Brain AI

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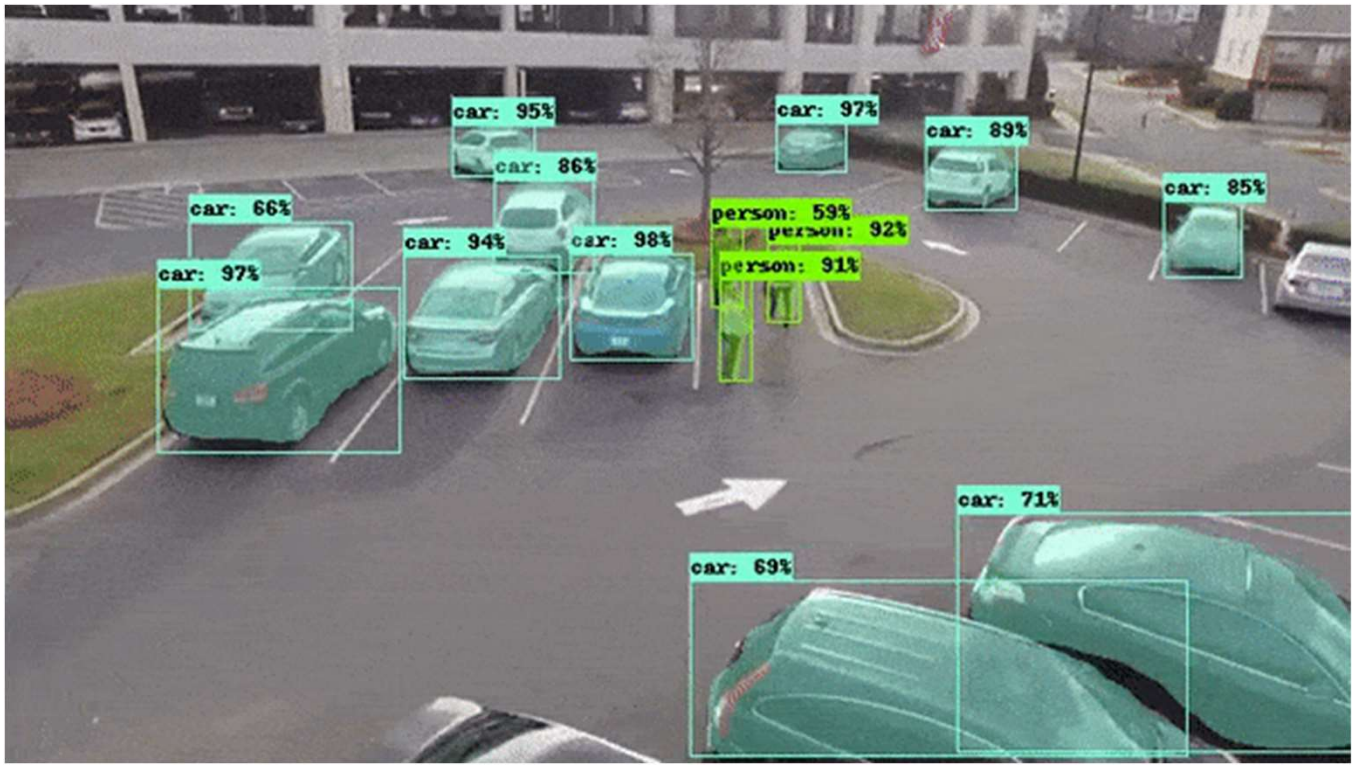
사전과제3. Intel OpenVINO

설치 및 테스트

컴퓨터비전

컴퓨터 비전 실생활 활용



Source: https://towardsdatascience.com/how-to-do-everything-in-computer-vision-2b442c469928

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컴퓨터비전 적용 사례(기계)

Source: https://www.youtube.com/watch?v=rVlhMGQgDkY

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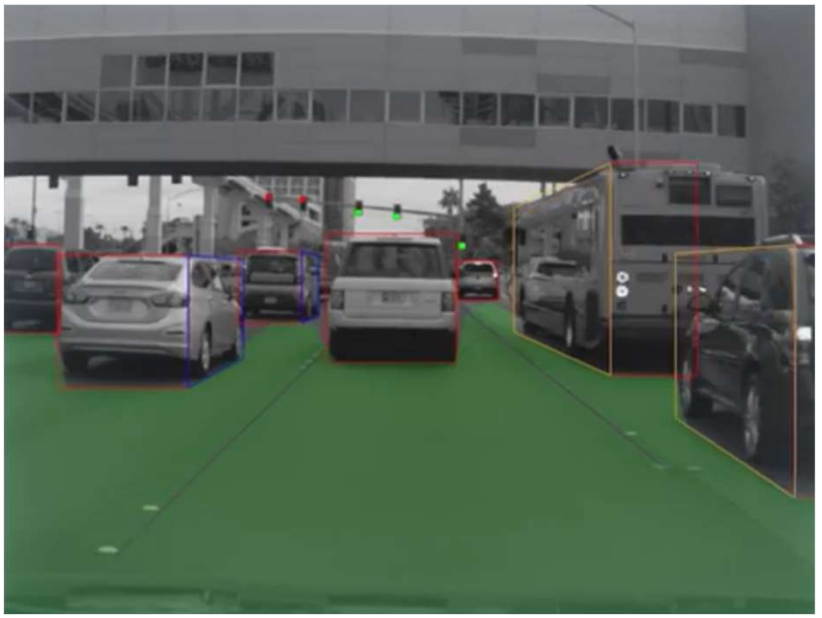
컴퓨터비전 적용 사례(전자)

Source: https://www.youtube.com/watch?v=vL_QNy25n74



Source: https://www.youtube.com/watch?v=mgjosWaYDWY

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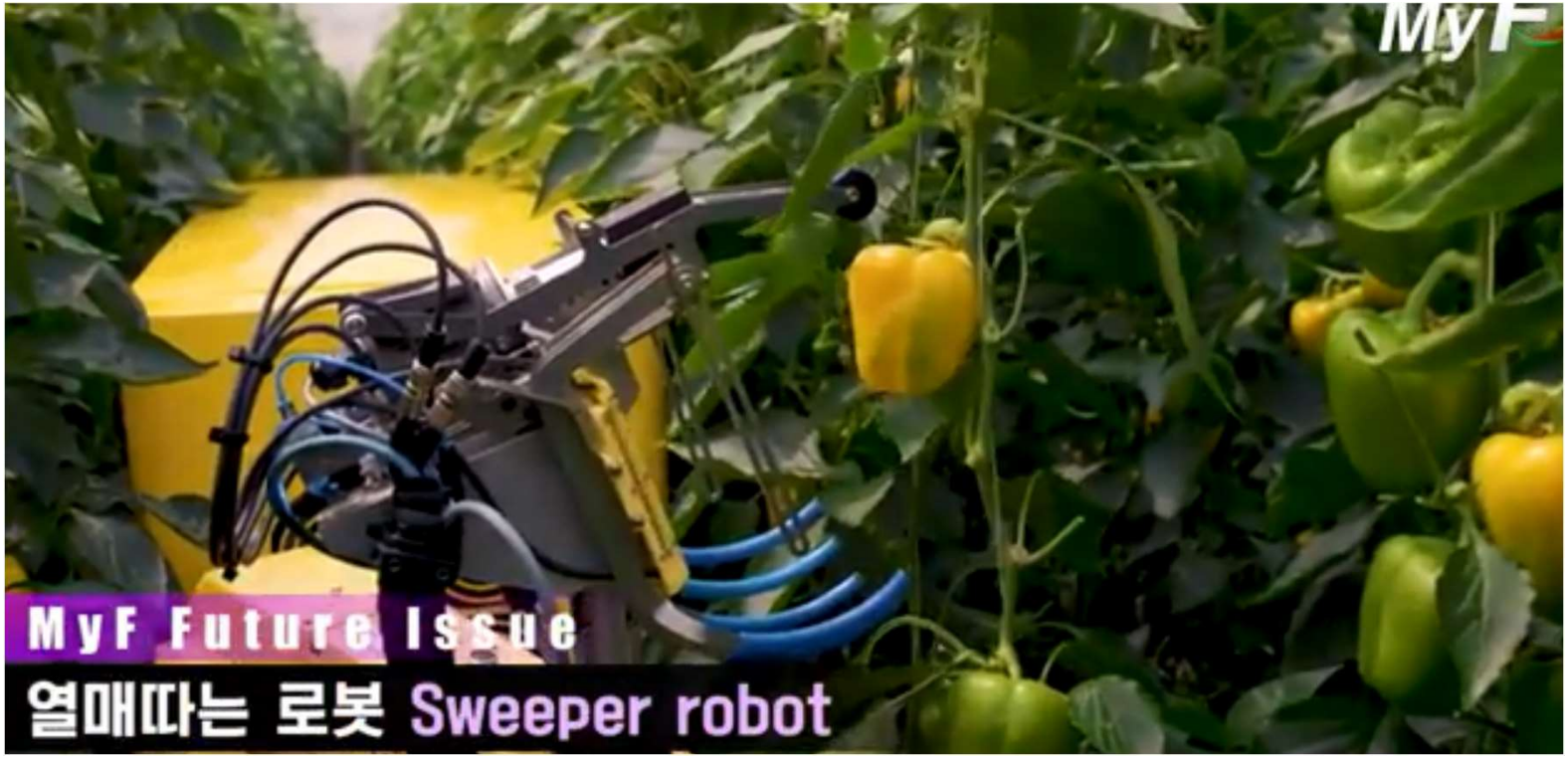
컴퓨터비전 적용 사례(농업)



