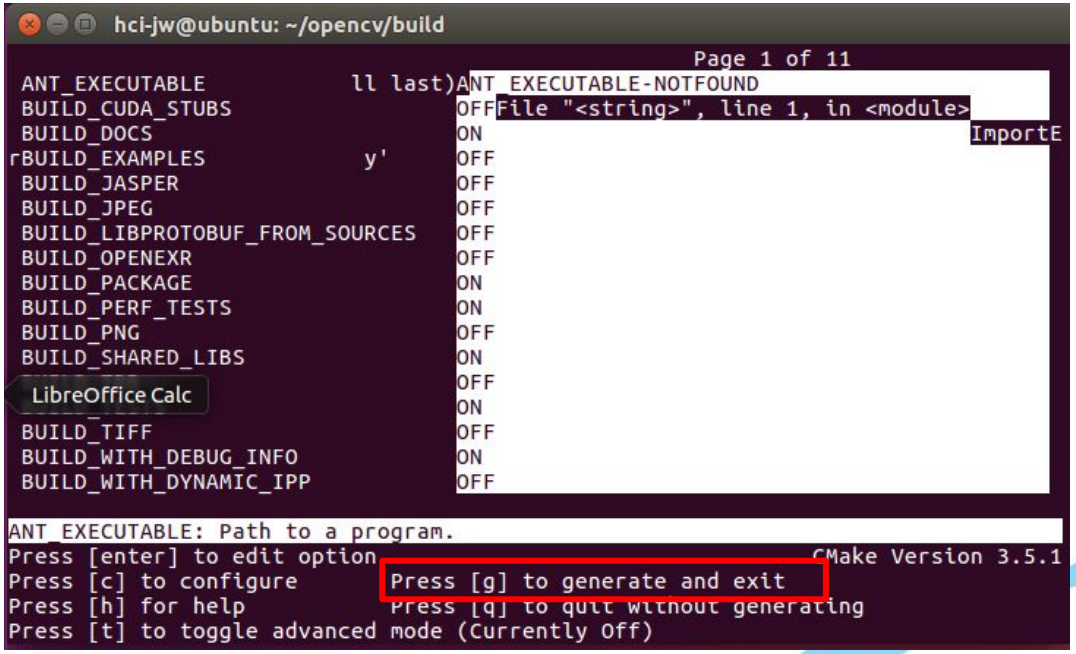
OpenCV 빌드방법(3.1.0)

- Opencv build for Python check
  - Python 관련 경로 확인
  - 이상이 없다면 c (configure) 다시



OpenCV 빌드방법(3.1.0)

- Generate Makefile
  - generate and exit 이 생김
  - g 눌러서 Makefile 생성



OpenCV 빌드방법(3.1.0)

- Build OpenCV
  - $ make -j4
  - $ sudo make install
  - $ sudo ldconfig

```
hci-jw@ubuntu:~/opencv/build$ make -j4
Scanning dependencies of target zlib
Scanning dependencies of target libwebp
Scanning dependencies of target libjpeg
Scanning dependencies of target libjasper
[  0%] Building C object 3rdparty/zlib/CMakeFiles/zlib.dir/adler32.c.o
[  0%] Building C object 3rdparty/libjasper/CMakeFiles/libjasper.dir/jas_stream.
c.o
[  0%] Building C object 3rdparty/libjpeg/CMakeFiles/libjpeg.dir/jutils.c.o
[  0%] Building C object 3rdparty/libwebp/CMakeFiles/libwebp.dir/dec/idec.c.o
[  0%] Building C object 3rdparty/libjpeg/CMakeFiles/libjpeg.dir/jddctmgr.c.o
[  0%] Building C object 3rdparty/zlib/CMakeFiles/zlib.dir/compress.c.o
[  0%] Building C object 3rdparty/zlib/CMakeFiles/zlib.dir/crc32.c.o
[  0%] Building C object 3rdparty/libwebp/CMakeFiles/libwebp.dir/dec/frame.c.o
[  0%] Building C object 3rdparty/libjpeg/CMakeFiles/libjpeg.dir/jccoefct.c.o
[  0%] Building C object 3rdparty/libjasper/CMakeFiles/libjasper.dir/jpc_cs.c.o
[  0%] Building C object 3rdparty/zlib/CMakeFiles/zlib.dir/deflate.c.o
[  0%] Building C object 3rdparty/libjpeg/CMakeFiles/libjpeg.dir/jfdctflt.c.o
[  0%] Building C object 3rdparty/libwebp/CMakeFiles/libwebp.dir/dec/tree.c.o
[  0%] Building C object 3rdparty/libjpeg/CMakeFiles/libjpeg.dir/jcdctmgr.c.o
[  0%] Building C object 3rdparty/libwebp/CMakeFiles/libwebp.dir/dec/quant.c.o
[  0%] Building C object 3rdparty/libjpeg/CMakeFiles/libjpeg.dir/jdmaster.c.o
[  0%] Building C object 3rdparty/libwebp/CMakeFiles/libwebp.dir/dec/buffer.c.o
```

