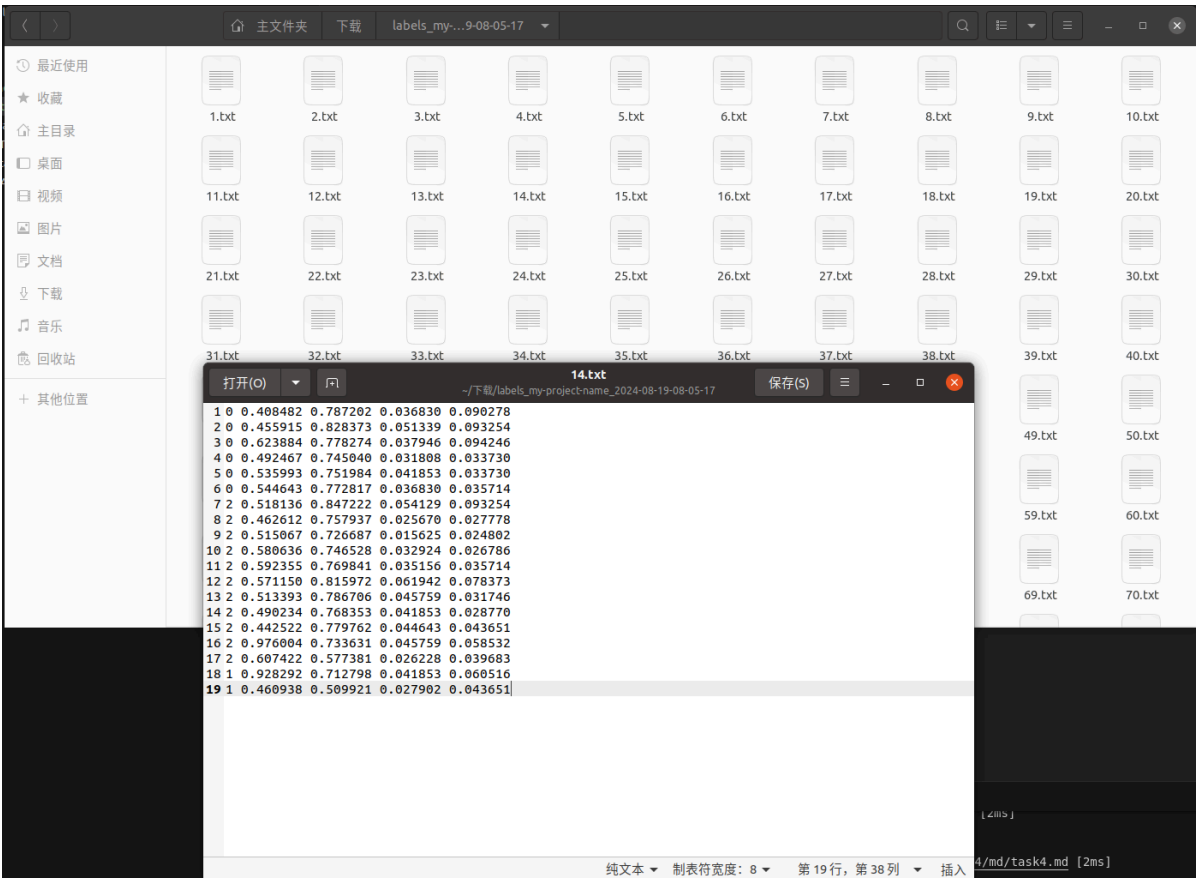
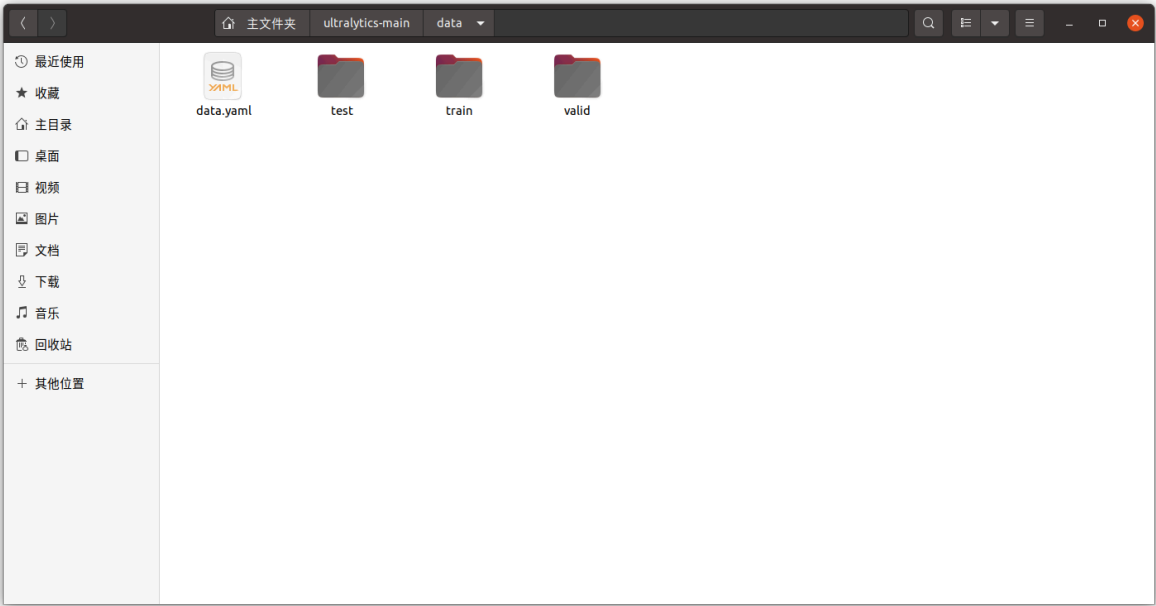


