



Roboflow

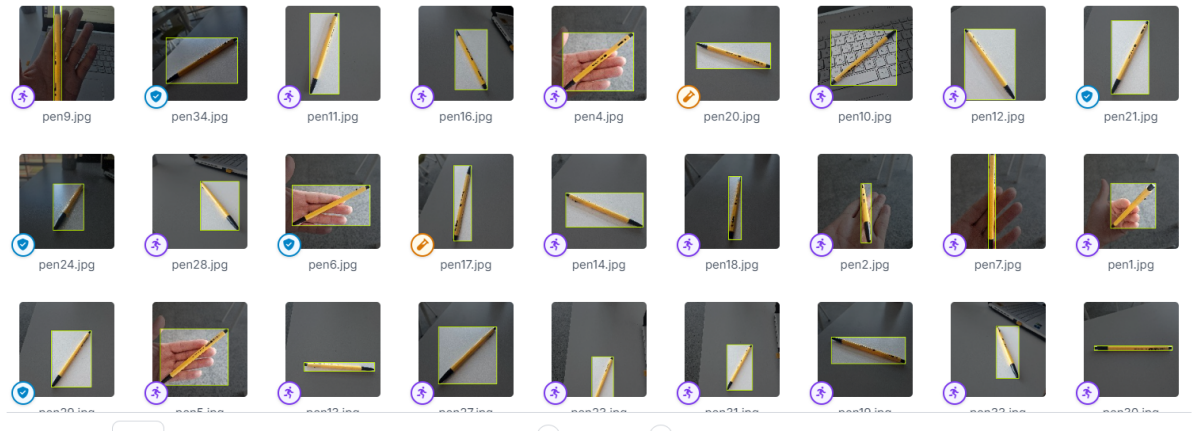
Roboflow는 컴퓨터 비전 프로젝트에서 데이터 전처리와 모델 훈련을 쉽게 할 수 있도록 도와주는 플랫폼입니다. 다음과 같은 이유로 Roboflow를 사용하는 경우가 많습니다:

1. **데이터 전처리 용이성:** Roboflow는 이미지 라벨링, 크기 조정, 데이터 증강(augmentation) 등의 기능을 제공하여, AI 모델 훈련에 적합한 데이터셋을 쉽게 준비할 수 있습니다. 특히 다양한 증강 옵션을 통해 모델의 일반화 성능을 향상시킬 수 있습니다.
2. **다양한 포맷 지원:** Roboflow는 YOLO, TensorFlow, PyTorch 등 여러 인기 있는 딥러닝 프레임워크에서 사용할 수 있는 데이터셋 포맷을 지원합니다. 이는 훈련 데이터를 손쉽게 다양한 모델과 환경에서 사용할 수 있게 합니다.

이미지 라벨링 및 전처리 된 이미지들을 쉽게 얻을 수 있고 모델 학습 및 colab과의 연동이 잘 되어 있어 선택했습니다.

1. 이미지 라벨링

볼펜 이미지 라벨링(연습용)



ball detection

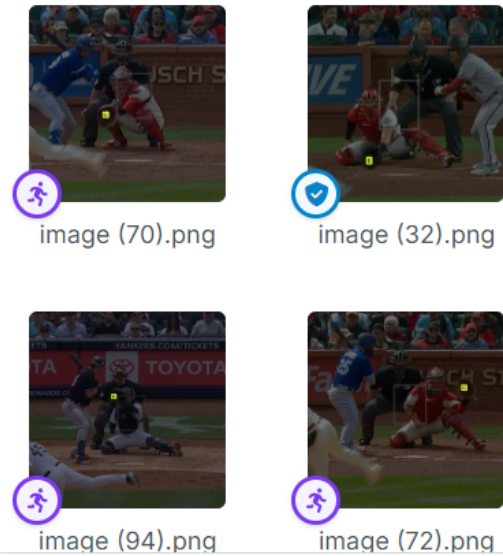
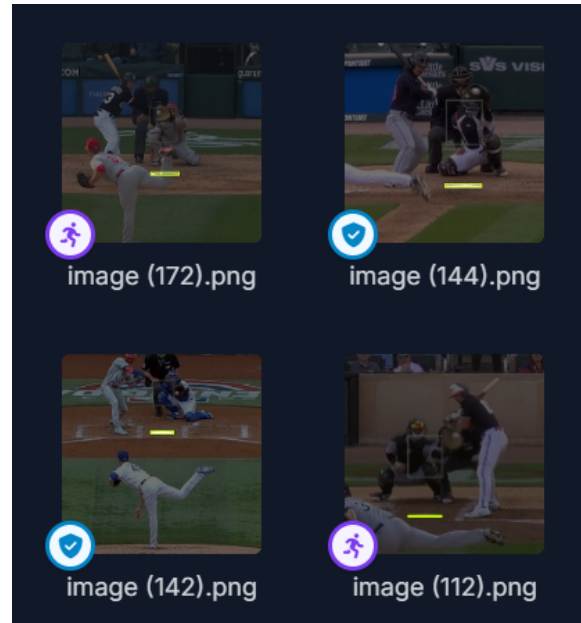


plate detection



2. 모델 학습

🔗 TRAIN VALID TEST

Training set:

The vast majority of your images will go here for training your model.

