

CLI use

Note: Using the Docker container in the factory image does not require re-setting up the environment. The environment is already set up. Simply enter Docker and run the corresponding function commands according to the previous tutorial.

1. Download the Source Code

 If you are using the Docker container in the factory image, you do not need to download this step and can skip it.

```
git clone https://github.com/ultralytics/ultralytics.git
```

2. Using the CLI for Prediction

A command-line interface (CLI) is a way for users to interact with a computer or software program by typing text commands to run a program or perform tasks, rather than clicking icons or buttons through a graphical user interface (GUI).

2.1. CLI Syntax

```
yolo TASK MODE ARGS
```

where `TASK` (optional) is one of [detect, segment, classify, pose, obb]
`MODE` (required) is one of [train, val, predict, export, track, benchmark]
`ARGS` (optional) are any number of custom 'arg=value' pairs like '`imgsz=320`' that override defaults.

2.2 Image Prediction

Use `yolo11n.pt` to predict images included with the Ultralytics project. If the system doesn't find the corresponding model file in the directory where you run the command, it will automatically download it. (If the download fails, you can copy the model file into the directory.)

Go to the project folder:

```
cd ~/ultralytics/ultralytics
```

Use `yolo11n.pt` to detect images in the target folder and output the results:

```
# The image path can be customized to your own image.  
yolo predict model=yolo11n source='/root/ultralytics/ultralytics/assets/bus.jpg'
```

```
root@raspberrypi:~/ultralytics/ultralytics# yolo predict model=yolo11n source='/root/ultralytics/ultralytics/assets/bus.jpg'  
Ultralytics 8.3.154 Python-3.10.12 torch-2.1.2 CPU (Cortex-A76)  
YOLOv11n summary (fused): 100 layers, 2,616,248 parameters, 0 gradients, 6.5 GFLOPs  
  
image 1/1 /root/ultralytics/ultralytics/assets/bus.jpg: 640x480 4 persons, 1 bus, 537.2ms  
Speed: 15.1ms preprocess, 537.2ms inference, 27.2ms postprocess per image at shape (1, 3, 640, 480)  
Results saved to runs/detect/predict3  
Learn more at https://docs.ultralytics.com/modes/predict  
root@raspberrypi:~/ultralytics/ultralytics#
```

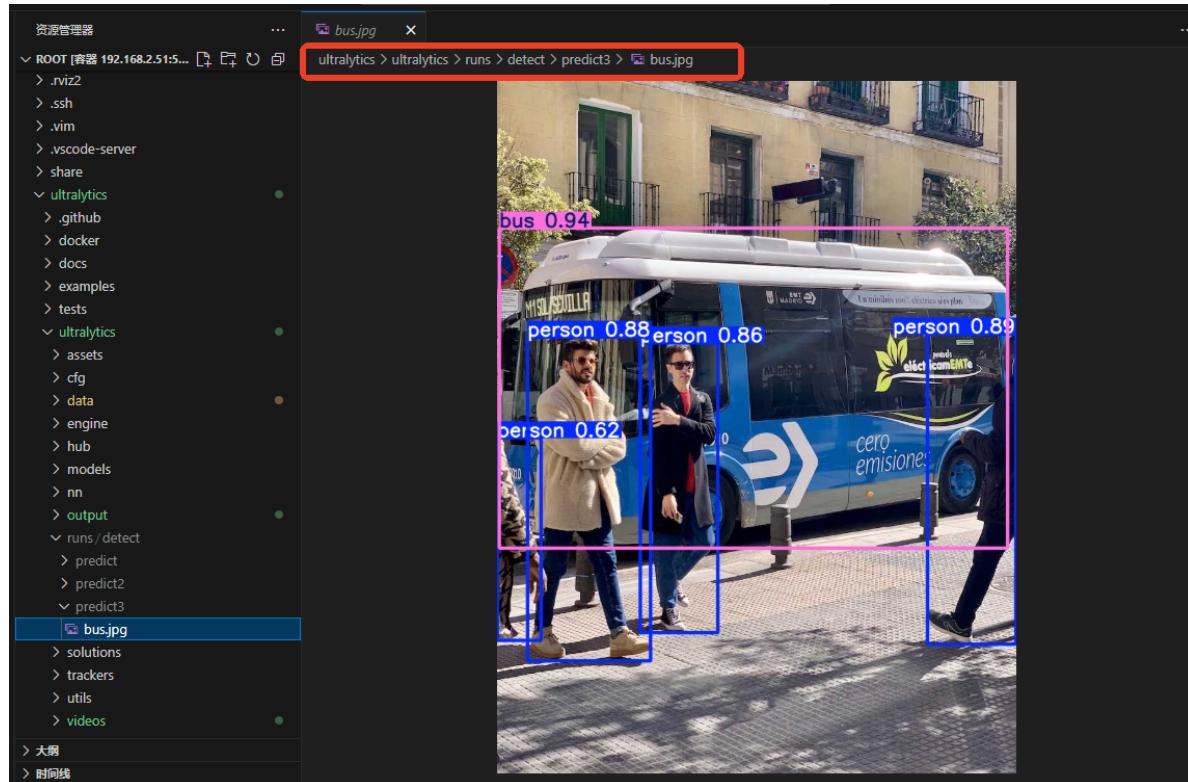
If the image above appears, the prediction is successful.