yolo8训练过程

使用make sense对给定图片进行标注，得到标注文件。



新建data目录，对标记文件及原图片进行划分，分为test, train, valid



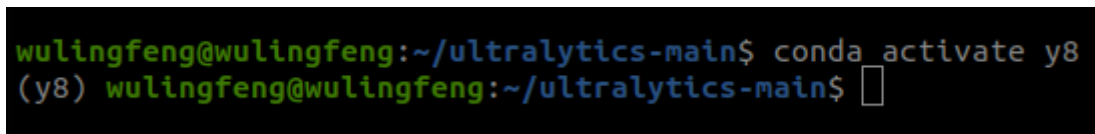
编写yaml文件



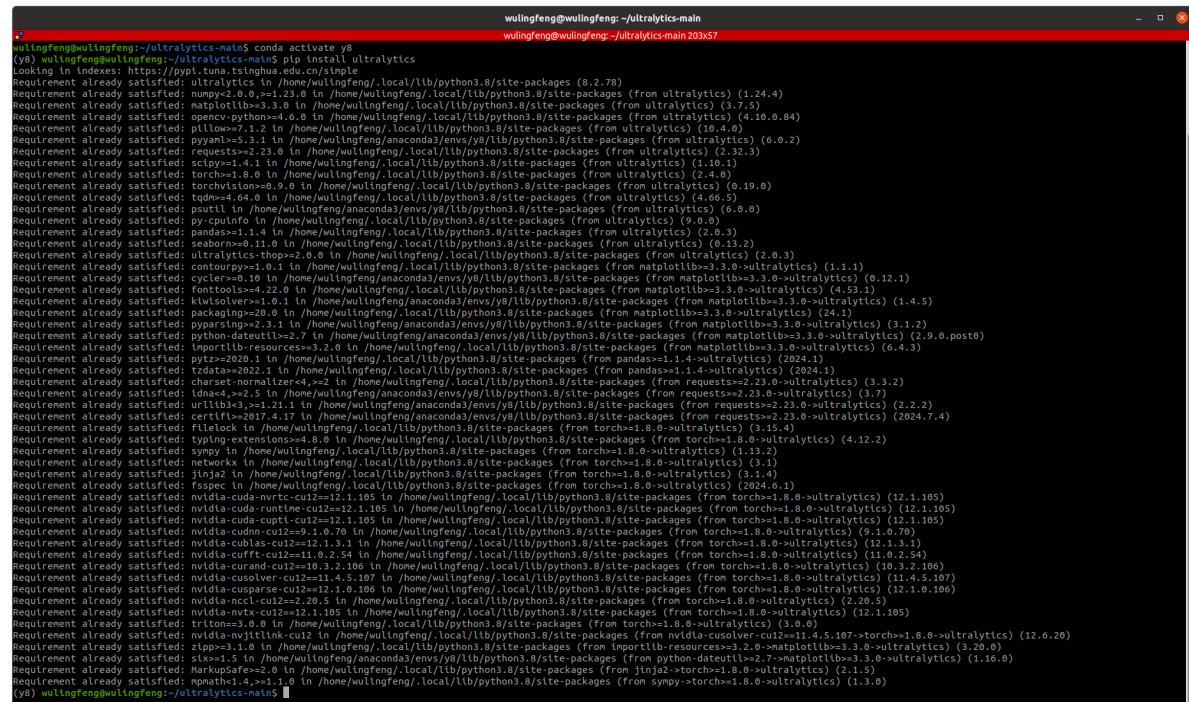
创建虚拟环境

conda create -n y8 python=3.8

进入虚拟环境



安装软件包



获取预训练模型下载地址前往github镜像下载

测试yolo运行情况

```
wulingfeng@wulingfeng: ~/ultralytics-main
wulingfeng@wulingfeng: ~/ultralytics-main 98x23

s (from torch>=1.8.0->ultralytics) (3.0.0)
Requirement already satisfied: nvidia-nvjitlink-cu12 in /home/wulingfeng/.local/lib/python3.8/site-packages (from nvidia-cusolver-cu12==11.4.5.107->torch>=1.8.0->ultralytics) (12.6.20)
Requirement already satisfied: zipp>=3.1.0 in /home/wulingfeng/.local/lib/python3.8/site-packages (from importlib-resources>=3.2.0->matplotlib>=3.3.0->ultralytics) (3.20.0)
Requirement already satisfied: six>=1.5 in /home/wulingfeng/anaconda3/envs/y8/lib/python3.8/site-packages (from python-dateutil>=2.7->matplotlib>=3.3.0->ultralytics) (1.16.0)