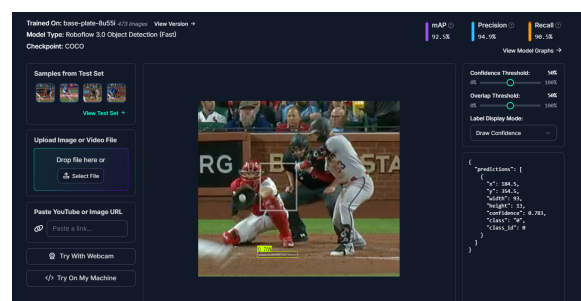
Valid set:

Images here will be used during training to test how well the model is doing in order to get feedback for improvement.

Test set:

After training is done, the test set is used to see how well the model performs on images it hasn't used for training. This gives you a better sense of how your model will perform in production.

For a deeper dive, [click here](#).





3. 성과

원본영상

<https://prod-files-secure.s3.us-west-2.amazonaws.com/53b4f7e6-e978-4f87-a3ae-476cb26d88d3/6adb7c63-d532-4061-883c-c8869f1cc7e2/baseball.mp4>

학습 영상 - 홈 베이스 인식 성공

https://prod-files-secure.s3.us-west-2.amazonaws.com/53b4f7e6-e978-4f87-a3ae-476cb26d88d3/bee39829-e68d-485a-8789-f7579a711b7a/bandicam_2024-10-07_01-12-07-330.mp4

단점

한 달에 3번만 학습할 수 있음.

유료 버전은 약 24만원이라 너무 비쌘.

그래서, 라벨링 된 이미지들을 다운 받아서 or 라벨링해서 colab에서 학습시킬 예정.

Setting and How to use

Colab에 yolo11을 다운받아 학습 할 예정.

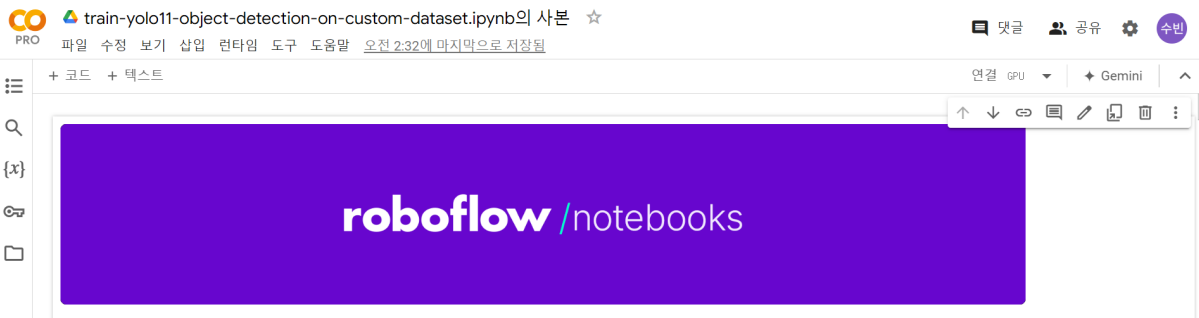
<https://colab.research.google.com/github/roboflow-ai/notebooks/blob/main/notebooks/train-yolo11-object-detection-on-custom-dataset.ipynb#scrollTo=oe9vkEvFABbN>

<https://discuss.pytorch.kr/t/4-yolov5/1835>

<https://velog.io/@seobbang/Object-Detection-1#초기-세팅>

Roboflow to Colab

colab pro 버전



▼ Setup

Configure API keys

To fine-tune YOLO11, you need to provide your Roboflow API key. Follow these steps:

- Go to your [Roboflow Settings](#) page. Click **Copy**. This will place your private key in the clipboard.
- In Colab, go to the left pane and click on **Secrets** (🔑). Store Roboflow API Key under the name `ROBOFLOW_API_KEY`.

▼ Before you start

Let's make sure that we have access to GPU. We can use `nvidia-smi` command to do that. In case of any problems navigate to **Edit** -> **Notebook settings** -> **Hardware accelerator**, set it to **GPU**, and then click **Save**.

```
[ ] !nvidia-smi
```

```
Tue Oct 1 13:03:44 2024
```

NVIDIA-SMI 535.104.05				Driver Version: 535.104.05				CUDA Version: 12.2			
GPU	Name	Perf	Persistence-M	Bus-Id	Disp.A	Volatile Uncorr. ECC	GPU-Util	Compute M.	MIG M.		
Fan	Temp	Perf	Pwr:Usage/Cap		Memory-Usage						
0	Tesla T4		Off	00000000:00:04:0	Off	0					
N/A	47C	P8	9W / 70W		0MiB / 15360MiB		0%	Default	N/A		

Processes:						
GPU	GI	CI	PID	Type	Process name	GPU Memory Usage
ID	ID	ID				
No running processes found						

NOTE: To make it easier for us to manage datasets, images and models we create a `HOME` constant.