Preview

Yolo recognizes the output video location.

```
/root/ultralytics/ultralytics/runs/detect
```

With each run, the predict value in this folder automatically increments by 1.



2.3 Video Prediction

Use yolo11n.pt to predict videos in the Ultralytics project (not included with Ultralytics): If the system doesn't find the corresponding model file in the directory where you run the command, it will automatically download it. (If it can't download, you can copy the model into the directory.)

Go to the project folder:

```
cd ~/ultralytics/ultralytics
```

Use yolo11n.pt to detect videos in the target folder and output the results:

```
# The video path can be customized.  
yolo predict model=yolo11n  
source='/root/ultralytics/ultralytics/videos/people_animals.mp4'
```

```

video 1/1 (frame 65/95) /root/ultralytics/ultralytics/videos/people_animals.mp4: 384x640 2 persons, 2 dogs, 392.9ms
video 1/1 (frame 66/95) /root/ultralytics/ultralytics/videos/people_animals.mp4: 384x640 2 persons, 2 dogs, 426.7ms
video 1/1 (frame 67/95) /root/ultralytics/ultralytics/videos/people_animals.mp4: 384x640 2 persons, 2 dogs, 393.1ms
video 1/1 (frame 68/95) /root/ultralytics/ultralytics/videos/people_animals.mp4: 384x640 2 persons, 2 dogs, 1 sheep, 388.5ms
video 1/1 (frame 69/95) /root/ultralytics/ultralytics/videos/people_animals.mp4: 384x640 2 persons, 2 dogs, 391.3ms
video 1/1 (frame 70/95) /root/ultralytics/ultralytics/videos/people_animals.mp4: 384x640 2 persons, 2 dogs, 1 sheep, 387.0ms
video 1/1 (frame 71/95) /root/ultralytics/ultralytics/videos/people_animals.mp4: 384x640 2 persons, 2 dogs, 395.9ms
video 1/1 (frame 72/95) /root/ultralytics/ultralytics/videos/people_animals.mp4: 384x640 2 persons, 2 dogs, 1 sheep, 391.6ms
video 1/1 (frame 73/95) /root/ultralytics/ultralytics/videos/people_animals.mp4: 384x640 2 persons, 2 dogs, 390.3ms
video 1/1 (frame 74/95) /root/ultralytics/ultralytics/videos/people_animals.mp4: 384x640 2 persons, 2 dogs, 1 sheep, 404.9ms
video 1/1 (frame 75/95) /root/ultralytics/ultralytics/videos/people_animals.mp4: 384x640 2 persons, 2 dogs, 430.7ms
video 1/1 (frame 76/95) /root/ultralytics/ultralytics/videos/people_animals.mp4: 384x640 2 persons, 2 dogs, 385.7ms
video 1/1 (frame 77/95) /root/ultralytics/ultralytics/videos/people_animals.mp4: 384x640 2 persons, 2 dogs, 1 sheep, 389.8ms
video 1/1 (frame 78/95) /root/ultralytics/ultralytics/videos/people_animals.mp4: 384x640 2 persons, 2 dogs, 386.8ms
video 1/1 (frame 79/95) /root/ultralytics/ultralytics/videos/people_animals.mp4: 384x640 2 persons, 2 dogs, 406.6ms
video 1/1 (frame 80/95) /root/ultralytics/ultralytics/videos/people_animals.mp4: 384x640 2 persons, 3 dogs, 398.1ms
video 1/1 (frame 81/95) /root/ultralytics/ultralytics/videos/people_animals.mp4: 384x640 2 persons, 3 dogs, 382.9ms
video 1/1 (frame 82/95) /root/ultralytics/ultralytics/videos/people_animals.mp4: 384x640 2 persons, 2 dogs, 2 sheep, 389.7ms
video 1/1 (frame 83/95) /root/ultralytics/ultralytics/videos/people_animals.mp4: 384x640 2 persons, 2 dogs, 390.3ms
video 1/1 (frame 84/95) /root/ultralytics/ultralytics/videos/people_animals.mp4: 384x640 2 persons, 2 dogs, 418.4ms
video 1/1 (frame 85/95) /root/ultralytics/ultralytics/videos/people_animals.mp4: 384x640 2 persons, 3 dogs, 399.1ms
video 1/1 (frame 86/95) /root/ultralytics/ultralytics/videos/people_animals.mp4: 384x640 2 persons, 3 dogs, 397.0ms
video 1/1 (frame 87/95) /root/ultralytics/ultralytics/videos/people_animals.mp4: 384x640 2 persons, 3 dogs, 421.1ms
video 1/1 (frame 88/95) /root/ultralytics/ultralytics/videos/people_animals.mp4: 384x640 2 persons, 3 dogs, 385.1ms
video 1/1 (frame 89/95) /root/ultralytics/ultralytics/videos/people_animals.mp4: 384x640 2 persons, 3 dogs, 390.5ms
video 1/1 (frame 91/95) /root/ultralytics/ultralytics/videos/people_animals.mp4: 384x640 2 persons, 2 dogs, 370.0ms
video 1/1 (frame 92/95) /root/ultralytics/ultralytics/videos/people_animals.mp4: 384x640 2 persons, 2 dogs, 412.2ms
video 1/1 (frame 93/95) /root/ultralytics/ultralytics/videos/people_animals.mp4: 384x640 2 persons, 2 dogs, 392.7ms
Video 1/1 (frame 94/95) /root/ultralytics/ultralytics/videos/people_animals.mp4: 384x640 2 persons, 2 dogs, 392.2ms
Video 1/1 (frame 95/95) /root/ultralytics/ultralytics/videos/people_animals.mp4: 384x640 2 persons, 2 dogs, 399.3ms
Speed: 6.2ms preprocess, 399.4ms inference, 1.5ms postprocess per image at shape (1, 3, 384, 640)
Results saved to runs/detect/predict4
    [learn more at https://docs.ultralytics.com/nodes/predict4
root@raspberrypi:~$
```