OpenCV 빌드방법(3.1.0)

- Python check
  - $ python
  - >>> import cv2
  - >>> cv2.__version__

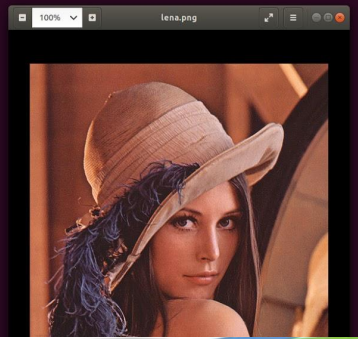
```
hci-jw@ubuntu:~/opencv/build$ python
Python 2.7.12 (default, Nov 19 2016, 06:48:10)
[GCC 5.4.0 20160609] on linux2
Type "help", "copyright", "credits" or "license" for more information.
>>> import cv2
>>> cv2.__version__
'3.1.0'
>>>
```

- Python-tk install (matplotlib)
  - sudo apt-get install python-tk

Test Code

- OpenCV를 이용한 이미지 출력
  - Eye of GNOME graphics viewer (eog)를 이용한 이미지 출력 예시

```
nickname@ubuntu:~/testcode$ wget https://docs.opencv.org/2.4/_images/lena.png
--2019-09-01 03:53:12--  https://docs.opencv.org/2.4/_images/lena.png
Resolving docs.opencv.org (docs.opencv.org)... 207.38.86.214, 2605:de00:1:1:4a:39:0:7
Connecting to docs.opencv.org (docs.opencv.org)|207.38.86.214|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 620636 (606K) [image/png]
Saving to: ‘lena.png’

lena.png                            100%[=================================================================>] 606.09K   467KB/s    in 1.3s

2019-09-01 03:53:14 (467 KB/s) - ‘lena.png’ saved [620636/620636]

nickname@ubuntu:~/testcode$ ls
lena.png
nickname@ubuntu:~/testcode$ eog lena.png
```



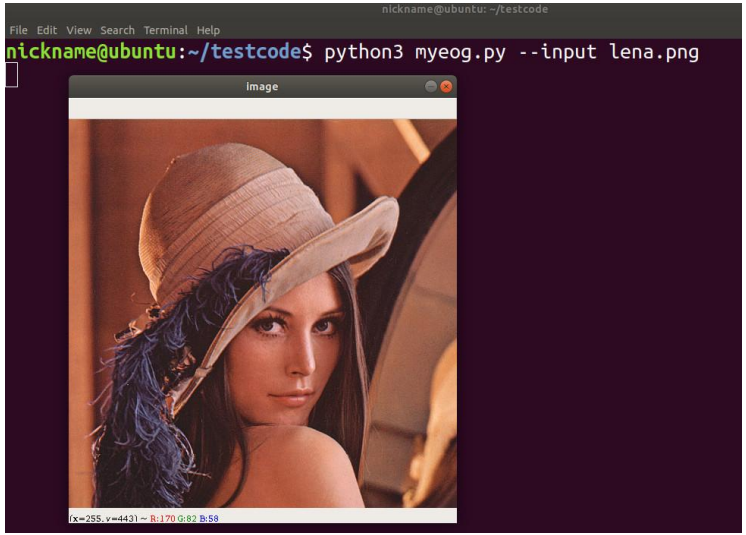
Test Code

- OpenCV를 이용한 이미지 출력
  - 이미지 다운로드
    - $ wget https://docs.opencv.org/2.4/_images/lena.png
  - 코드 작성 (pycharm, gedit, vim 등의 에디터이용)

```
import cv2
import argparse

parser = argparse.ArgumentParser()
parser.add_argument("--input", help="display this image", type=str)
args = parser.parse_args()

img = cv2.imread(args.input)

cv2.imshow("image", img)
cv2.waitKey(0)
cv2.destroyAllWindows()
```

