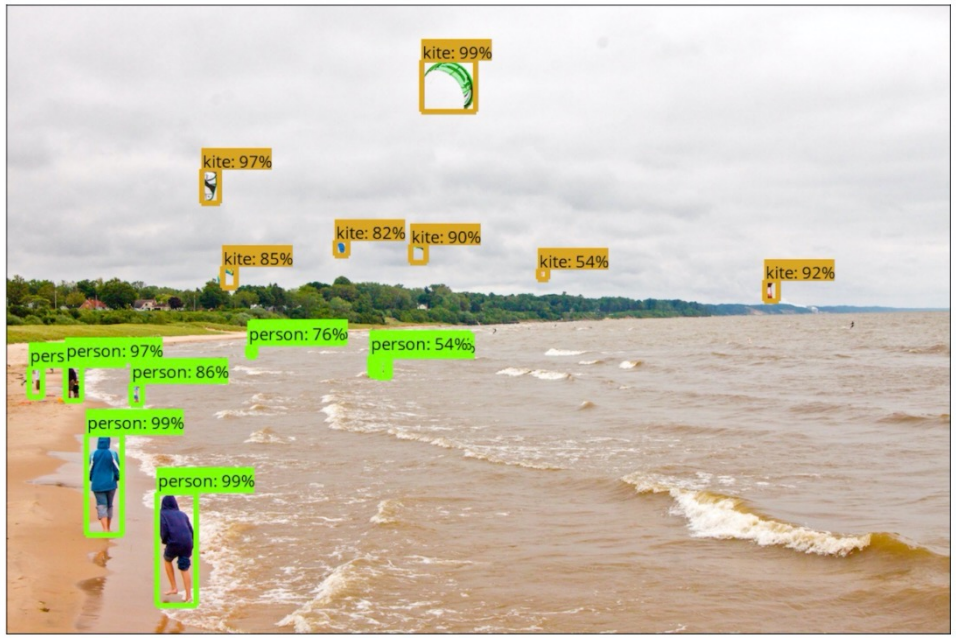
TensorFlow Object Detection API

TensorFlow Object Detection API

TensorFlow 2.2 | TensorFlow 1.15 | Python 3.6

Creating accurate machine learning models capable of localizing and identifying multiple objects in a single image remains a core challenge in computer vision. The TensorFlow Object Detection API is an open source framework built on top of TensorFlow that makes it easy to construct, train and deploy object detection models. At Google we've certainly found this codebase to be useful for our computer vision needs, and we hope that you will as well.



Contributions to the codebase are welcome and we would love to hear back from you if you find this API useful. Finally if you use the TensorFlow Object Detection API for a research publication, please consider citing:

TensorFlow Object Detection API

- TensorFlow Object Detection API는 Google에서 최신 Object Detection 모델들을 구현해서 제공하는 저장소입니다. Google 내부에서 Computer Vision 연구를 위해 구현한뒤 코드를 오픈소스로 공개하였습니다.
- https://github.com/tensorflow/models/tree/master/research/object_detection
- 기본적으로는 Google에서 TensorFlow 코드들을 모아놓은 models 저장소의 object_detection이라는 하위 폴더로 존재합니다.
- https://github.com/tensorflow/models

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

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

TensorFlow Object Detection API의 장점과 단점

- **장점** : 구글 내부에서 사용할 목적으로 만든 소스코드이기 때문에 상대적으로 고퀄리티의 안정적으로 동작하는 최신 Object Detection 모델을 사용가능
- **단점** : 구글 내부에서 사용할 목적으로 만든 소스코드이기 때문에 사용성이 상대적으로 떨어짐

Thank you!