

Object Detector



공사현장 안전장비 검출 모델 개발

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공사현장 안전장비 검출 모델

- 모델 사양

```
YOLO_TYPE           = "yolov4"  
YOLO_FRAMEWORK      = "tensorflow "  
YOLO_INPUT_SIZE     = 416  
MODEL_NAME          = "Yolov4-AI20210801_50000"  
TRAIN_BATCH_SIZE    = 21  
TEST_SCORE_THRESHOLD = 0.3  
TEST_IOU_THRESHOLD  = 0.45
```

공사현장 안전장비 검출용 데이터 개요

- 개요
 - [AI Hub 공사현장 안전장비 인식 데이터](#)
 - image file number : 1,984,333
 - label file number : 236,1008
- 공사현장 안전장구 8종 dataset

구분		Number	Description
Image file		851,063	
안전장구 Sample	1 벨트착용	1205131	0 벨트착용
	2 벨트미착용	878174	1 벨트미착용
	3 안전고리착용	34092	
	4 안전고리미착용	245186	
	5 안전화착용	1255514	2 안전화착용
	6 안전화미착용	160794	3 안전화미착용
	7 안전모착용	1323754	4 안전모착용
	8 안전모미착용	246279	5 안전모미착용
	계	5348924	

공사현장 안전장비 데이터세트, SGD_ds10000

- **SGD_ds10000**

- Description

이미지 26,154, 안전장구당 10,000샘플이상 총 170,813 samples

구분		Train	Test/Validation	Total
Image file		19,615	6,539	26,154
안전장구 Sample	0 벨트착용	32,709	10,887	43,596
	1 벨트미착용	19,357	6,722	26,079
	2 안전화착용	30,913	10,290	41,203
	3 안전화미착용	7,390	2,613	10,003
	4 안전모착용	24,490	8,232	32,722
	5 안전모미착용	12,860	4,350	17,210
	계	127,719	43,094	170,813

공사현장 안전장비 데이터세트, SGD_ds50000

- **SGD_ds50000**

- Description

이미지 **112,886**, 안전장구당 50,000샘플이상 총 **674,928** samples

구분		Train	Test/Validation	Total
Image		84,664	28,222	112,886
안전장구 Sample	0 벨트착용	118,701	39,443	158,144
	1 벨트미착용	95,974	31,986	127,960
	2 안전화착용	110,558	37,207	147,765
	3 안전화미착용	37,748	12,252	50,000
	4 안전모착용	80,922	26,820	107,742
	5 안전모미착용	62,507	20,810	83,317
	계	506,410	168,518	674,928

공사현장 안전장비 검출 모델 개발

- 안전장비 검출 모델 Model SGD_10000

- 모델 사양

- YOLO_TYPE = "yolov4"
- YOLO_FRAMEWORK = "tensorflow "
- YOLO_INPUT_SIZE = 416
- MODEL_NAME = "Yolov4-AI20210801_10000"
- TRAIN_BATCH_SIZE = 21
- TEST_SCORE_THRESHOLD = 0.3
- TEST_IOU_THRESHOLD = 0.45
- DATASET = "SGD_ds10000"

- 모델 성능

- 학습처리시간

- 2021-08-05 21:10:03 ~ 2021-08-09 03:19:55 (2 days, 11:59:10.19)
- epoch:81/100

- Validation loss

- giou_val_loss : 6.011,
- conf_val_loss : 4.969,
- prob_val_loss : 4.750,
- total_val_loss/Best: 15.730 / 13.736

- Mean Average Precision

- mAP : 86.754 %

공사현장 안전장비 데이터세트

- 안전장비검출 모델 Model SGD_50000

- 모델사양

- YOLO_TYPE = "yolov4"
- YOLO_FRAMEWORK = "tensorflow "
- YOLO_INPUT_SIZE = 416
- MODEL_NAME = "Yolov4-AI20210801_50000"
- TRAIN_BATCH_SIZE = 21
- TEST_SCORE_THRESHOLD = 0.3
- TEST_IOU_THRESHOLD = 0.45
- DATASET = "SGD_ds50000"

- 모델성능

- 학습처리시간

- 2021-08-09 14:13:36 ~ (16 days ?)
- Epoch :