Test Code

- OpenCV를 이용한 이미지 출력
  - 실행예시

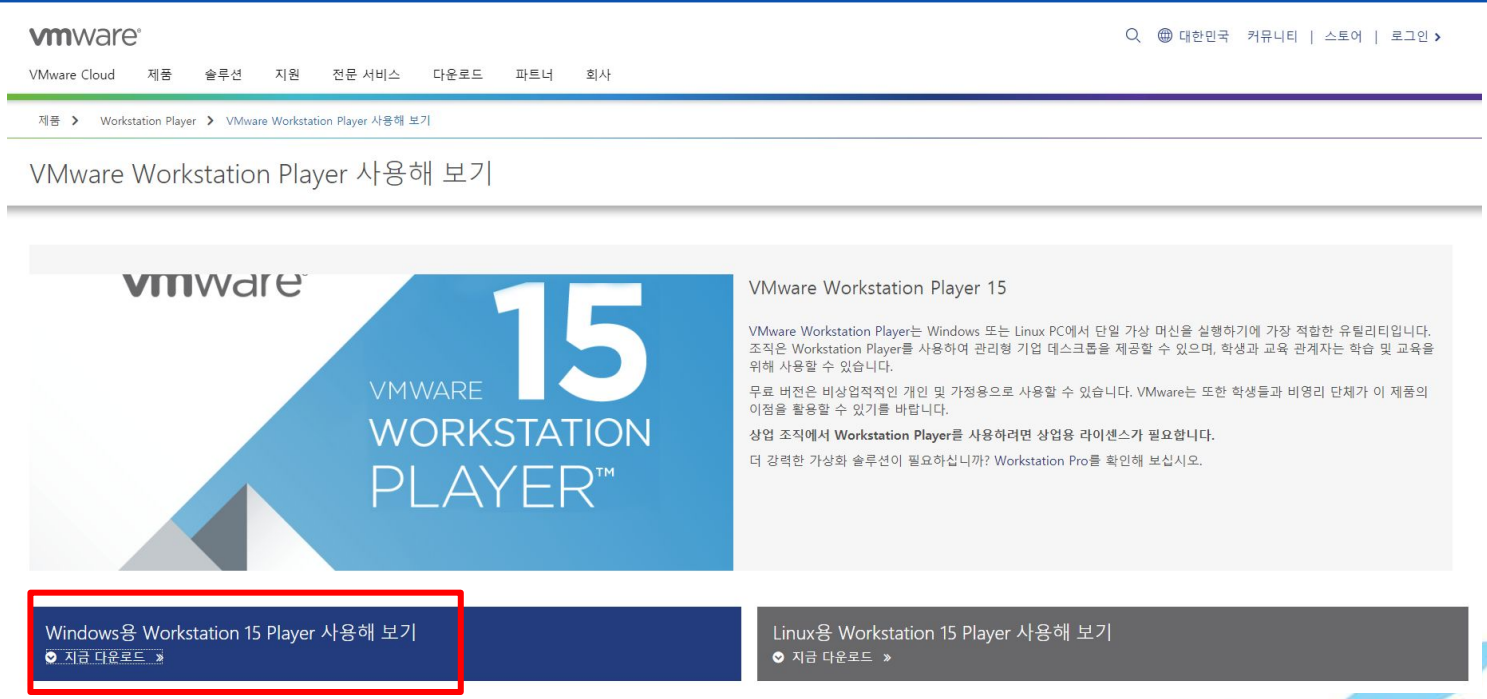


컴퓨터 비전

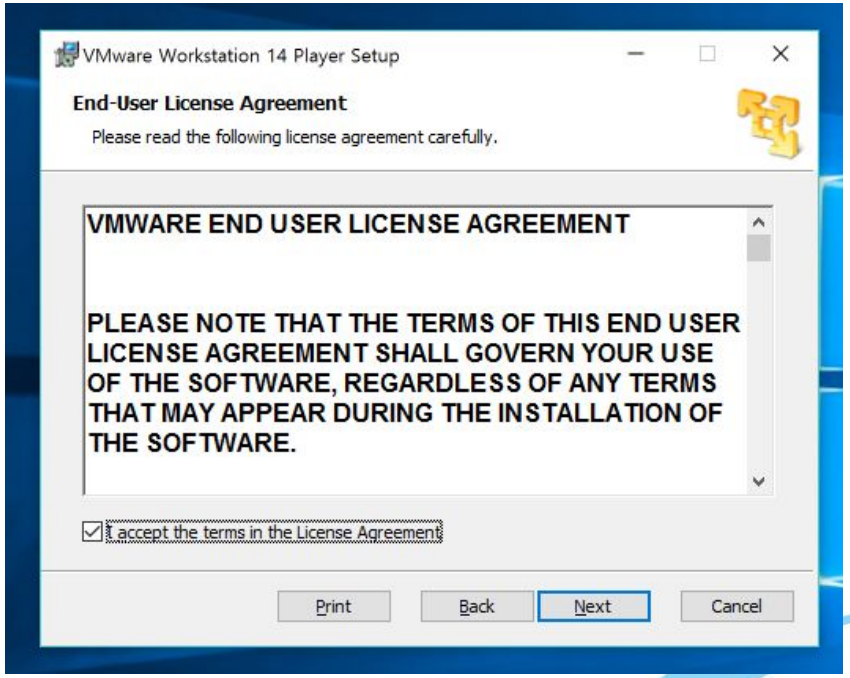
VMware 이용한 Ubuntu 설치