Source: https://www.youtube.com/watch?v=4szyNJjv-fo

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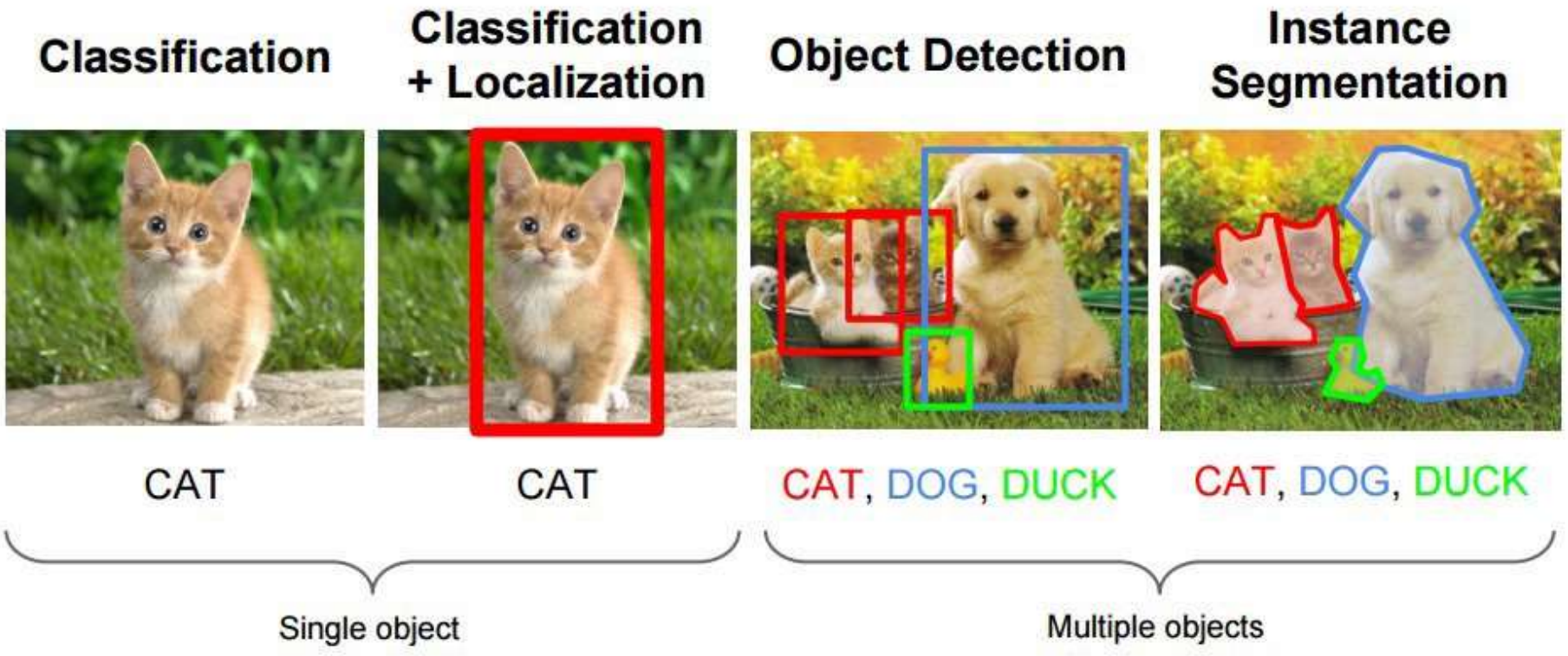
컴퓨터비전 적용 사례(상업)

Source: https://www.youtube.com/watch?v=us9HiG-suKI

컴퓨터비전 적용 사례(상업)

Source: https://www.youtube.com/watch?v=k4P2ybwn1iM

Computer Vision Tasks



Source: http://cs231n.stanford.edu/ Credit For The Image Goes To: Mike Tamir

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Open CV

OpenCV

- **Open Source Computer Vision의 약자로 영상 처리에 사용할 수 있는 오픈 소스 라이브러리**
- **실시간 컴퓨터 비전을 목적으로 한 프로그래밍 라이브러리**
- **영상 데이터의 표현, 변환, 분석 등에 필요한 도구들을 제공**
- **사물인식, 안면인식, 제스처 인식 등의 응용을 대상**

Brain AI

OpenCV 실습

1. OpenCV 라이브러리 불러오기

In [2]:
```
import cv2
import numpy as np
import sys
```

OpenCV 실습

2. 이미지 불러오기

In [5]:
```
img = cv2.imread("student-group.jpg")
cv2.imshow("image", img)

cv2.waitKey(0)
cv2.destroyAllWindows()
```

OpenCV 실습

In [15]:
```
from matplotlib import pyplot as plt

img = cv2.imread("student-group.jpg")

plt.imshow(img)
plt.title('Brain AI Lab')
plt.axis('on')
plt.show()
```

OpenCV 실습

In [17]:
```
rgb = cv2.cvtColor(img, cv2.COLOR_BGR2RGB)
plt.imshow(rgb)
plt.title('Brain AI Lab')
plt.axis('on')
plt.show()
```

OpenCV 실습

In [21]:
```
grey = cv2.cvtColor(img, cv2.COLOR_BGR2GRAY)
plt.imshow(grey)
plt.title('Brain AI Lab')
plt.axis('off')
plt.show()
```

OpenCV 실습

In [2]:
```
capture = cv2.VideoCapture(0)
```

In [3]:
```
while True:
    ret, frame = capture.read()
    cv2.imshow('WebCam', frame)
    k = cv2.waitKey(10) & 0xFF
    if k == 27:
        break

capture.release()
cv2.destroyAllWindows()
```

