C:\Users\Lenovo\AppData\Local\Programs\Python\Python310\python.exe E:\DroneDetection\yolov.py

王熠辉 2023213406

Ultralytics YOLOv8.2.29 🚀 Python-3.10.10 torch-2.3.1+cu118 CUDA:0 (NVIDIA GeForce RTX 4060 Laptop GPU, 8188MiB)

engine\trainer: task=detect, mode=train, model=yolov8n.yaml, data=data.yaml, epochs=10, time=None, patience=100, batch=16, imgsz=640, save=True, save\_period=-1, cache=False, device=None, workers=8, project=None, name=train5, exist\_ok=False, pretrained=True, optimizer=auto, verbose=True, seed=0, deterministic=True, single\_cls=False, rect=False, cos\_lr=False, close\_mosaic=10, resume=False, amp=True, fraction=1.0, profile=False, freeze=None, multi\_scale=False, overlap\_mask=True, mask\_ratio=4, dropout=0.0, val=True, split=val, save\_json=False, save\_hybrid=False, conf=None, iou=0.7, max\_det=300, half=False, dnn=False, plots=True, source=None, vid\_stride=1, stream\_buffer=False, visualize=False, augment=False, agnostic\_nms=False, classes=None, retina\_masks=False, embed=None, show=False, save\_frames=False, save\_txt=False, save\_conf=False, save\_crop=False, show\_labels=True, show\_conf=True, show\_boxes=True, line\_width=None, format=torchscript, keras=False, optimize=False, int8=False, dynamic=False, simplify=False, opset=None, workspace=4, nms=False, lr0=0.01, lrf=0.01, momentum=0.937, weight\_decay=0.0005, warmup\_epochs=3.0, warmup\_momentum=0.8, warmup\_bias\_lr=0.1, box=7.5, cls=0.5, dfl=1.5, pose=12.0, kobj=1.0, label\_smoothing=0.0, nbs=64, hsv\_h=0.015, hsv\_s=0.7, hsv\_v=0.4, degrees=0.0, translate=0.1, scale=0.5, shear=0.0, perspective=0.0, flipud=0.0, fliplr=0.5, bgr=0.0, mosaic=1.0, mixup=0.0, copy\_paste=0.0, auto\_augment=randaugment, erasing=0.4, crop\_fraction=1.0, cfg=None, tracker=botsort.yaml, save\_dir=runs\detect\train5

Overriding model.yaml nc=80 with nc=1

from n params module arguments

0 -1 1 464 ultralytics.nn.modules.conv.Conv [3, 16, 3, 2]

1 -1 1 4672 ultralytics.nn.modules.conv.Conv [16, 32, 3, 2]

2 -1 1 7360 ultralytics.nn.modules.block.C2f [32, 32, 1, True]

3 -1 1 18560 ultralytics.nn.modules.conv.Conv [32, 64, 3, 2]

4 -1 2 49664 ultralytics.nn.modules.block.C2f [64, 64, 2, True]

5 -1 1 73984 ultralytics.nn.modules.conv.Conv [64, 128, 3, 2]

6 -1 2 197632 ultralytics.nn.modules.block.C2f [128, 128, 2, True]

7 -1 1 295424 ultralytics.nn.modules.conv.Conv [128, 256, 3, 2]

8 -1 1 460288 ultralytics.nn.modules.block.C2f [256, 256, 1, True]

9 -1 1 164608 ultralytics.nn.modules.block.SPPF [256, 256, 5]

10 -1 1 0 torch.nn.modules.upsampling.Upsample [None, 2, 'nearest']

11 [-1, 6] 1 0 ultralytics.nn.modules.conv.Concat [1]

12 -1 1 148224 ultralytics.nn.modules.block.C2f [384, 128, 1]

13 -1 1 0 torch.nn.modules.upsampling.Upsample [None, 2, 'nearest']

14 [-1, 4] 1 0 ultralytics.nn.modules.conv.Concat [1]

15 -1 1 37248 ultralytics.nn.modules.block.C2f [192, 64, 1]

16 -1 1 36992 ultralytics.nn.modules.conv.Conv [64, 64, 3, 2]

17 [-1, 12] 1 0 ultralytics.nn.modules.conv.Concat [1]

18 -1 1 123648 ultralytics.nn.modules.block.C2f [192, 128, 1]

19 -1 1 147712 ultralytics.nn.modules.conv.Conv [128, 128, 3, 2]

20 [-1, 9] 1 0 ultralytics.nn.modules.conv.Concat [1]

21 -1 1 493056 ultralytics.nn.modules.block.C2f [384, 256, 1]

22 [15, 18, 21] 1 751507 ultralytics.nn.modules.head.Detect [1, [64, 128, 256]]

YOLOv8n summary: 225 layers, 3011043 parameters, 3011027 gradients, 8.2 GFLOPs

TensorBoard: Start with 'tensorboard --logdir runs\detect\train5', view at http://localhost:6006/

Freezing layer 'model.22.dfl.conv.weight'

AMP: running Automatic Mixed Precision (AMP) checks with YOLOv8n...