- Validation loss

- giou_val_loss :
- conf_val_loss :
- prob_val_loss :
- total_val_loss/Best:

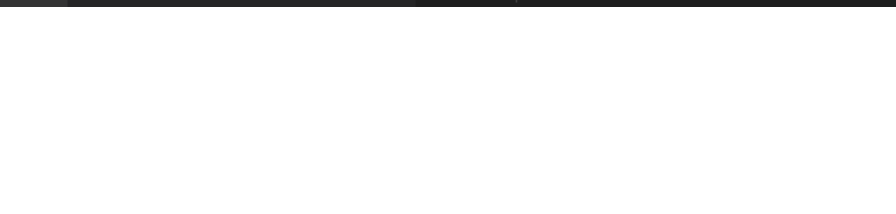
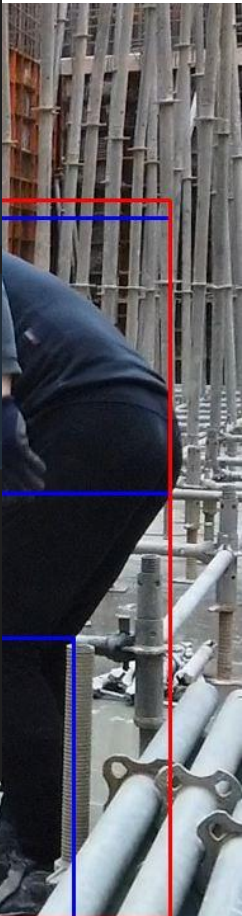
- Mean Average Precision

- mAP :

공사현장 안전장비 검출기 클래스 Class SaftyGearDetector

```
object_detector.py - SaftyGearDetector - Visual Studio Code

object_detector.py X
object_detector.py
1 import os
2 from typing import List
3 os.environ['TF_CPP_MIN_LOG_LEVEL'] = '1'
4 import numpy as np
5 import tensorflow as tf
6 import cv2
7 import configs
8 import copy
9
10 > class object_detector : ...
160 > class Person(List) : ...
181 class SaftyGearDetector(object_detector) :
182 > def __init__(self, model_path=r'models\yolov4-AI20210801_10000F.h5'): ...
185 > def detect_rgb(self, img_rgb): ...
189 > def detect_bgr(self, img_bgr): ...
192 > def detect_path(self, path) : ...
195 > def get_names(self, bbs) : ...
198 > def recognize_person(self, bs) : ...
271 > def detect_people_bgr(self, img_bgr): ...
275
276 if __name__ == '__main__':
277     sgd=SaftyGearDetector()
278     img_bgr=cv2.imread(r'models\S2-N2201M02549.jpg')
279     peoples=sgd.detect_people_bgr(img_bgr)
280     print(peoples)
281     """
282     peoples=[{'person': 0, 'frame': [292, 328, 426, 517], 'SaftyEquips': [[305, 328, 369, 404, 4], [292, 392, 426, 517, 1]]},
283             {'person': 1, 'frame': [1065, 388, 1167, 497], 'SaftyEquips': [[1065, 388, 1167, 497, 0]]},
284             {'person': 2, 'frame': [1161, 362, 1467, 928], 'SaftyEquips': [[1161, 362, 1248, 469, 4], [1229, 376, 1467, 593, 1], [1289, 707, 1391, 928, 2]]}]
285     """
```




```
192 > def detect_path(self,path) :...
195 > def get_names(self,bbs) :...
198 > def recognize_person(self,bs) :...
271 > def detect_people_bgr(self,img_bgr):...
275
276 if __name__ == '__main__':
277     sgd=SaftyGearDetector()
278     img_bgr=cv2.imread(r'models\S2-N2201M02549.jpg')
279     peoples=sgd.detect_people_bgr(img_bgr)
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283             {'person': 1, 'frame': [1065, 388, 1167, 497], 'SaftyEquips': [[1065, 388, 1167, 497, 0]]},
284             {'person': 2, 'frame': [1161, 362, 1467, 928], 'SaftyEquips': [[1161, 362, 1248, 469, 4], [1229, 376, 1467, 593, 1], [1289, 707, 1391, 928, 2]]}]
285     """
```



The End