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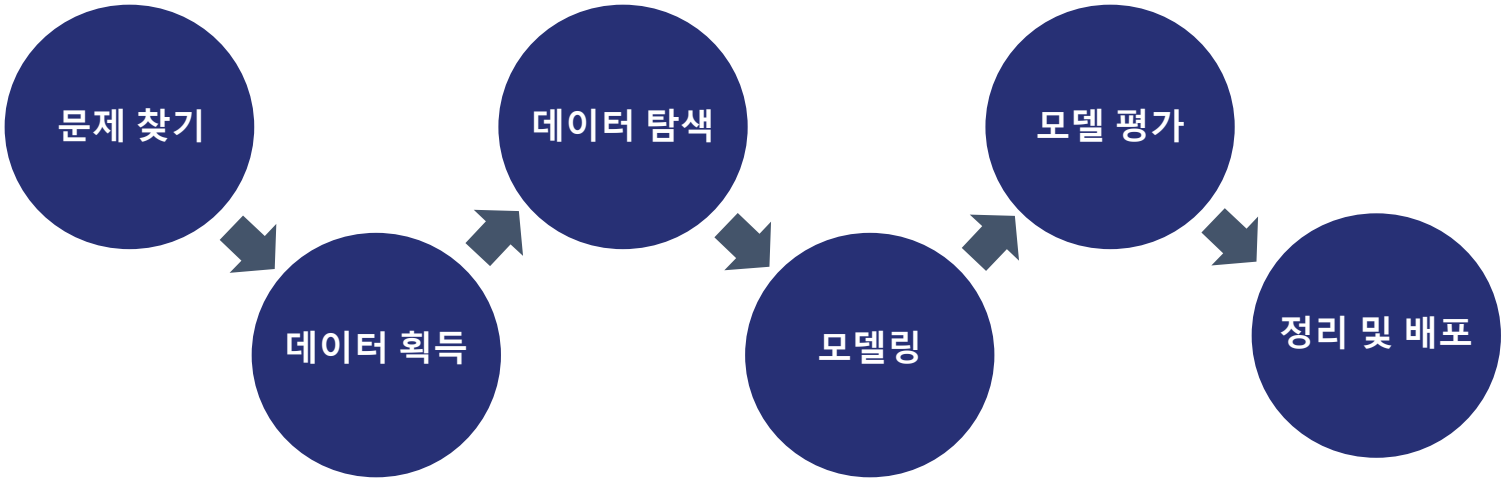
OpenVINO Pre-trained Model

인텔 AI 프로젝트 사이클



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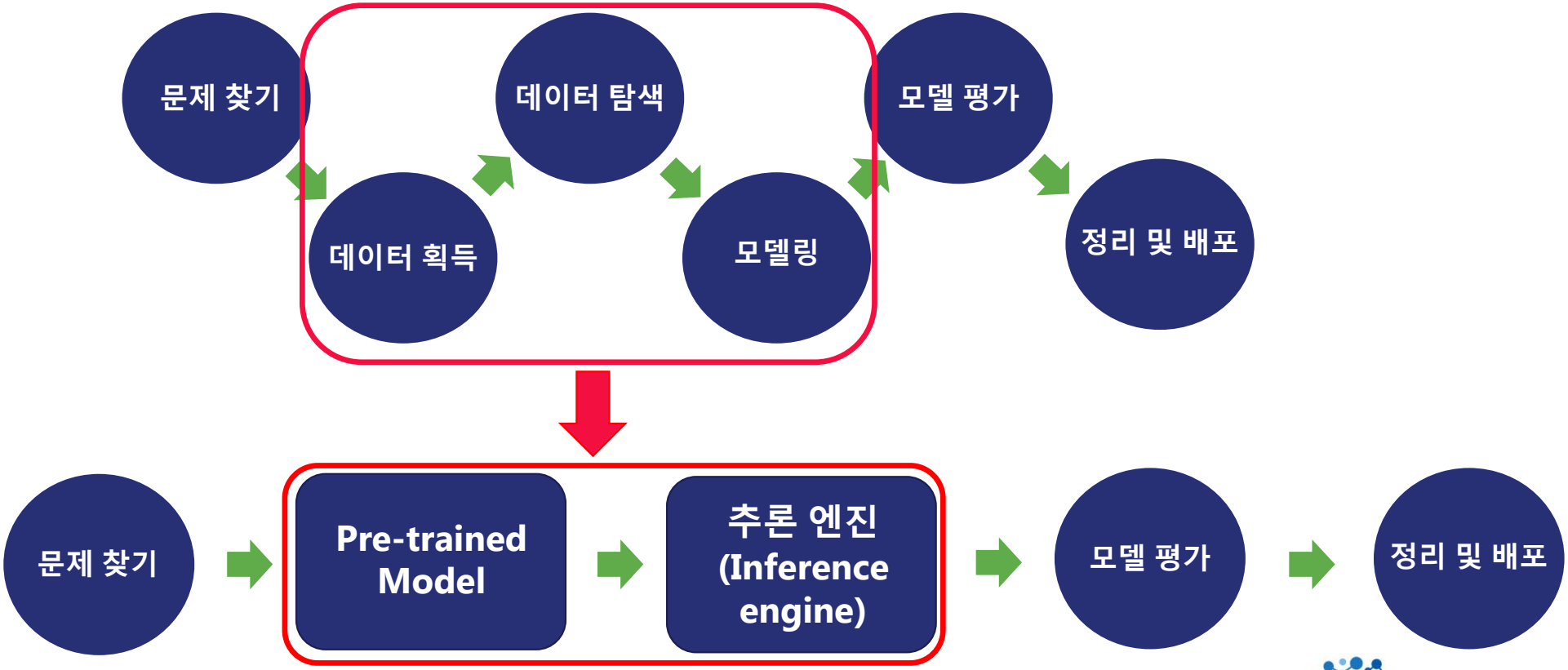
Pre-Trained Model

- training을 끝낸 이후에 산출물로 나온 모델

- 데이터 획득, 데이터 탐색, 데이터 모델링이 필요 없음.

인텔 AI 프로젝트 사이클



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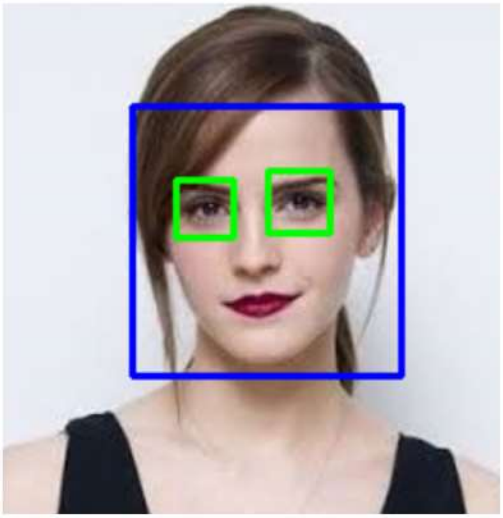
Pre-Trained Model



Source : https://medium.com/dataseries/face-recognition-with-opencv-haar-cascade-a289b6ff042a

Worksheet – 3 : OpenVINO Pre-Trained Model

필수: https://github.com/simpledevelopments/OpenVINO-Python-Utils

Pre-Trained Model

Intel® Distribution of OpenVINO™

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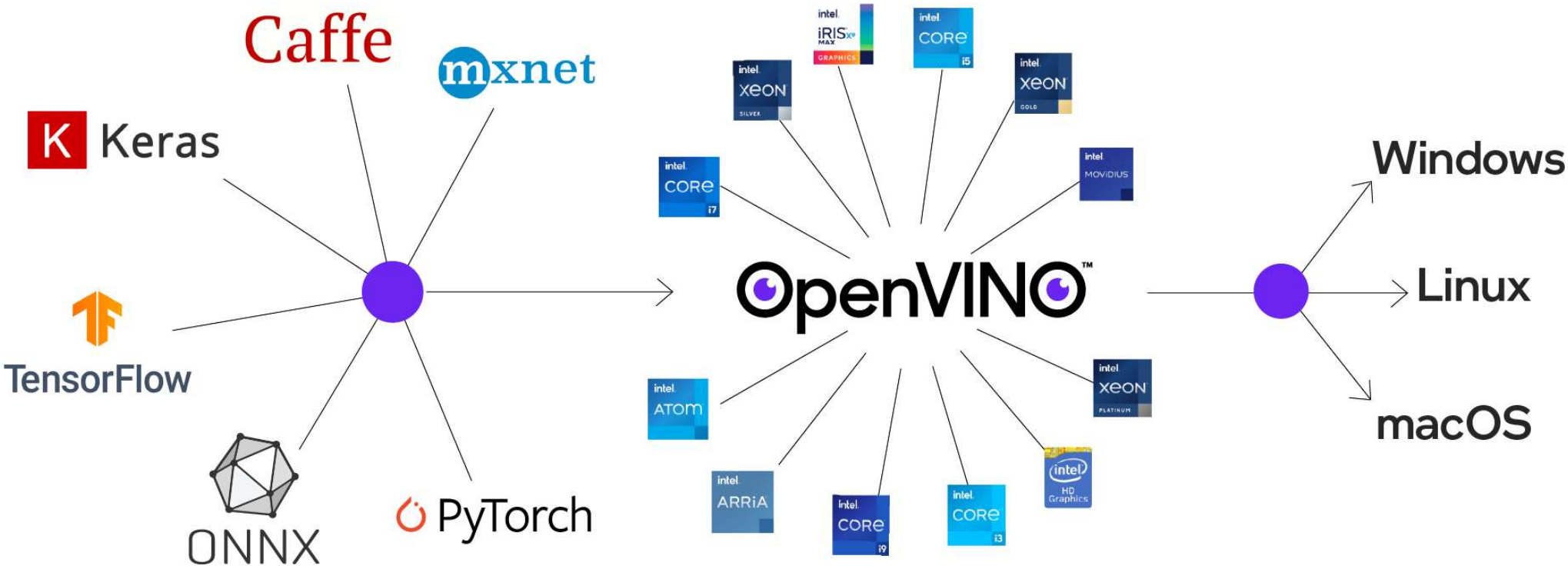
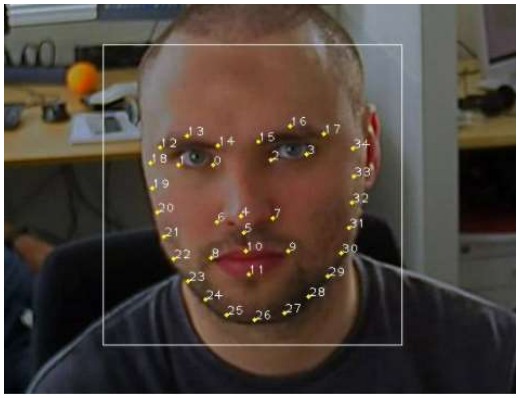
Pre-Trained Model



