

Smoke & Fire 모델 학습 시키기

<https://github.com/ultralytics/ultralytics>

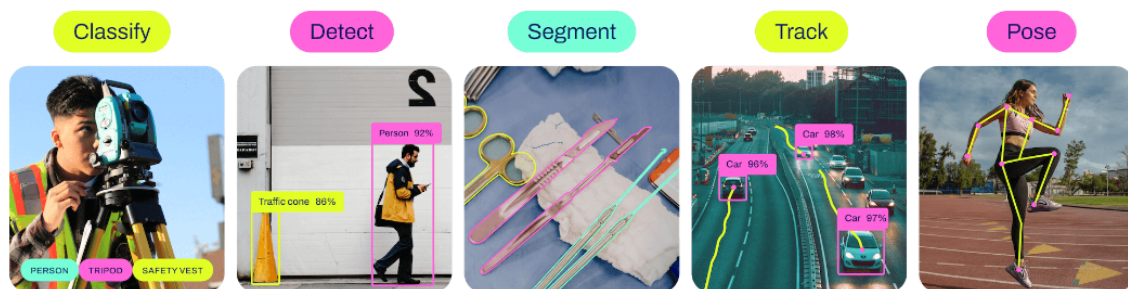
YOLOv8 학습 시 알아야할 것

YOLO 에는 4가지 분야가 존재

[Models](#) download automatically from the latest Ultralytics [release](#). See YOLOv8 [Python Docs](#) for more examples.

Models

YOLOv8 [Detect](#), [Segment](#) and [Pose](#) models pretrained on the [COCO](#) dataset are available here, as well as YOLOv8 [Classify](#) models pretrained on the [ImageNet](#) dataset. [Track](#) mode is available for all Detect, Segment and Pose models.

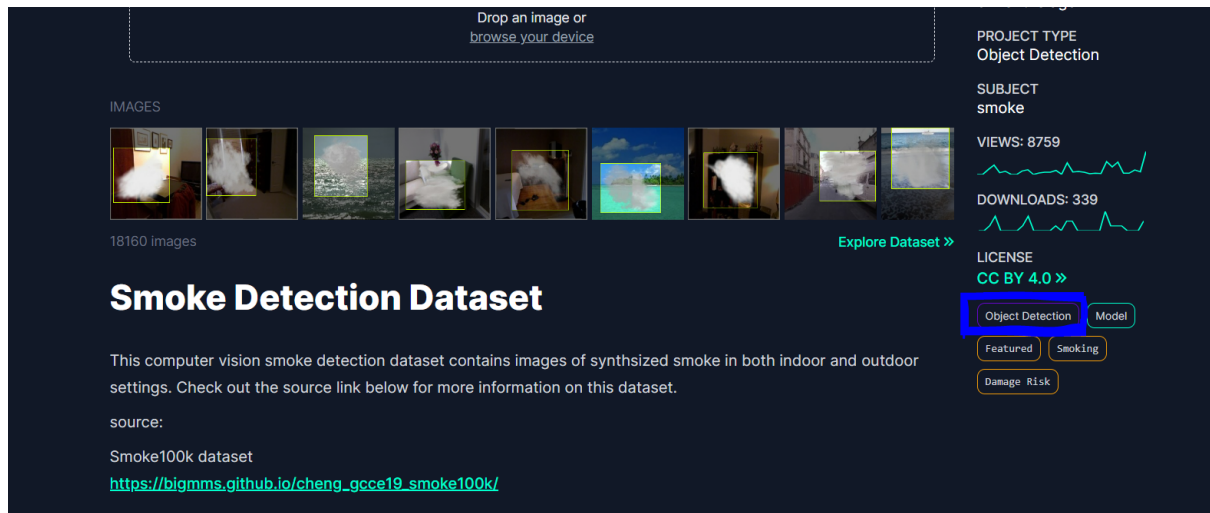


All [Models](#) download automatically from the latest Ultralytics [release](#) on first use.

- ▶ Detection
- ▶ Segmentation
- ▶ Classification
- ▶ Pose

```
File C:\Python37\python.exe [1000] ...
'as an example.\nSee https://docs.ultralytics.com/tasks/segment/ for help.') from e
TypeError: ERROR ✖ segment dataset incorrectly formatted or not a segment dataset.
This error can occur when incorrectly training a 'segment' model on a 'detect' dataset, i.e. 'yolo train model=yolov8n-seg.pt data=coco128.yaml'.
Verify your dataset is a correctly formatted 'segment' dataset using 'data=coco128-seg.yaml' as an example.
See https://docs.ultralytics.com/tasks/segment/ for help.
PS C:\Users\SSAFY\Desktop\firesmoke> & C:/Python37/python.exe c:/Users/SSAFY/Desktop/firesmoke/firesmoke.py
<class 'dict'> 80
```

위의 에러가 발생했던 이유는 현재 내가 가져온 데이터셋은 Object Detect 인데



작성한 코드는 segmentation 을 하라는 코드를 썼기 때문이다.