Requirement already satisfied: MarkupSafe>=2.0 in /home/wulingfeng/.local/lib/python3.8/site-packages (from jinja2->torch>=1.8.0->ultralytics) (2.1.5)
Requirement already satisfied: mpmath<1.4, >=1.1.0 in /home/wulingfeng/.local/lib/python3.8/site-packages (from sympy->torch>=1.8.0->ultralytics) (1.3.0)
(y8) wulingfeng@wulingfeng:~/ultralytics-main$ yolo predict model=yolov8n.pt source='ultralytics/assets/bus.jpg' device=0
Ultralytics YOLOv8.2.78 🚀 Python-3.8.10 torch-2.4.0+cu121 CUDA:0 (NVIDIA GeForce RTX 4060 Laptop GPU, 7918MiB)
YOLOv8n summary (fused): 168 layers, 3,151,904 parameters, 0 gradients, 8.7 GFLOPs

image 1/1 /home/wulingfeng/ultralytics-main/ultralytics/assets/bus.jpg: 640x480 4 persons, 1 bus, 1 stop sign, 39.9ms
Speed: 2.3ms preprocess, 39.9ms inference, 219.5ms postprocess per image at shape (1, 3, 640, 480)
Results saved to runs/detect/predict2
💡 Learn more at https://docs.ultralytics.com/modes/predict
(y8) wulingfeng@wulingfeng:~/ultralytics-main$
```

开始训练

参数:

轮数: 100

图片大小: 640

单轮投入数量: 40

设备: gpu0

```
wulingfeng@wulingfeng: ~/ultralytics-main
wulingfeng@wulingfeng: ~/ultralytics-main 214x67

(y8) wulingfeng@wulingfeng:~/ultralytics-main$ yolo train data=data.yaml model=yolov8n.pt epochs=100 imgsz=640 batch=40 workers=0 device=0
Ultralytics YOLOv8.2.78 🚀 Python-3.8.10 torch-2.4.0+cu121 CUDA:0 (NVIDIA GeForce RTX 4060 Laptop GPU, 7918MiB)
engine/trainer: task=detect, mode=train, model=yolov8n.pt, data=data.yaml, epochs=100, imgsz=640, batch=40, workers=0, project=None, name=train, 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_masks=True, mask_ratio=0.0, dropout=0.0, val=True, split_val=True, save_json=False, save_hybrid=False, conf=None, iou=0.7, max_det=300, half=False, dnn=False, plots=True, source=0, one_vd_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, lr=0.01, lrf=0.01, momentum=0.937, weight_decay=0.0005, warmup_epochs=3.0, warmup_momentum=0.0, 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, track=er-botort.yaml, save_dir=runs/detect/train3
Overriding model.yaml nc=80 with nc=3

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      15808    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.upstreaming.UpSample [None, 2, 'nearest']
11     [-1, 0] 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.upstreaming.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      754897   ultralytics.nn.modules.head.Detect      [3, [64, 128, 256]]

Model summary: 225 layers, 3,011,433 parameters, 3,011,417 gradients, 8.2 GFLOPs

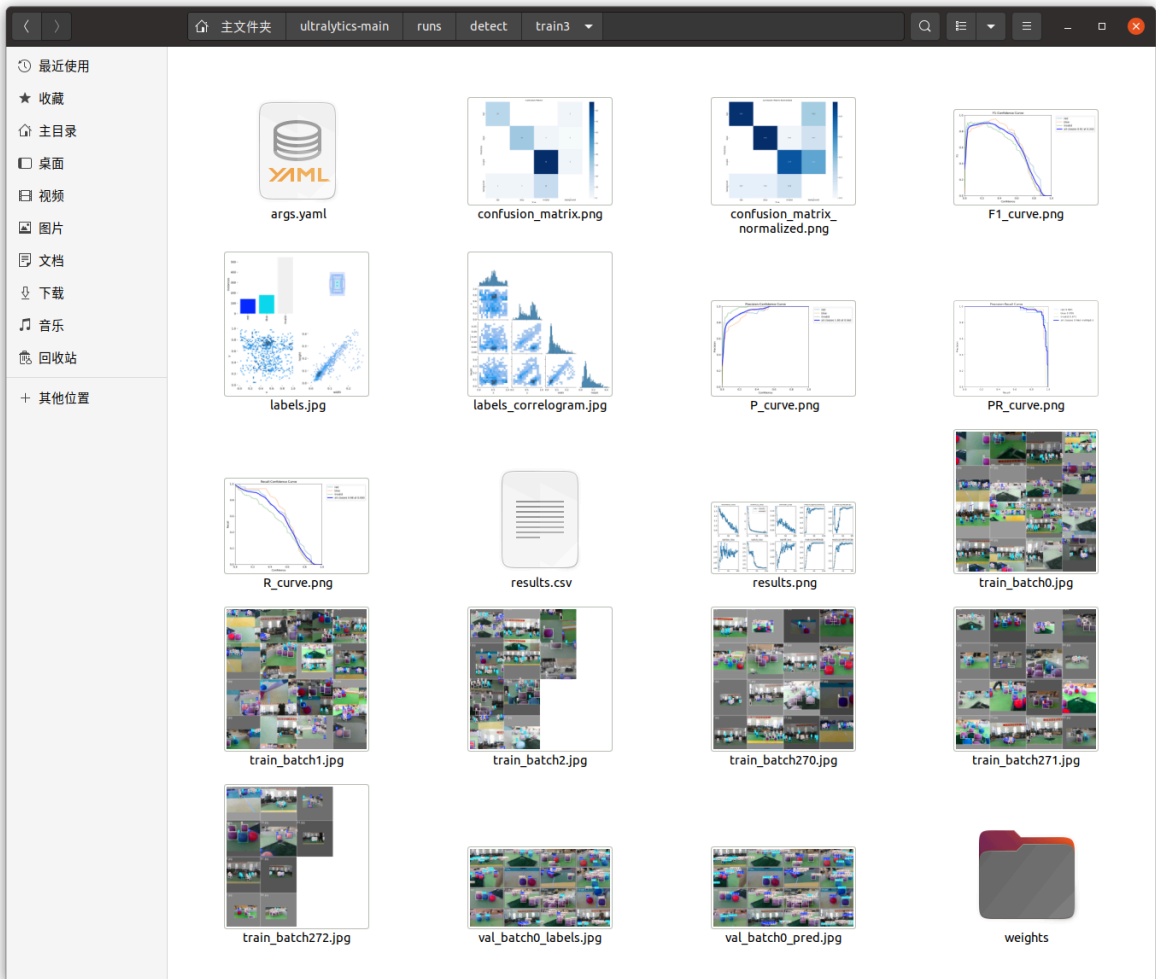
Transferred 319/355 items from pretrained weights
Freezing layer 'model.22.dfl.conv.weight'
AMP: running Automatic Mixed Precision (AMP) checks with YOLOv8n...
AMP: checks passed
/home/wulingfeng/.local/lib/python3.8/site-packages/ultralytics/engine/trainer.py:271: FutureWarning: 'torch.cuda.amp.GradScaler(args...)' is deprecated. Please use 'torch.amp.GradScaler('cuda', args...)' instead.
  self.scaler = torch.cuda.amp.GradScaler(enabled=self.amp)
train: Scanning /home/wulingfeng/ultralytics-main/data/train/labels.cache... 98 images, 0 backgrounds, 0 corrupt: 100% ██████████ 98/90 [00:00<, 71t/s]
val: Scanning /home/wulingfeng/ultralytics-main/data/val/labels.cache... 20 images, 0 backgrounds, 0 corrupt: 100% ██████████ 20/20 [00:00<, 71t/s]