OpenVINO™ 에서 제공하는 Model Zoo

- **얼굴 인식(Face Detection)**



● **얼굴 랜드 마크 감지(Facial Landmarks Detection)**

이것은 컨볼루션 신경망을 기반으로 하는 사용자 지정 아키텍처입니다.
눈, 코, 입, 눈썹 및 얼굴 윤곽을 덮는 35 개의 얼굴 랜드 마크를 감지합니다.

● **가벼운 얼굴 랜드 마크 감지(Lightweight Facial Landmarks Detection)**

이 경량 회귀 모델은 두 개의 눈, 코, 두 개의 입술 모서리 등 5 개의 얼굴 랜드 마크를 식별합니다. 이 모델은 스마트 교실 사용 사례에 가장 적합합니다.

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OpenVINO jupyter notebook에서 사용하기

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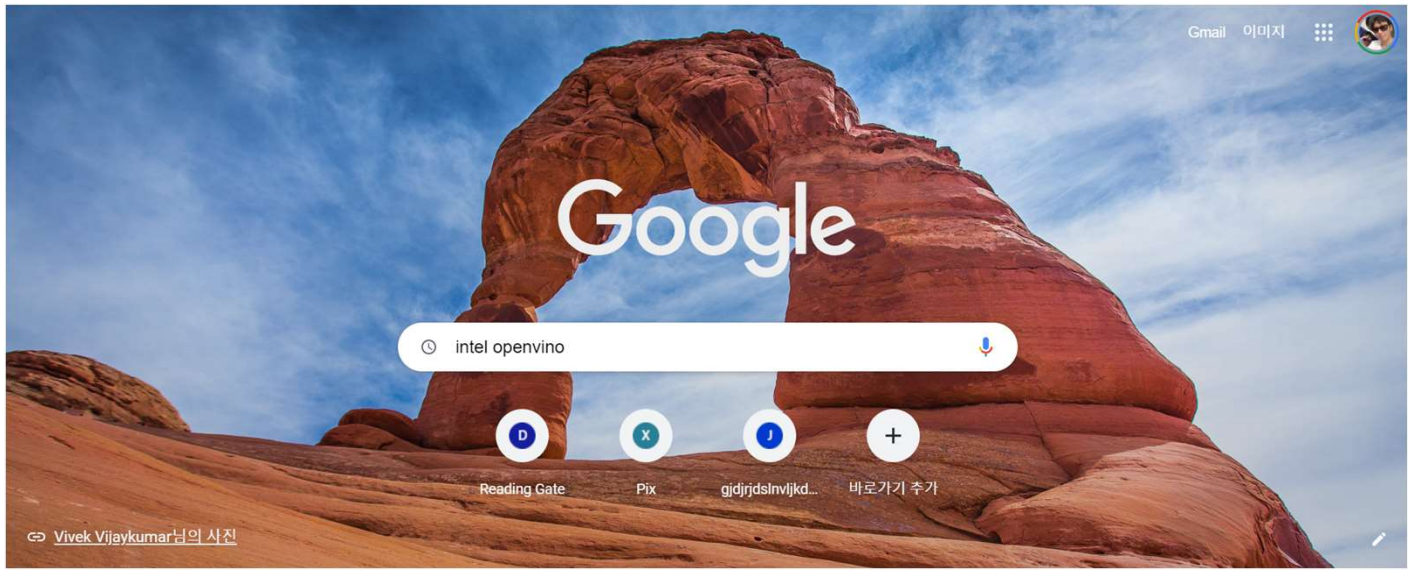
OpenVINO 다운로드 및 설치