AMP: checks passed ✅

train: Scanning E:\DroneDetection\train\labels.cache... 20256 images, 189 backgrounds, 0 corrupt: 100%|██████████| 20256/20256 [00:00<?, ?it/s]

train: WARNING ⚠️ E:\DroneDetection\train\images\pic\_518\_jpg.rf.7eb643482bea3c7d07ef3c81e96bdbf4.jpg: 1 duplicate labels removed

train: WARNING ⚠️ E:\DroneDetection\train\images\pic\_518\_jpg.rf.bfc8f0a655bf1592347e2d5f5b7d5564.jpg: 1 duplicate labels removed

train: WARNING ⚠️ E:\DroneDetection\train\images\pic\_518\_jpg.rf.cad8f4dc2f20c1d2691ac67c22536de2.jpg: 1 duplicate labels removed

val: Scanning E:\DroneDetection\valid\labels.cache... 1679 images, 3 backgrounds, 0 corrupt: 100%|██████████| 1679/1679 [00:00<?, ?it/s]

Plotting labels to runs\detect\train5\labels.jpg...

optimizer: 'optimizer=auto' found, ignoring 'lr0=0.01' and 'momentum=0.937' and determining best 'optimizer', 'lr0' and 'momentum' automatically...

optimizer: AdamW(lr=0.002, momentum=0.9) with parameter groups 57 weight(decay=0.0), 64 weight(decay=0.0005), 63 bias(decay=0.0)

TensorBoard: model graph visualization added ✅

Image sizes 640 train, 640 val

Using 8 dataloader workers

Logging results to runs\detect\train5

Starting training for 10 epochs...

Closing dataloader mosaic

Epoch GPU\_mem box\_loss cls\_loss dfl\_loss Instances Size

1/10 2.2G 2.599 3.462 3.134 16 640: 100%|██████████| 1266/1266 [02:18<00:00, 9.15it/s]

Class Images Instances Box(P R mAP50 mAP50-95): 100%|██████████| 53/53 [00:06<00:00, 8.26it/s]

all 1679 1795 0.4 0.319 0.264 0.0971

Epoch GPU\_mem box\_loss cls\_loss dfl\_loss Instances Size

2/10 2.08G 2.044 2.031 2.296 16 640: 100%|██████████| 1266/1266 [02:07<00:00, 9.93it/s]

Class Images Instances Box(P R mAP50 mAP50-95): 100%|██████████| 53/53 [00:05<00:00, 9.27it/s]

all 1679 1795 0.559 0.464 0.513 0.239

Epoch GPU\_mem box\_loss cls\_loss dfl\_loss Instances Size

3/10 2.08G 1.903 1.743 2.131 16 640: 100%|██████████| 1266/1266 [02:05<00:00, 10.12it/s]

Class Images Instances Box(P R mAP50 mAP50-95): 100%|██████████| 53/53 [00:05<00:00, 9.32it/s]

all 1679 1795 0.706 0.521 0.607 0.307

Epoch GPU\_mem box\_loss cls\_loss dfl\_loss Instances Size

4/10 2.08G 1.804 1.538 2.029 16 640: 100%|██████████| 1266/1266 [02:04<00:00, 10.19it/s]

Class Images Instances Box(P R mAP50 mAP50-95): 100%|██████████| 53/53 [00:05<00:00, 9.36it/s]

all 1679 1795 0.798 0.704 0.785 0.435

Epoch GPU\_mem box\_loss cls\_loss dfl\_loss Instances Size

5/10 2.08G 1.725 1.392 1.936 15 640: 100%|██████████| 1266/1266 [02:04<00:00, 10.17it/s]

Class Images Instances Box(P R mAP50 mAP50-95): 100%|██████████| 53/53 [00:05<00:00, 9.47it/s]

all 1679 1795 0.803 0.715 0.791 0.449

Epoch GPU\_mem box\_loss cls\_loss dfl\_loss Instances Size

6/10 2.08G 1.664 1.274 1.876 17 640: 100%|██████████| 1266/1266 [02:04<00:00, 10.16it/s]

Class Images Instances Box(P R mAP50 mAP50-95): 100%|██████████| 53/53 [00:05<00:00, 9.44it/s]

all 1679 1795 0.842 0.781 0.837 0.489

Epoch GPU\_mem box\_loss cls\_loss dfl\_loss Instances Size

7/10 2.08G 1.606 1.173 1.825 18 640: 100%|██████████| 1266/1266 [02:03<00:00, 10.22it/s]