국민대학교 HCI Lab
최 정 우

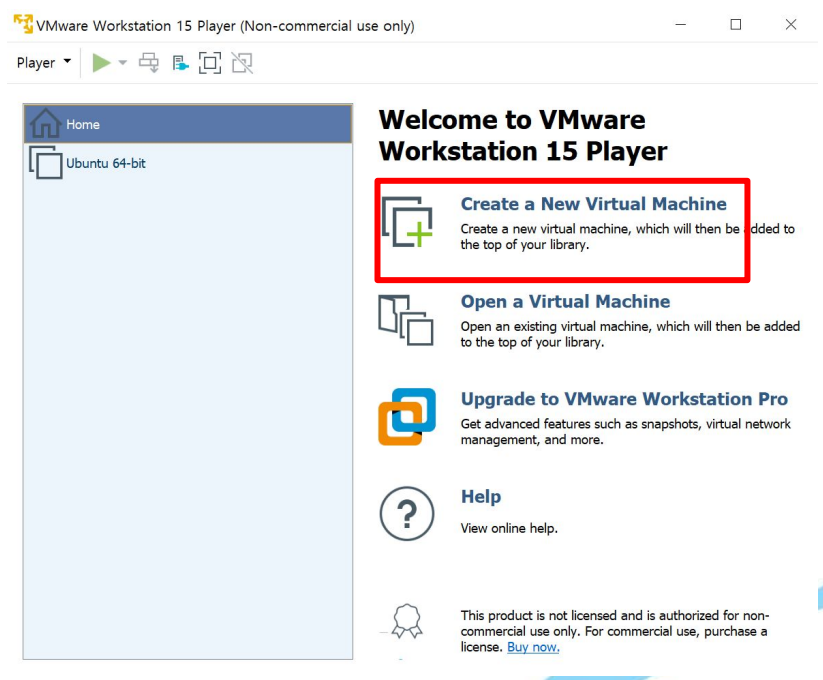
VMware Workstation Player



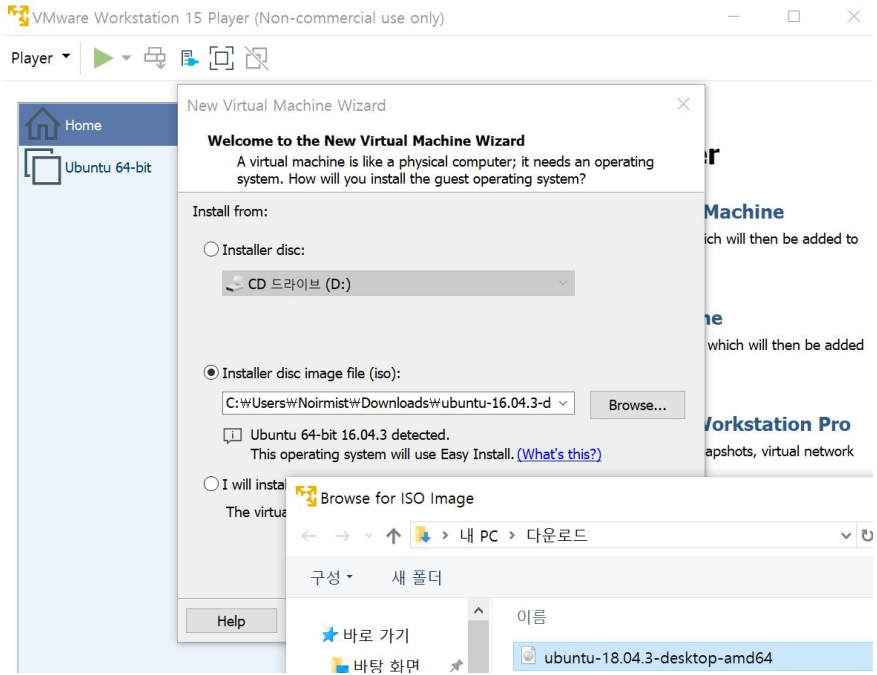
VMware Workstation Player