작성 코드

```
from ultralytics import YOLO

def run():
    model = YOLO('yolov8n-seg.pt') # load a pretrained YOLOv8n segmentation model
    print(type(model.names), len(model.names))
    print(model.names)

    model.train(data='C:/Users/SSAFY/Desktop/firesmoke/data.yaml', epochs=30, batch=8)

    results = model.predict(source = "0", show=True)

    print(results)

if __name__ == '__main__':
    run()
```

▼ Detection

See [Detection Docs](#) for usage examples with these models.

Model	size (pixels)	mAP ^{val} 50-95	Speed CPU ONNX (ms)	Speed A100 TensorRT (ms)	params (M)	FLOPs (B)
YOLOv8n	640	37.3	80.4	0.99	3.2	8.7
YOLOv8s	640	44.9	128.4	1.20	11.2	28.6
YOLOv8m	640	50.2	234.7	1.83	25.9	78.9
YOLOv8l	640	52.9	375.2	2.39	43.7	165.2
YOLOv8x	640	53.9	479.1	3.53	68.2	257.8

▼ Segmentation

See [Segmentation Docs](#) for usage examples with these models.

Model	size (pixels)	mAP ^{box} 50-95	mAP ^{mask} 50-95	Speed CPU ONNX (ms)	Speed A100 TensorRT (ms)	params (M)	FLOPs (B)
YOLOv8n-seg	640	36.7	30.5	96.1	1.21	3.4	12.6
YOLOv8s-seg	640	44.6	36.8	155.7	1.47	11.8	42.6
YOLOv8m-seg	640	49.9	40.8	317.0	2.18	27.3	110.2
YOLOv8l-seg	640	52.3	42.6	572.4	2.79	46.0	220.5
YOLOv8x-seg	640	53.4	43.4	712.1	4.02	71.8	344.1

따라서 가져온 데이터셋의 종류에 맞추어 코드를 바꿔주면 된다.

```
from ultralytics import YOLO

def run():
    model = YOLO('yolov8n.pt') # load a pretrained YOLOv8n segmentation model
    print(type(model.names), len(model.names))
    print(model.names)

    model.train(data='C:/Users/SSAFY/Desktop/firesmoke/data.yaml', epochs=30, batch=8)

    results = model.predict(source = "0", show=True)
```

```
print(results)

if __name__ == '__main__':
    run()
```

Epoch 1/30	GPU_mem 1.14G	box_loss 1.248	cls_loss 2.092	dfl_loss 1.632	Instances 19	Size 640: 100%	856/856	[03:21<00:00, 4.25it/s]
	Class Images	Instances	Box(P	R		mAP50	mAP50-95): 100%	122/122 [00:21<00:00, 5.61it/s]
	all 1945	2099	0.465	0.406		0.255	0.169	
Epoch 2/30	GPU_mem 1.21G	box_loss 1.177	cls_loss 1.49	dfl_loss 1.547	Instances 11	Size 640: 100%	856/856	[03:17<00:00, 4.33it/s]
	Class Images	Instances	Box(P	R		mAP50	mAP50-95): 100%	122/122 [00:21<00:00, 5.72it/s]
	all 1945	2099	0.702	0.391		0.236	0.16	
Epoch 3/30	GPU_mem 1.19G	box_loss 1.16	cls_loss 1.379	dfl_loss 1.526	Instances 6	Size 640: 100%	856/856	[03:21<00:00, 4.25it/s]
	Class Images	Instances	Box(P	R		mAP50	mAP50-95): 100%	122/122 [00:23<00:00, 5.09it/s]
	all 1945	2099	0.498	0.507		0.269	0.182	
Epoch 4/30	GPU_mem 1.19G	box_loss 1.136	cls_loss 1.311	dfl_loss 1.51	Instances 12	Size 640: 100%	856/856	[03:20<00:00, 4.27it/s]
	Class Images	Instances	Box(P	R		mAP50	mAP50-95): 100%	122/122 [00:26<00:00, 4.62it/s]
	all 1945	2099	0.708	0.423		0.266	0.188	
Epoch 5/30	GPU_mem 1.16G	box_loss 1.152	cls_loss 1.308	dfl_loss 1.518	Instances 18	Size 640: 16%	133/856	[00:31<02:49, 4.27it/s]