OpenVINO™ 설치

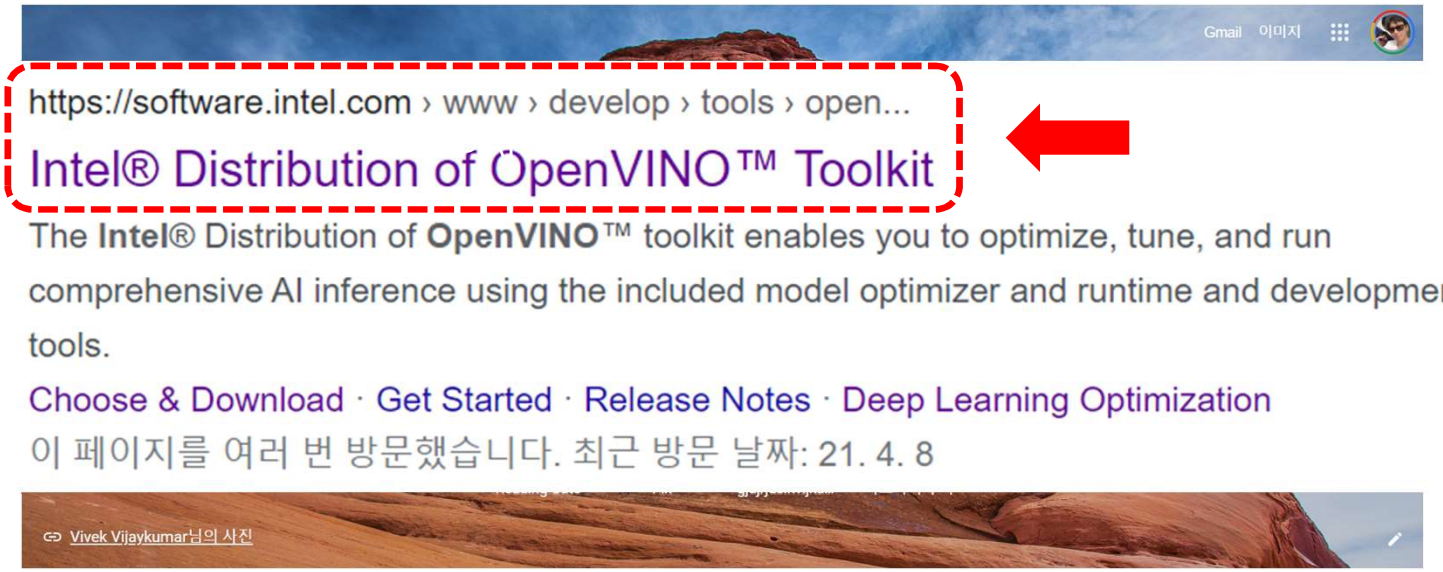
"Intel OpenVINO" 검색



Brain AI

OpenVINO™ 설치

"Intel OpenVINO" 검색



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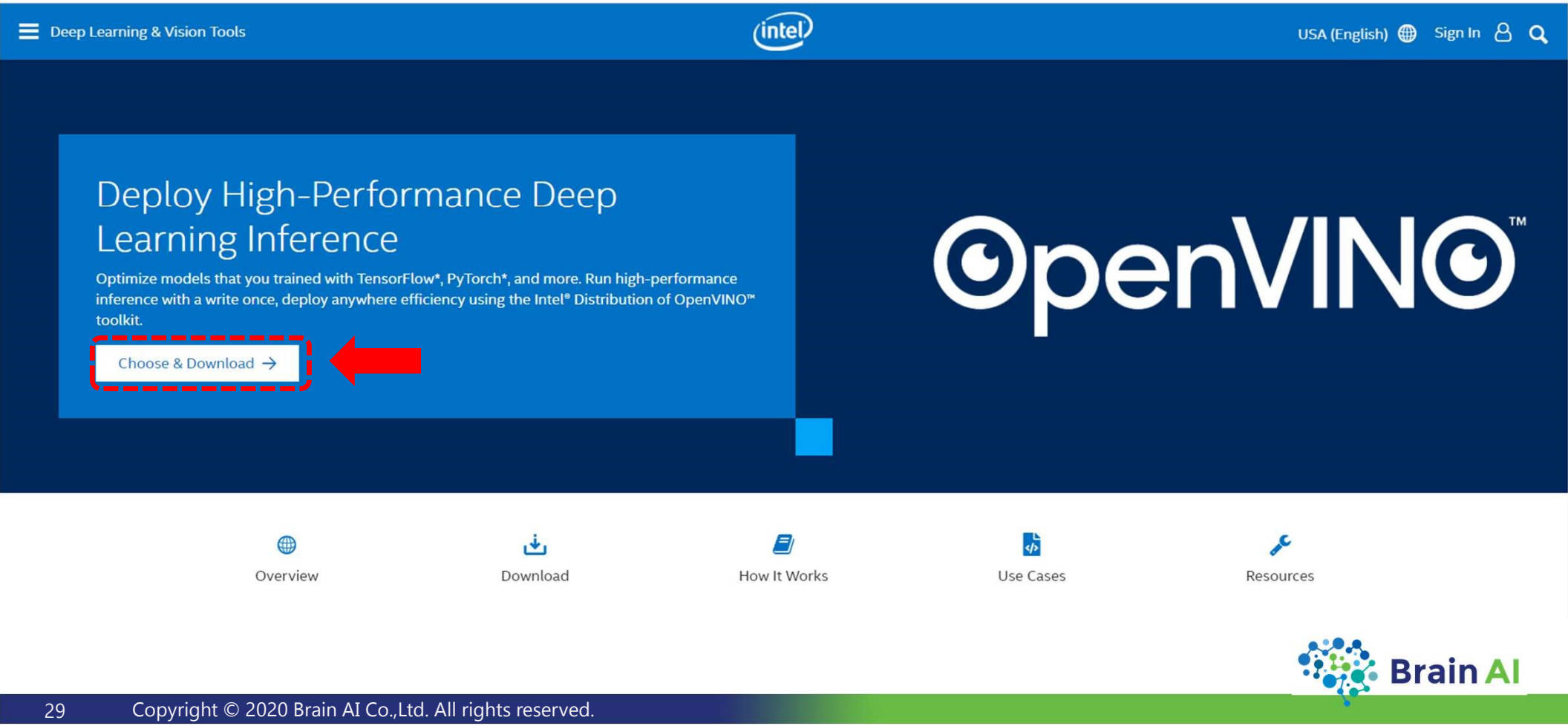
OpenVINO™ 설치



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OpenVINO™ 설치

Download the Intel® Distribution of OpenVINO™ toolkit today

Develop High Performance Computer Vision & Deep Learning Solutions from Device to Cloud

Please choose the operating system for your download *

- (●) Windows ← 선택 ①
- ( ) Linux
- ( ) Windows with FPGA Support
- ( ) Linux with FPGA Support
- ( ) macOS

First Name *
liam

Last Name *
lim

Business Email Address *
kojang07@gmail.com

Company *
Busan Computer Science High school

Country/Region *
Korea, Republic of

Profession *
Professor/Teacher

What best describes your business?*
Academic Institution

입력 ②

Submit ← ③

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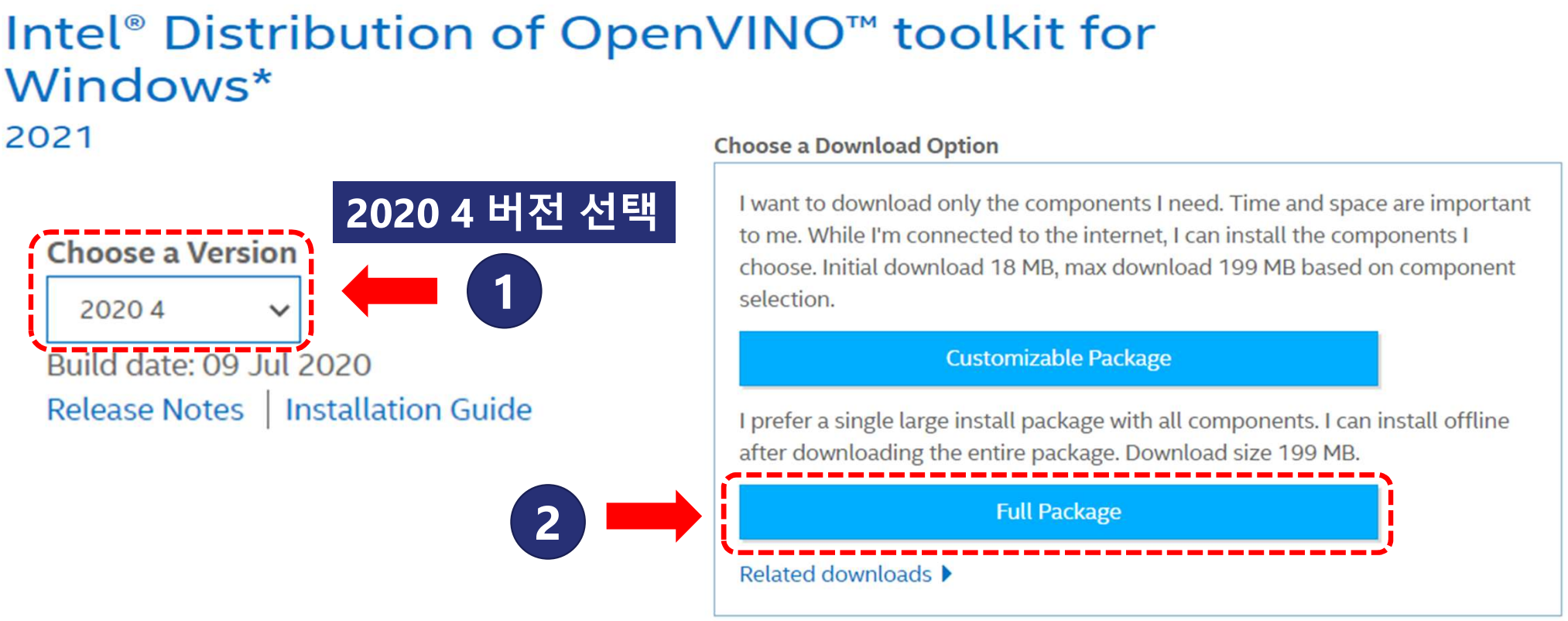
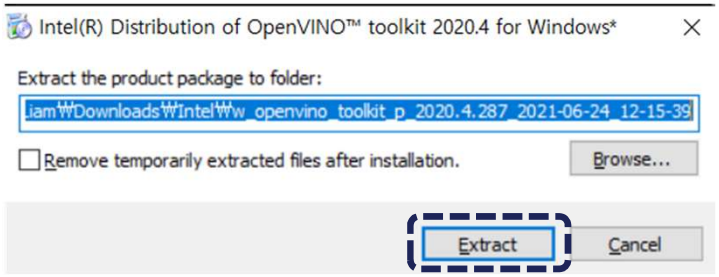
OpenVINO™ 설치