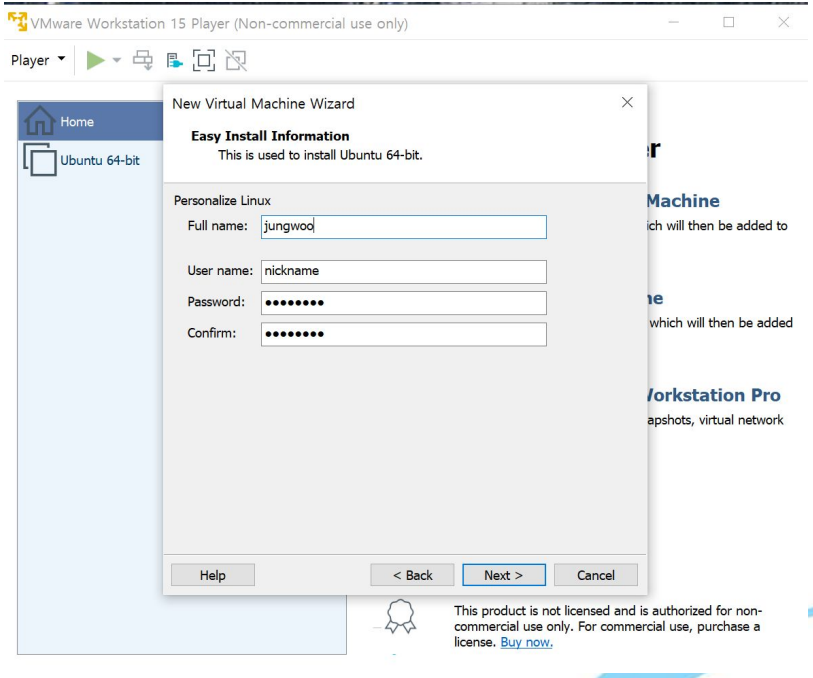


Install Ubuntu

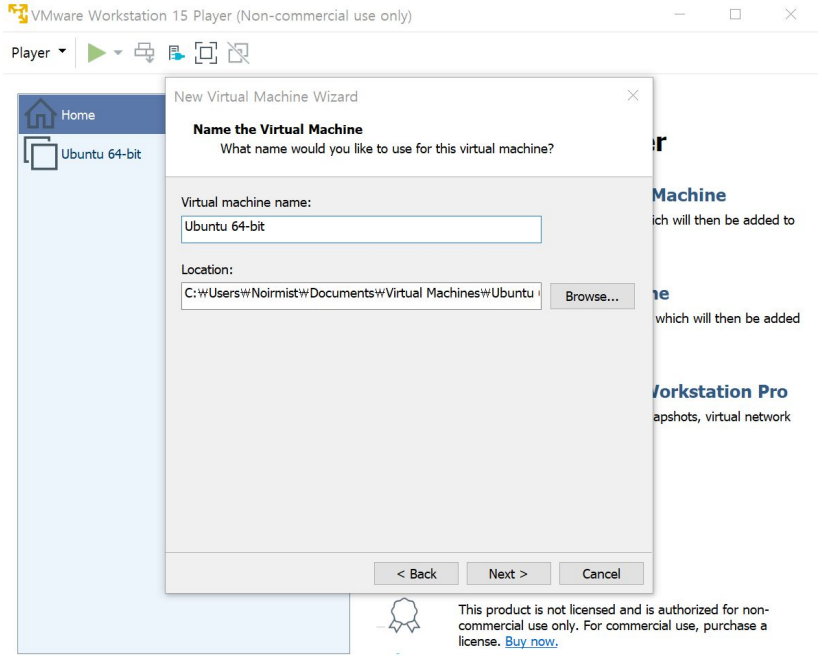


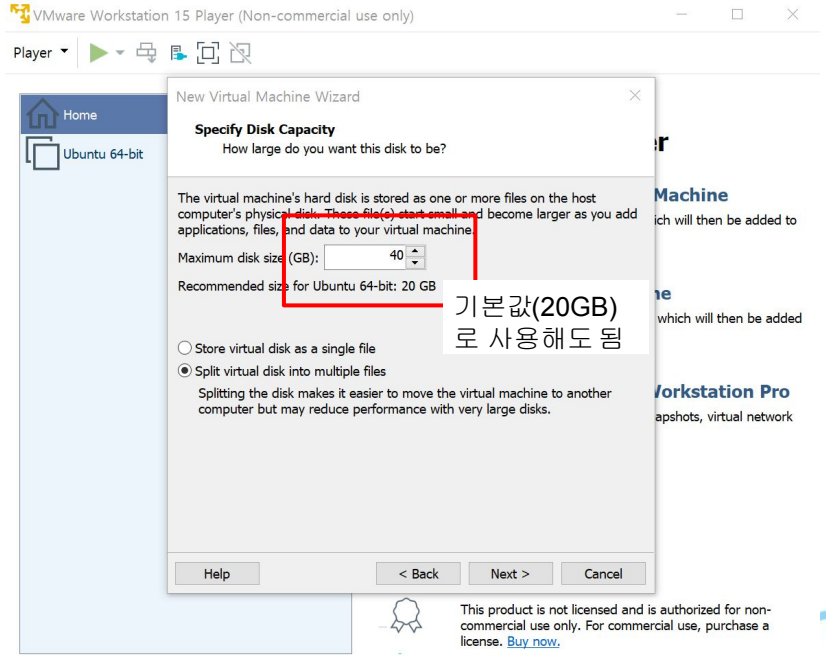
Install Ubuntu



