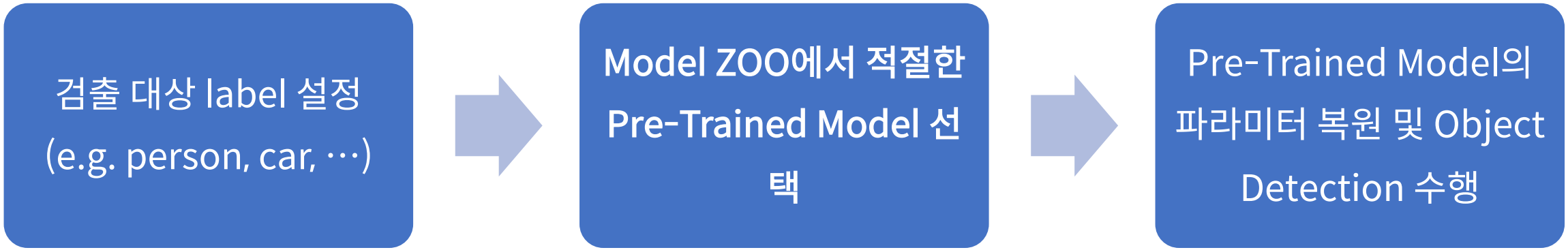
Pre-Trained Model을 사용한 Object Detection 수행방법

- TensorFlow Object Detection API에서 제공하는 Pre-Trained Model을 잘 활용하면 **추가적인 재학습 과정 없이 손쉽게 원하는 물체에 대한 Object Detection을 수행**할 수 있습니다.



TensorFlow Object Detection API에서 제공하는 다양한 Object Detection을 위한 최신 모델들

- TensorFlow Object Detection API는 다음과 같은 최신 Object Detection 모델의 다양한 backbone을 이용한 구현을 제공합니다.

① Faster R-CNN

② SSD(Single Shot Multi-box Detector)