Plotting labels to runs/detect/train3/labels.jpg...
optimizer: 'optimizer=auto' found, ignoring 'lr=0.01' and 'momentum=0.937' and determining best 'optimizer', 'lr' and 'momentum' automatically...
optimizer: AdamW(lr=0.00129, momentum=0.9) with parameter groups 57 weight(decay=0.0), 64 weight(decay=0.00025), 63 bias(decay=0.0)
Image sizes 640 train, 640 val
Using 0 dataloader workers
Logging results to runs/detect/train3
Starting training for 100 epochs...

Epoch      GPU_mem  box_loss  cls_loss  dfl_loss  Instances  Size      MAP50  MAP50-95
1/100      5.28G    1.378     3.829     1.184     176        640: 100% ██████████ 3/3 [00:01<00:00, 1.66t/s]
Class      Images  Instances  Box(P)    R      MAP50  MAP50-95
all        20       172       0.0118    0.402  0.0135  0.00947

Epoch      GPU_mem  box_loss  cls_loss  dfl_loss  Instances  Size      MAP50  MAP50-95
2/100      5.4G     1.334     3.734     1.186     103        640: 100% ██████████ 3/3 [00:01<00:00, 2.86t/s]
Class      Images  Instances  Box(P)    R      MAP50  MAP50-95
all        20       172       0.0134    0.452  0.0245  0.0176

Epoch      GPU_mem  box_loss  cls_loss  dfl_loss  Instances  Size      MAP50  MAP50-95
3/100      5.19G    1.289     3.522     1.105     176        640: 100% ██████████ 3/3 [00:01<00:00, 2.87t/s]
Class      Images  Instances  Box(P)    R      MAP50  MAP50-95
all        20       172       0.0105    0.704  0.0096  0.0111
```

训练结果



```
wulingfeng@wulingfeng: ~/ultralytics-main
wulingfeng@wulingfeng: ~/ultralytics-main 70x25
(y8) wulingfeng@wulingfeng:~/ultralytics-main$ yolo task=detect mode=val split=val model=runs/detect/train/weights/best.pt data=data/data.yaml
Ultralytics YOLOv8.2.78 🚀 Python-3.8.10 torch-2.4.0+cu121 CUDA:0 (NVIDIA GeForce RTX 4060 Laptop GPU, 7918MiB)
Model summary (fused): 168 layers, 3,006,233 parameters, 0 gradients, 8.1 GFLOPs
val: Scanning /home/wulingfeng/ultralytics-main/data/valid/labels.cache... 20 images, 0 backgrounds, 0 corrupt: 100%|██████████| 20/20 [00:00<00:00, 3.20it/s]
0.964 0.685
0.965 0.707
0.956 0.722
0.972 0.624
Speed: 1.8ms preprocess, 13.4ms inference, 0.0ms loss, 10.4ms postprocess per image
Results saved to runs/detect/val3
💡 Learn more at https://docs.ultralytics.com/modes/val
(y8) wulingfeng@wulingfeng:~/ultralytics-main$
```