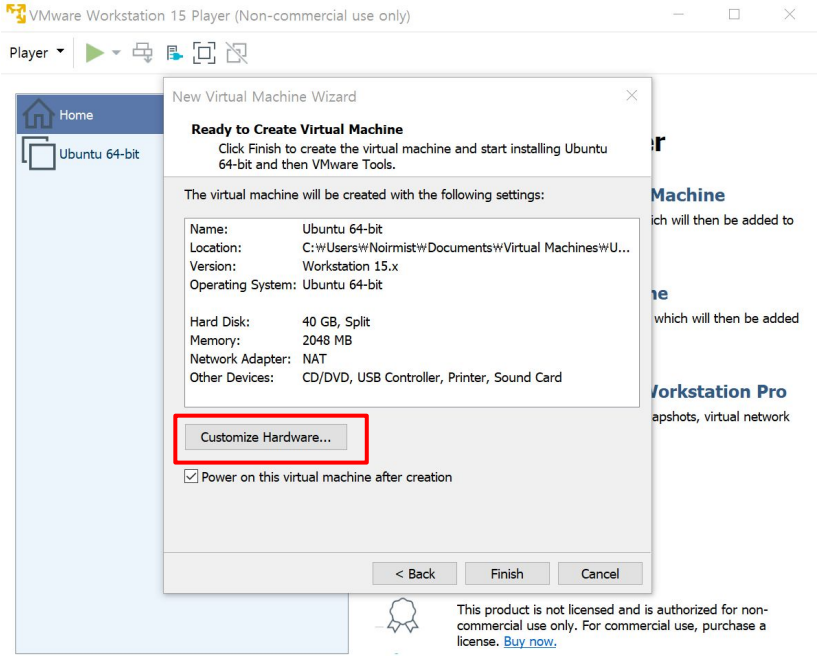


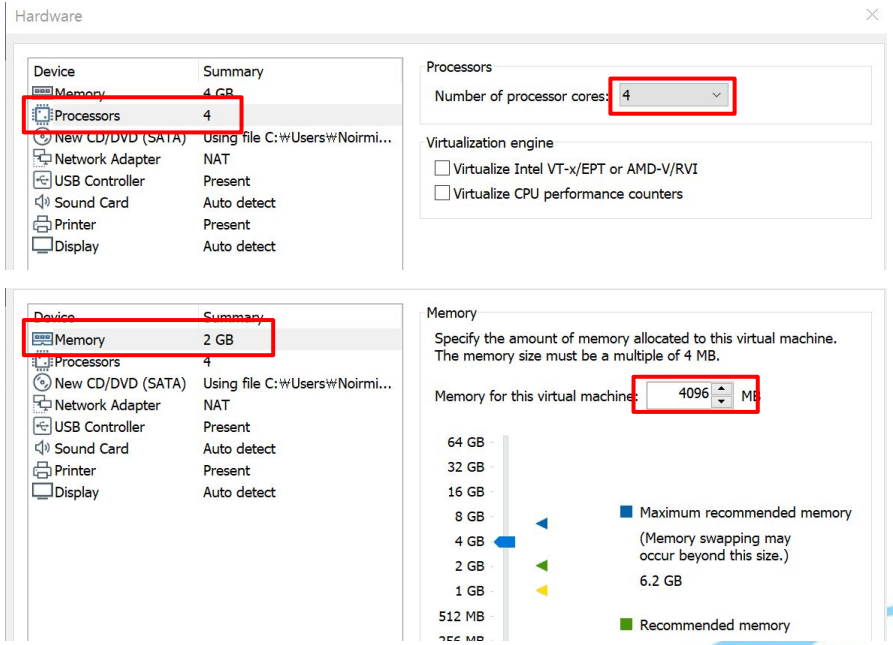
Install Ubuntu



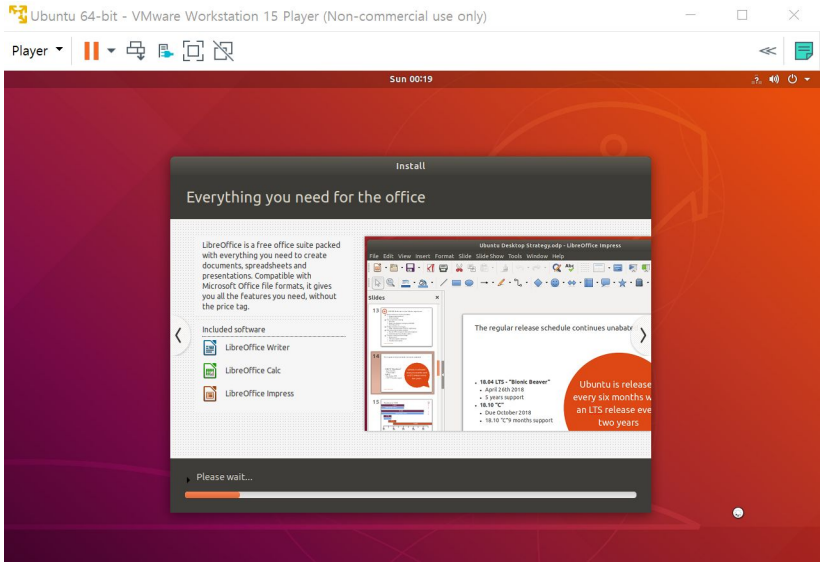


Install Ubuntu





Install Ubuntu



설치 완료 까지 15분에서 20분정도 소요됨
(소요시간은 컴퓨터의 성능에 따라서 다를 수 있음)

E-mail & HCI lab 위치

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- 메일로 연락후 방문