다운로드한 OpenVINO 설치 파일 실행

클릭하여 실행

1



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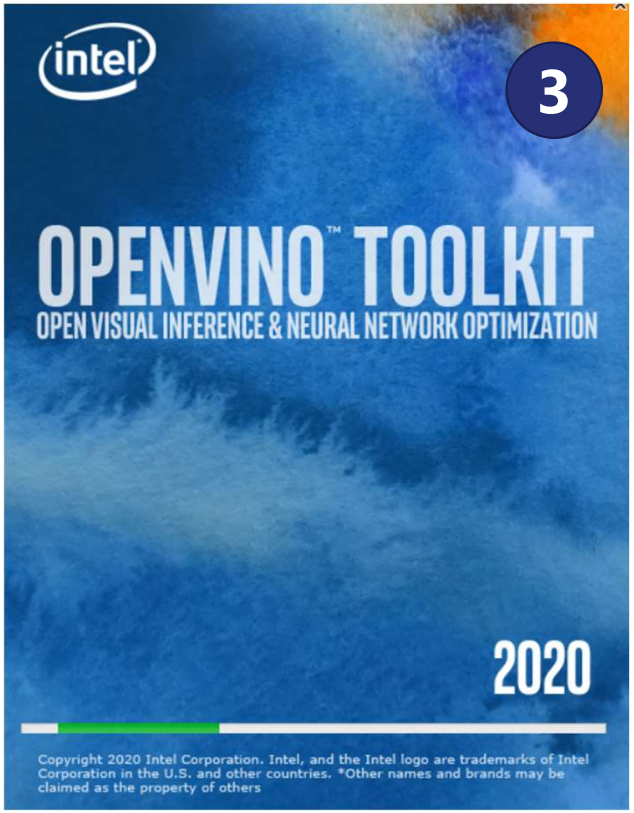

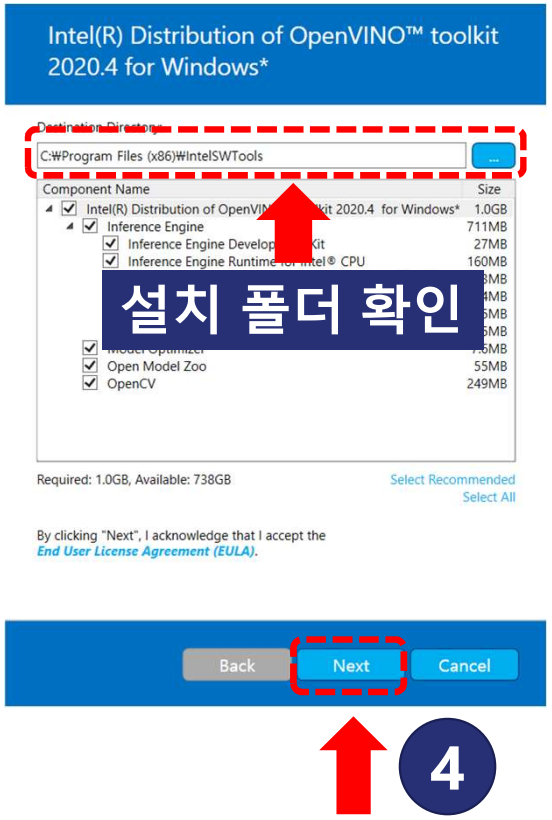

4

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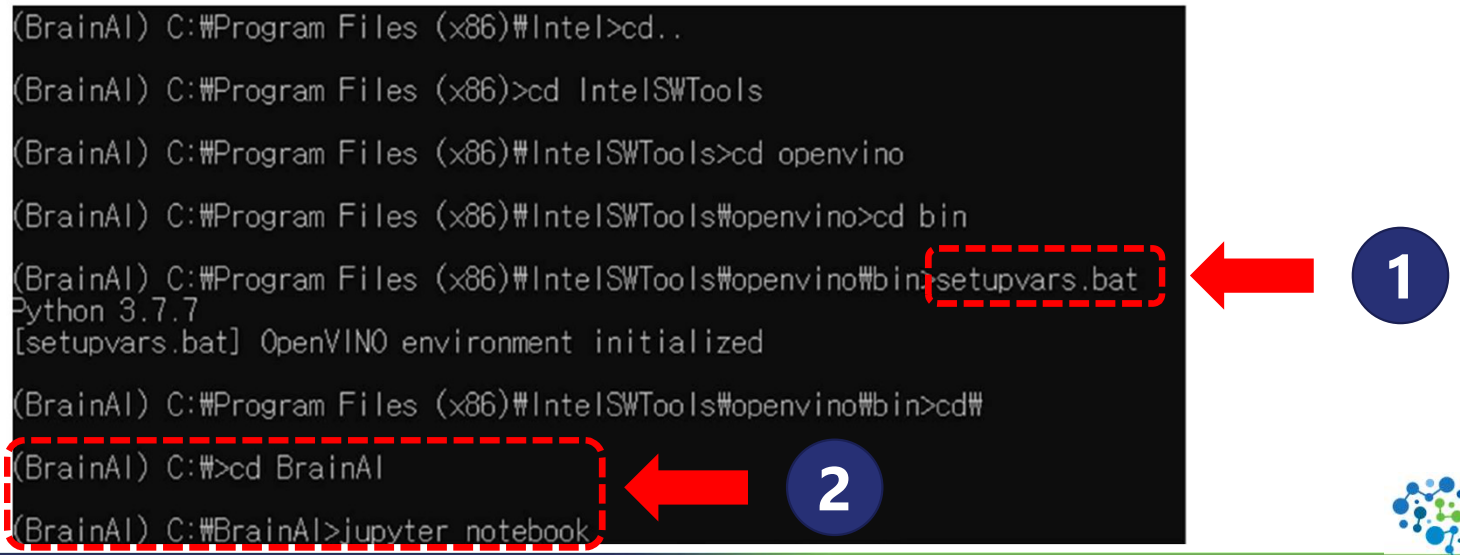
설치한 OpenVINO 확인

- **Anaconda Prompt(BrainAI) 실행**
- **아래 그림과 같이 설치 경로로 이동후 환경변수 실행**
  - ✓ **해당 경로로 이동 :** `(BrainAI) C:₩Program Files (x86)₩IntelSWTools₩openvino₩bin>`
  - ✓ **환경변수 실행 : setupvars.bat**