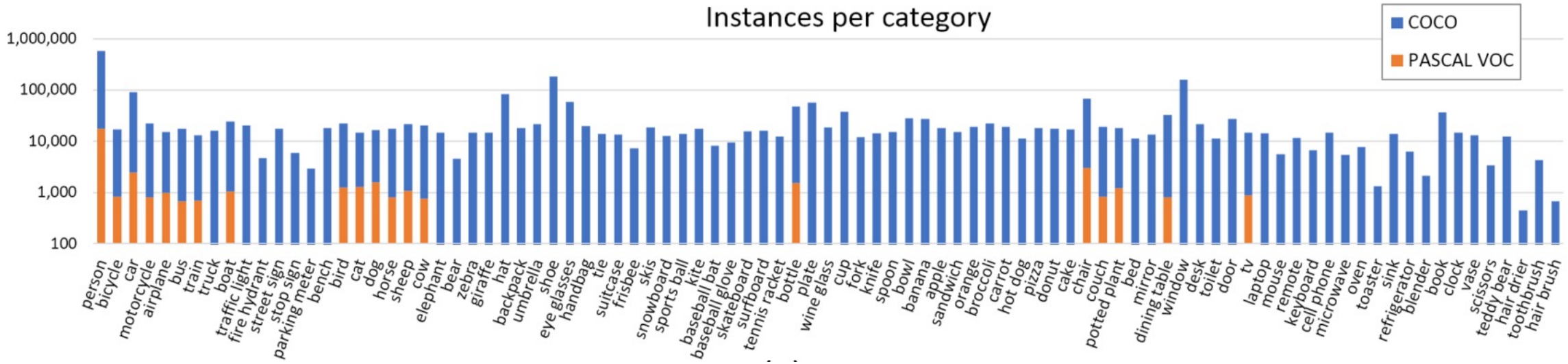
③ RetinaNet

④ CenterNet

⑤ EfficientDet

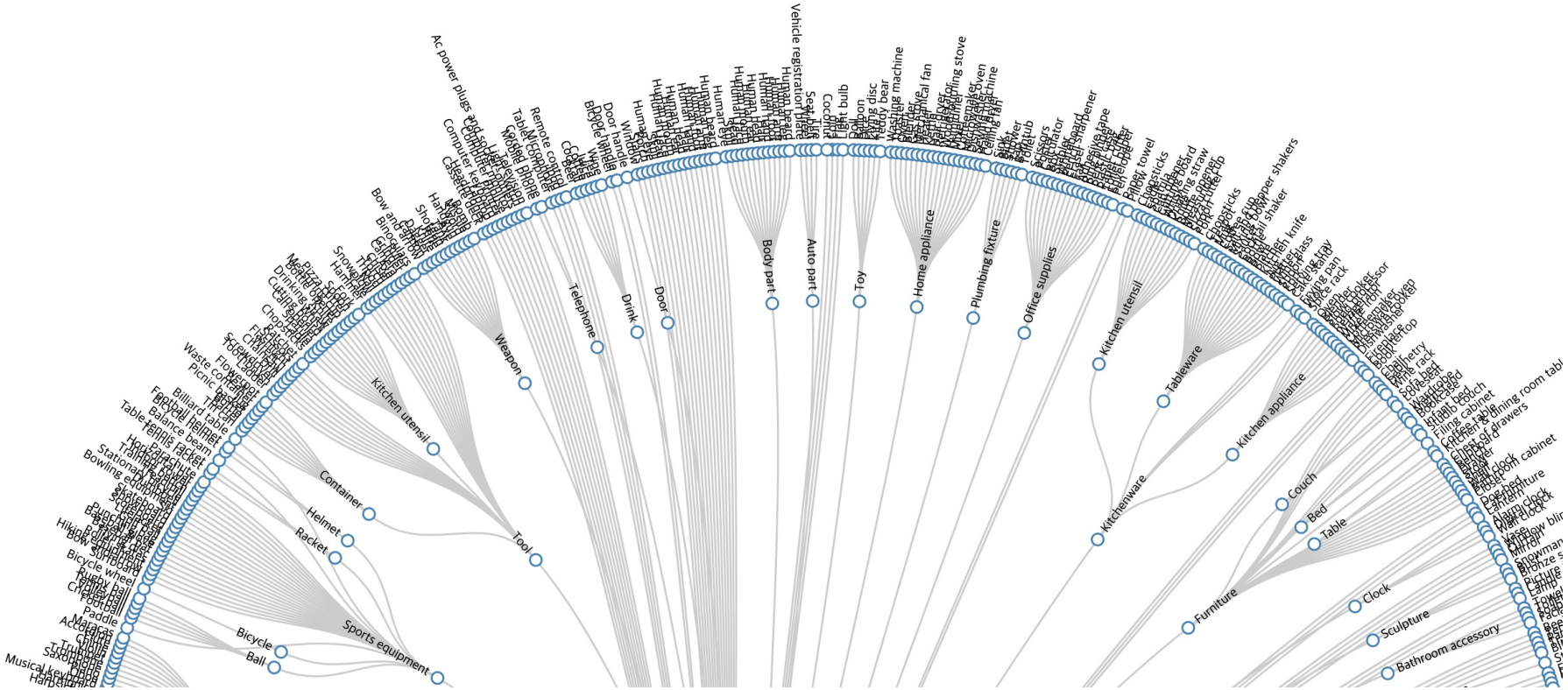
Open Datasets – MS-COCO

- MS COCO 데이터셋은 **80,000장**의 training image, **40,000장**의 validation image, **20,000장**의 test image로 구성되어 있고 **80개의 label**로 구성되어 있습니다.
- https://gist.github.com/AruniRC/7b3dadd004da04c80198557db5da4bda



Open Datasets - Open Images Dataset v4 Labels

- Google Open Images Dataset **600개**의 Label로 구성되어 있습니다.
- https://storage.googleapis.com/openimages/web/download.html



Object Detection Model ZOO에서 제공하는 Pre-Trained Faster R-CNN 리스트 (TensorFlow 2.x)

- https://github.com/tensorflow/models/blob/master/research/object_detection/g3doc/tf2_detection_zoo.md
- Pre-Trained 데이터셋 : MS-COCO 2017 Dataset

Faster R-CNN ResNet50 V1 640x640	53	29.3	Boxes
Faster R-CNN ResNet50 V1 1024x1024	65	31.0	Boxes
Faster R-CNN ResNet50 V1 800x1333	65	31.6	Boxes
Faster R-CNN ResNet101 V1 640x640	55	31.8	Boxes
Faster R-CNN ResNet101 V1 1024x1024	72	37.1	Boxes
Faster R-CNN ResNet101 V1 800x1333	77	36.6	Boxes
Faster R-CNN ResNet152 V1 640x640	64	32.4	Boxes
Faster R-CNN ResNet152 V1 1024x1024	85	37.6	Boxes
Faster R-CNN ResNet152 V1 800x1333	101	37.4	Boxes
Faster R-CNN Inception ResNet V2 640x640	206	37.7	Boxes
Faster R-CNN Inception ResNet V2 1024x1024	236	38.7	Boxes

Object Detection Model ZOO에서 제공하는 Pre-Trained 모델 리스트 (TensorFlow 1.x)

- https://github.com/tensorflow/models/blob/master/research/object_detection/g3doc/tf1_detection_zoo.md
- Pre-Trained 데이터셋 : MS-COCO 2017 Dataset, KITTI Dataset, Open Images dataset, AVA v2.1 dataset, iNaturalist Species Detection Dataset, Snapshot Serengeti Dataset

Open Images-trained models

Model name	Speed (ms)	Open Images mAP@0.5[^2]	Outputs
faster_rcnn_inception_resnet_v2_atrous_oidv2	727	37	Boxes
faster_rcnn_inception_resnet_v2_atrous_lowproposals_oidv2	347		Boxes
facessd_mobilenet_v2_quantized_open_image_v4 [^3]	20	73 (faces)	Boxes

Model name	Speed (ms)	Open Images mAP@0.5[^4]	Outputs
faster_rcnn_inception_resnet_v2_atrous_oidv4	425	54	Boxes
ssd_mobilenetv2_oidv4	89	36	Boxes
ssd_resnet_101_fpn_oidv4	237	38	Boxes

Pre-Trained Model을 이용한 Object Detection 실습

- 다양한 label들에 대해서 Pre-Trained Model을 이용해서 Object Detection을 수행해봅시다.

① Person Detection

② Car Detection

③ Autopilot Detection

④ Face Detection

Thank you!