	Class Images	Instances	Box(P	R	mAP50	mAP50-95): 100%	122/122	[00:23<00:00, 5.18it/s]
	all 1945	2099	0.37	0.544	0.316	0.257		
Epoch 24/30	GPU_mem 1.22G	box_loss 0.6705	cls_loss 0.8552	dfl_loss 1.247	Instances 4	Size 640: 100%	856/856	[03:17<00:00, 4.33it/s]
	Class Images	Instances	Box(P	R	mAP50	mAP50-95): 100%	122/122	[00:21<00:00, 5.61it/s]
	all 1945	2099	0.335	0.564	0.314	0.26		
Epoch 25/30	GPU_mem 1.22G	box_loss 0.6514	cls_loss 0.8375	dfl_loss 1.223	Instances 4	Size 640: 100%	856/856	[03:16<00:00, 4.35it/s]
	Class Images	Instances	Box(P	R	mAP50	mAP50-95): 100%	122/122	[00:22<00:00, 5.53it/s]
	all 1945	2099	0.314	0.603	0.311	0.252		
Epoch 26/30	GPU_mem 1.22G	box_loss 0.6384	cls_loss 0.8363	dfl_loss 1.209	Instances 12	Size 640: 100%	856/856	[03:16<00:00, 4.35it/s]
	Class Images	Instances	Box(P	R	mAP50	mAP50-95): 100%	122/122	[00:21<00:00, 5.55it/s]
	all 1945	2099	0.307	0.576	0.324	0.26		
Epoch 27/30	GPU_mem 1.22G	box_loss 0.6359	cls_loss 0.8306	dfl_loss 1.203	Instances 4	Size 640: 100%	856/856	[03:17<00:00, 4.34it/s]
	Class Images	Instances	Box(P	R	mAP50	mAP50-95): 100%	122/122	[00:21<00:00, 5.55it/s]
	all 1945	2099	0.339	0.593	0.325	0.261		
Epoch 28/30	GPU_mem 1.22G	box_loss 0.6126	cls_loss 0.821	dfl_loss 1.19	Instances 4	Size 640: 100%	856/856	[03:19<00:00, 4.29it/s]
	Class Images	Instances	Box(P	R	mAP50	mAP50-95): 100%	122/122	[00:23<00:00, 5.25it/s]
	all 1945	2099	0.34	0.593	0.329	0.268		
Epoch 29/30	GPU_mem 1.22G	box_loss 0.6087	cls_loss 0.8086	dfl_loss 1.182	Instances 4	Size 640: 100%	856/856	[03:19<00:00, 4.29it/s]
	Class Images	Instances	Box(P	R	mAP50	mAP50-95): 4%	5/122	[00:01<00:26, 4.48it/s]

```

Epoch  GPU_mem  box_loss  cls_loss  dfl_loss  Instances  Size
26/30   1.22G    0.6384    0.8363    1.209     12         640: 100%|██████████| 856/856 [03:16<00:00, 4.35it/s]
      Class    Images    Instances    Box(P          R              mAP50  mAP50-95): 100%|██████████| 122/122 [00:21<00:00, 5.55it/s]
      all      1945      2099      0.307      0.576      0.324      0.26

Epoch  GPU_mem  box_loss  cls_loss  dfl_loss  Instances  Size
27/30   1.22G    0.6359    0.8306    1.203      4         640: 100%|██████████| 856/856 [03:17<00:00, 4.34it/s]
      Class    Images    Instances    Box(P          R              mAP50  mAP50-95): 100%|██████████| 122/122 [00:21<00:00, 5.55it/s]
      all      1945      2099      0.339      0.593      0.325      0.261

Epoch  GPU_mem  box_loss  cls_loss  dfl_loss  Instances  Size
28/30   1.22G    0.6126    0.821     1.19      4         640: 100%|██████████| 856/856 [03:19<00:00, 4.29it/s]
      Class    Images    Instances    Box(P          R              mAP50  mAP50-95): 100%|██████████| 122/122 [00:23<00:00, 5.25it/s]
      all      1945      2099      0.34       0.593      0.329      0.268

Epoch  GPU_mem  box_loss  cls_loss  dfl_loss  Instances  Size
29/30   1.22G    0.6087    0.8086    1.182      4         640: 100%|██████████| 856/856 [03:19<00:00, 4.29it/s]
      Class    Images    Instances    Box(P          R              mAP50  mAP50-95): 100%|██████████| 122/122 [00:25<00:00, 4.74it/s]
      all      1945      2099      0.335      0.605      0.335      0.271

Epoch  GPU_mem  box_loss  cls_loss  dfl_loss  Instances  Size
30/30   1.22G    0.5942    0.8082    1.172      4         640: 100%|██████████| 856/856 [03:18<00:00, 4.31it/s]
      Class    Images    Instances    Box(P          R              mAP50  mAP50-95): 100%|██████████| 122/122 [00:24<00:00, 4.97it/s]
      all      1945      2099      0.356      0.598      0.337      0.269

30 epochs completed in 1.891 hours.
Optimizer stripped from runs\detect\train\weights\last.pt, 6.3MB
Optimizer stripped from runs\detect\train\weights\best.pt, 6.3MB

Validating runs\detect\train\weights\best.pt...
ultralytics YOLOv8.0.145 Python-3.7.5 torch-1.7.1+cu110 CUDA:0 (GeForce RTX 3050 Ti Laptop GPU, 4096MiB)
Model summary (fused): 168 layers, 3006428 parameters, 0 gradients
      Class    Images    Instances    Box(P          R              mAP50  mAP50-95): 26%|██████████| 32/122 [00:06<00:19, 4.53it/s]

```

```

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def run():
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```

학습완료 후 테스트 함

결과