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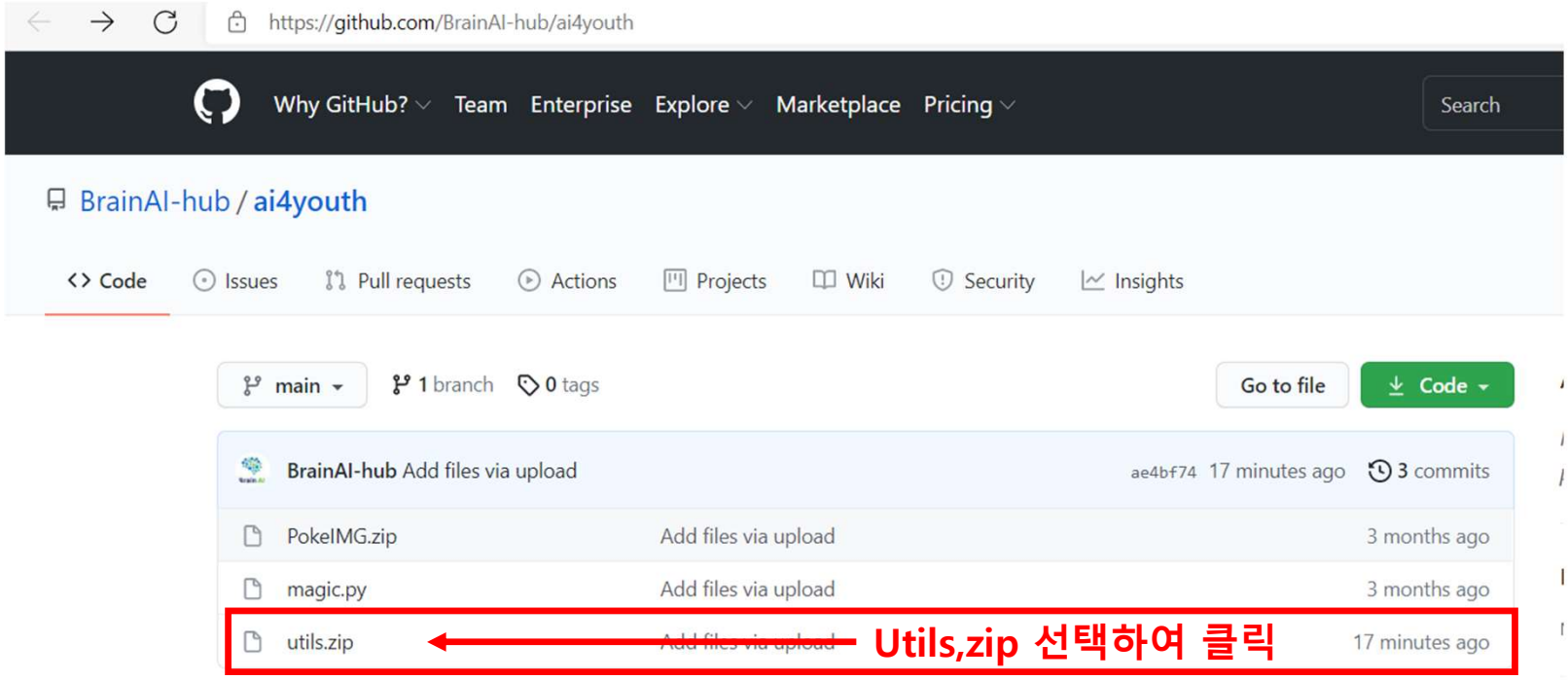
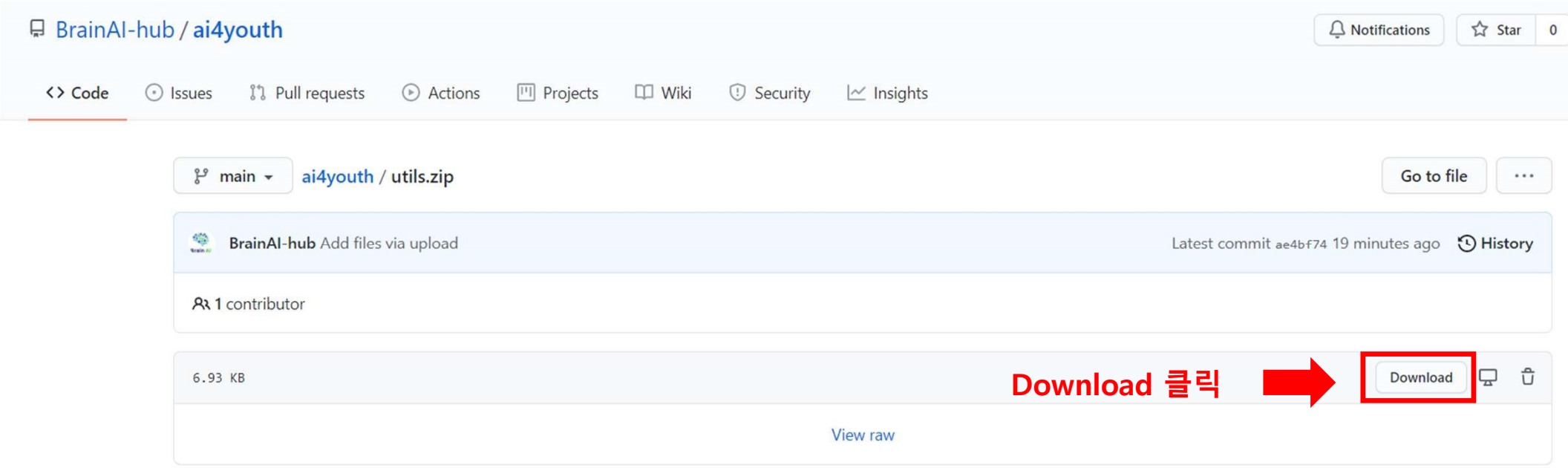
utils 폴더 다운로드

- utils 다운로드 방법
  - Github 접속해서 utils 다운로드

https://github.com/BrainAI-hub/ai4youth

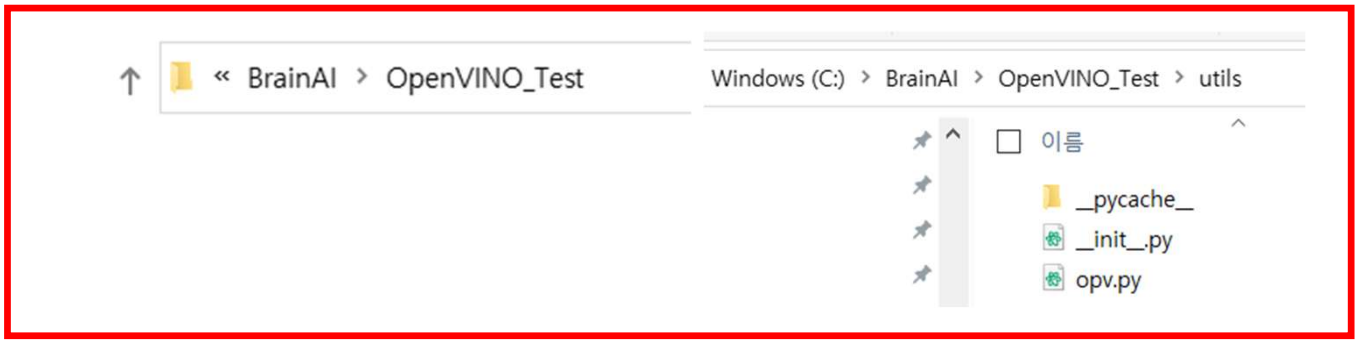


- **utils 다운로드 방법**
  - **Github 접속해서 utils 다운로드**



- **utils 다운로드 방법**
  - **Github 접속해서 utils 다운로드**

OpenVINO_Test 프로젝트 폴더에 복사해서 압축을 풀어주세요.



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OpenVINO 테스트

OpenVINO 환경 실행

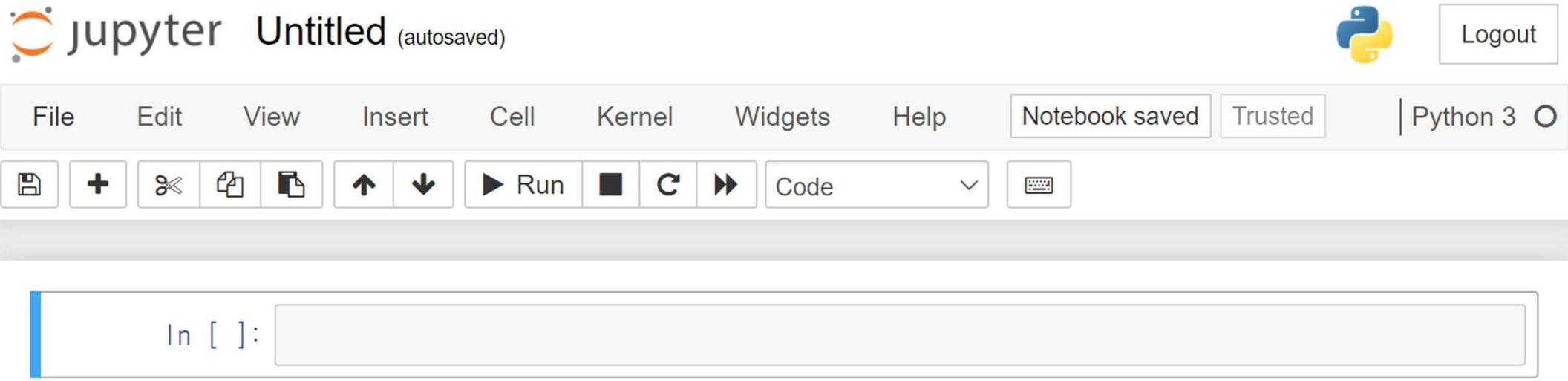
- **Anaconda Prompt(BrainAI) 실행**
- **아래 그림과 같이 설치 경로로 이동후 환경변수 실행**
  - ✓ **해당 경로로 이동 :** `(BrainAI) C:₩Program Files (x86)₩Intel₩openvino₩bin>`
  - ✓ **환경변수 실행 : setupvars.bat**

```
(BrainAI) C:₩Program Files (x86)₩Intel>cd..

(BrainAI) C:₩Program Files (x86)>cd IntelSWTools

(BrainAI) C:₩Program Files (x86)₩IntelSWTools>cd openvino

(BrainAI) C:₩Program Files (x86)₩IntelSWTools₩openvino>cd bin

(BrainAI) C:₩Program Files (x86)₩IntelSWTools₩openvino₩bin>setupvars.bat
Python 3.7.7
[setupvars.bat] OpenVINO environment initialized

(BrainAI) C:₩Program Files (x86)₩IntelSWTools₩openvino₩bin>cd₩

(BrainAI) C:₩>cd BrainAI

(BrainAI) C:₩BrainAI>jupyter notebook
```