▼ Install YOLO11 via Ultralytics

```
[ ] %!pip install ultralytics supervision roboflow
import ultralytics
ultralytics.checks()
```

Ultralytics 8.3.2 Python-3.10.12 torch-2.4.1+cu121 CUDA:0 (Tesla T4, 15102MiB)
Setup complete (2 CPUs, 12.7 GB RAM, 41.2/112.6 GB disk)

▼ Inference with model pre-trained on COCO dataset

▼ CLI

NOTE: CLI requires no customization or Python code. You can simply run all tasks from the terminal with the yolo command.

```
[ ] %!yolo task=detect mode=predict model=yolo11n.pt conf=0.25 source="https://media.roboflow.com/notebooks/examples/dog.jpeg" save=True

Downloading https://github.com/ultralytics/assets/releases/download/v8.3.0/yolo11n.pt to 'yolo11n.pt'...
100% 5.35M/5.35M [00:00<00:00, 95.9MB/s]
WARNING ⚠️ yolo11n.pt appears to require 'dill', which is not in Ultralytics requirements.
AutoInstall will run now for 'dill' but this feature will be removed in the future.
Recommend fixes are to train a new model using the latest 'ultralytics' package or to run a command with an official Ultralytics model, i.e. 'yolo predict model=yolo11n.pt'
requirements: Ultralytics requirement ['dill'] not found, attempting AutoUpdate...
Collecting dill
  Downloading dill-0.3.9-py3-none-any.whl.metadata (10 kB)
  Downloading dill-0.3.9-py3-none-any.whl (119 kB)
----- 119.4/119.4 kB 5.0 MB/s etc 0:00:00
Installing collected packages: dill
Successfully installed dill-0.3.9

requirements: AutoUpdate success 2.3s, installed 1 package: ['dill']
requirements: ⚠️ Restart runtime or rerun command for updates to take effect

Ultralytics 8.3.2 Python-3.10.12 torch-2.4.1+cu121 CUDA:0 (Tesla T4, 15102MiB)
YOLO11n summary (fused): 238 layers, 2,616,248 parameters, 0 gradients, 6.6 GFLOPs

Downloading https://media.roboflow.com/notebooks/examples/dog.jpeg to 'dog.jpeg'...
100% 104k/104k [00:00<00:00, 44.7MB/s]
image 1/1 /content/dog.jpeg: 640x384 2 persons, 1 car, 1 dog, 1 handbag, 61.4ms
Speed: 11.7ms preprocess, 61.4ms inference, 773.5ms postprocess per image at shape (1, 3, 640, 384)
Results saved to runs/detect/predict/
Learn more at https://docs.ultralytics.com/modes/predict
```

NOTE: Result annotated image got saved in {HOME}/runs/detect/predict/. Let's display it.

연동 방법 상세히 알려줍니다.

라즈베리파이 자료

<https://drive.google.com/drive/folders/1tEnPhItTB3SZzeyV5s9szH0X2CFPxKI5>

추가 구매 예정 물품

전체선택

선택상품 삭제

	주문상품	수량	상품금액	적립	납기	선택	배송비
<input type="checkbox"/>	 <div>Micro HDMI to HDMI 변환 케이블 [SZH-CAB16]</div>	<div>- 1 +</div>	2,000원	<div> 0원</div>	3~4일	<div>X 삭제</div>	
<input type="checkbox"/>	 <div>라즈베리파이5, 제로 카메라 어댑터 케이블 (22pin to 15pin) 15cm</div>	<div>- 1 +</div>	1,000원	<div> 0원</div>	3~4일	<div>X 삭제</div>	<div>본사</div> <div>롯데택배(선/착불)</div> <div>2,700원 (선불)</div> <div><div>변경</div></div>
<input type="checkbox"/>	 <div>라즈베리파이5, 제로 카메라 어댑터 케이블 (22pin to 15pin) 8cm</div>	<div>- 1 +</div>	800원	<div> 0원</div>	3~4일	<div>X 삭제</div>	
<input type="checkbox"/>	 <div>라즈베리파이5 FPC 카메라 케이블 200mm - 22P(0.5mm) to 15P(1mm)</div>	<div>- 1 +</div>	1,400원	<div> 0원</div>	1~2일	<div>X 삭제</div>	

상품 주문 금액

5,200원

+

부가세

520원

+

배송비

2,700원

=

결제 예정금액

8,420 원