Class Images Instances Box(P R mAP50 mAP50-95): 100%|██████████| 53/53 [00:05<00:00, 9.51it/s]

all 1679 1795 0.837 0.806 0.866 0.514

Epoch GPU\_mem box\_loss cls\_loss dfl\_loss Instances Size

8/10 2.08G 1.565 1.092 1.787 17 640: 100%|██████████| 1266/1266 [02:04<00:00, 10.20it/s]

Class Images Instances Box(P R mAP50 mAP50-95): 100%|██████████| 53/53 [00:05<00:00, 9.58it/s]

all 1679 1795 0.871 0.817 0.886 0.536

0%| | 0/1266 [00:00<?, ?it/s]

Epoch GPU\_mem box\_loss cls\_loss dfl\_loss Instances Size

9/10 2.08G 1.513 1.024 1.732 17 640: 100%|██████████| 1266/1266 [02:04<00:00, 10.18it/s]

Class Images Instances Box(P R mAP50 mAP50-95): 100%|██████████| 53/53 [00:05<00:00, 9.54it/s]

all 1679 1795 0.86 0.846 0.889 0.549

0%| | 0/1266 [00:00<?, ?it/s]

Epoch GPU\_mem box\_loss cls\_loss dfl\_loss Instances Size

10/10 2.08G 1.466 0.9705 1.693 16 640: 100%|██████████| 1266/1266 [02:04<00:00, 10.20it/s]

Class Images Instances Box(P R mAP50 mAP50-95): 100%|██████████| 53/53 [00:05<00:00, 9.53it/s]

all 1679 1795 0.883 0.858 0.903 0.573

10 epochs completed in 0.371 hours.

Optimizer stripped from runs\detect\train5\weights\last.pt, 6.2MB

Optimizer stripped from runs\detect\train5\weights\best.pt, 6.2MB

Validating runs\detect\train5\weights\best.pt...

Ultralytics YOLOv8.2.29 🚀 Python-3.10.10 torch-2.3.1+cu118 CUDA:0 (NVIDIA GeForce RTX 4060 Laptop GPU, 8188MiB)

YOLOv8n summary (fused): 168 layers, 3005843 parameters, 0 gradients, 8.1 GFLOPs

Class Images Instances Box(P R mAP50 mAP50-95): 100%|██████████| 53/53 [00:05<00:00, 9.29it/s]

all 1679 1795 0.883 0.858 0.903 0.573

Speed: 0.1ms preprocess, 1.0ms inference, 0.0ms loss, 0.5ms postprocess per image

Results saved to runs\detect\train5

Ultralytics YOLOv8.2.29 🚀 Python-3.10.10 torch-2.3.1+cu118 CUDA:0 (NVIDIA GeForce RTX 4060 Laptop GPU, 8188MiB)

YOLOv8n summary (fused): 168 layers, 3005843 parameters, 0 gradients, 8.1 GFLOPs

val: Scanning E:\DroneDetection\valid\labels.cache... 1679 images, 3 backgrounds, 0 corrupt: 100%|██████████| 1679/1679 [00:00<?, ?it/s]

Class Images Instances Box(P R mAP50 mAP50-95): 100%|██████████| 105/105 [00:08<00:00, 12.91it/s]

all 1679 1795 0.883 0.859 0.903 0.573

Speed: 0.2ms preprocess, 2.1ms inference, 0.0ms loss, 0.5ms postprocess per image

Results saved to runs\detect\train52

image 1/1 E:\DroneDetection\valid\images\1-10-\_jpeg.rf.86e12c0f6fdf687c1bb073423017a026.jpg: 640x640 1 drone, 3.0ms

Speed: 2.0ms preprocess, 3.0ms inference, 1.0ms postprocess per image at shape (1, 3, 640, 640)

Ultralytics YOLOv8.2.29 🚀 Python-3.10.10 torch-2.3.1+cu118 CPU (13th Gen Intel Core(TM) i9-13900HX)

PyTorch: starting from 'runs\detect\train5\weights\best.pt' with input shape (1, 3, 640, 640) BCHW and output shape(s) (1, 5, 8400) (5.9 MB)

TorchScript: starting export with torch 2.3.1+cu118...

TorchScript: export success ✅ 1.2s, saved as 'runs\detect\train5\weights\best.torchscript' (11.9 MB)

Export complete (3.0s)

Results saved to E:\DroneDetection\runs\detect\train5\weights

Predict: yolo predict task=detect model=runs\detect\train5\weights\best.torchscript imgsz=640

Validate: yolo val task=detect model=runs\detect\train5\weights\best.torchscript imgsz=640 data=data.yaml

Visualize: https://netron.app

王熠辉 2023213406

进程已结束，退出代码为 0