OpenVINO 사용시 반드시 환경변수를 먼저 실행해 주어야 합니다.
매번 실행 해 주셔야 합니다.

OpenVINO 테스트

OpenVINO 테스트



OpenVINO 테스트

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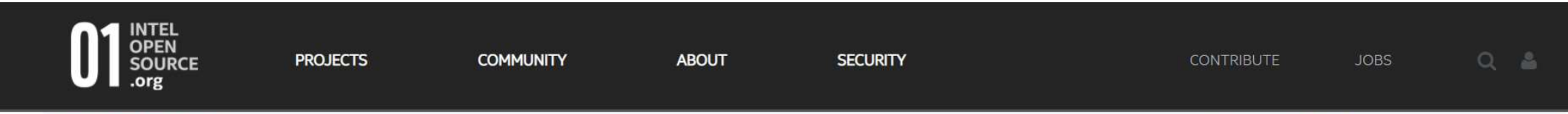
Pre trained Model Zoo 다운로드

Model zoo 다운로드 방법

- 공개 모델 세트(Public Model Set) python
  https://download.01.org/opencv/2021/openvinotoolkit/2021.2/open_model_zoo/models_bin/3/
  에서 Model zoo를 다운 받을 수 있습니다.

Model zoo 다운로드 방법



face-detection-0205/	-	2020-Dec-10 16:54
face-detection-0206/	-	2020-Dec-10 16:54
face-detection-adas-0001/	-	2020-Dec-10 16:54
face-detection-retail-0004/	-	2020-Dec-10 16:54
face-detection-retail-0005/	-	2020-Dec-10 16:54
facial-landmarks-35-adas-0002/	-	2020-Dec-10 16:54
faster-rcnn-resnet101-coco-sparse-60-0001/	-	2020-Dec-10 16:54
formula-recognition-medium-scan-0001/	-	2020-Dec-10 16:54
formula-recognition-polynomials-handwritten-0001/	-	2020-Dec-10 16:54
gaze-estimation-adas-0002/	-	2020-Dec-10 16:54
handwritten-japanese-recognition-0001/	-	2020-Dec-10 16:54
handwritten-score-recognition-0003/	-	2020-Dec-10 16:54
handwritten-simplified-chinese-recognition-0001/	-	2020-Dec-10 16:54

필요한 model 선택하여 클릭

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Model zoo 다운로드 방법

FILE NAME ↓	FILE SIZE ↓	DATE ↓
Parent directory/	-	-
FP16/	-	2020-Dec-10 16:54
FP16-INT8/	-	2020-Dec-10 16:54
FP32/	-	2020-Dec-10 16:54

CPU용 FP32 클릭

FILE NAME ↓	FILE SIZE ↓	DATE ↓
Parent directory/	-	-
face-detection-adas-0001.bin	4.0 MiB	2020-Dec-10 17:14
face-detection-adas-0001.xml	220.7 KiB	2020-Dec-10 17:14

bin, xml 파일 각각 클릭하여 다운로드후 폴더 저장

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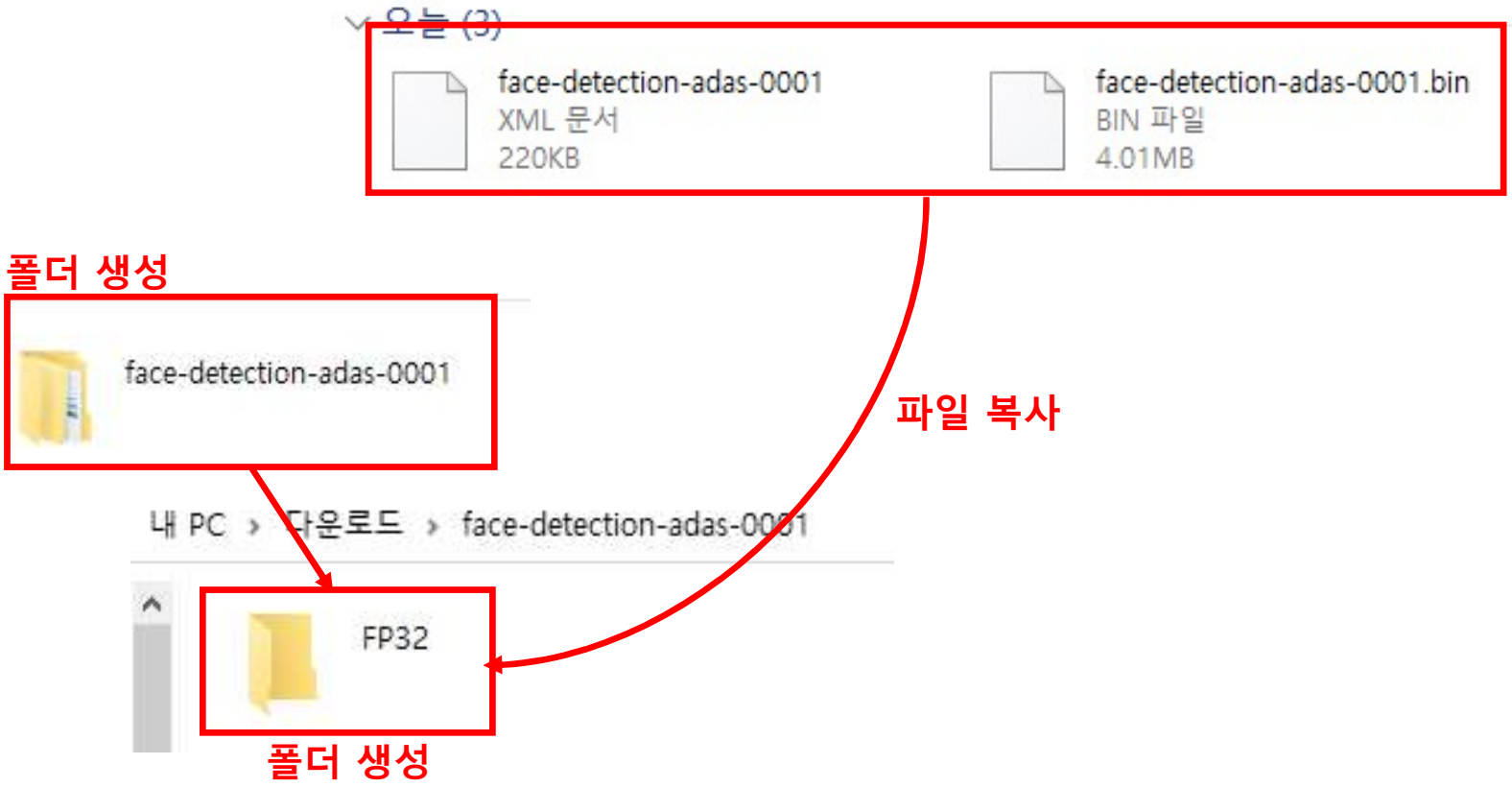
Model zoo 다운로드 방법



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수고하셨습니다.