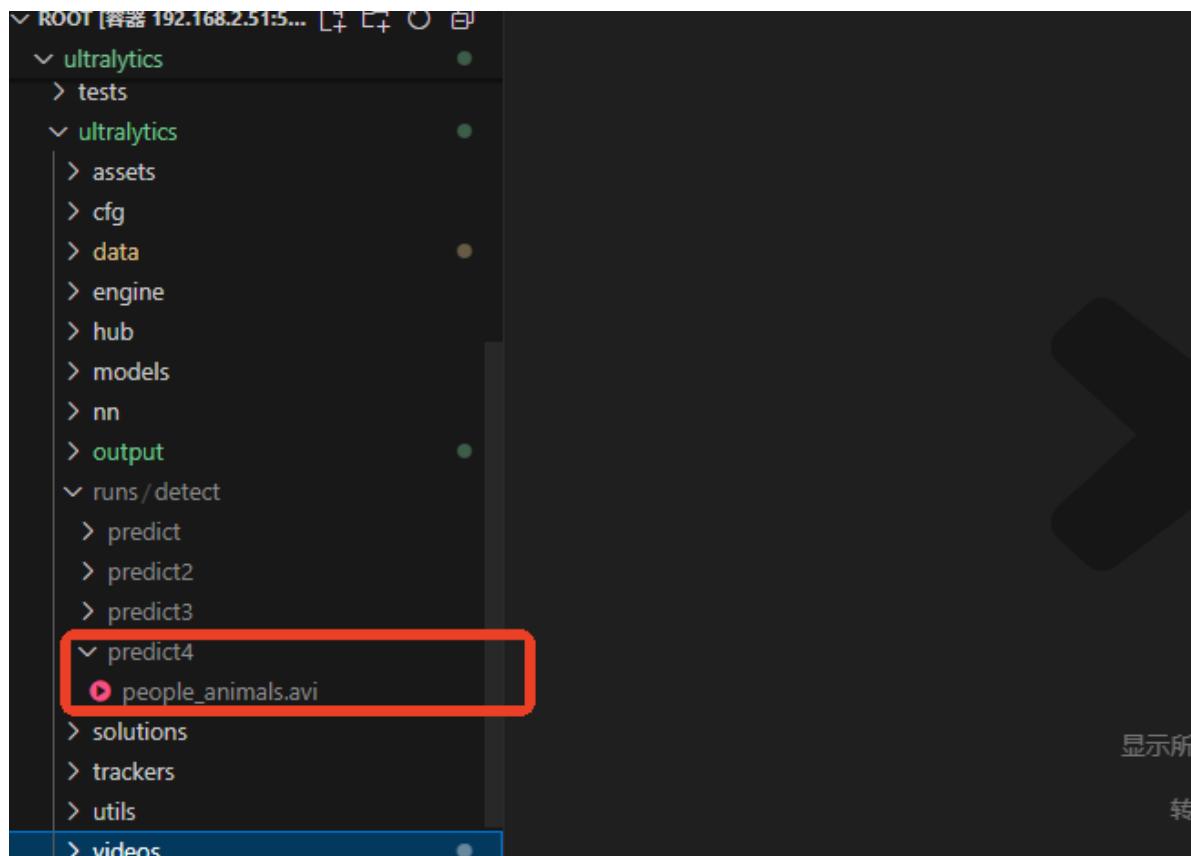
The above image indicates a successful prediction.

Preview

Yolo recognizes the output video location.

```
/root/ultralytics/ultralytics/runs/detect
```

The prediction value in this folder automatically increments by 1 with each run.



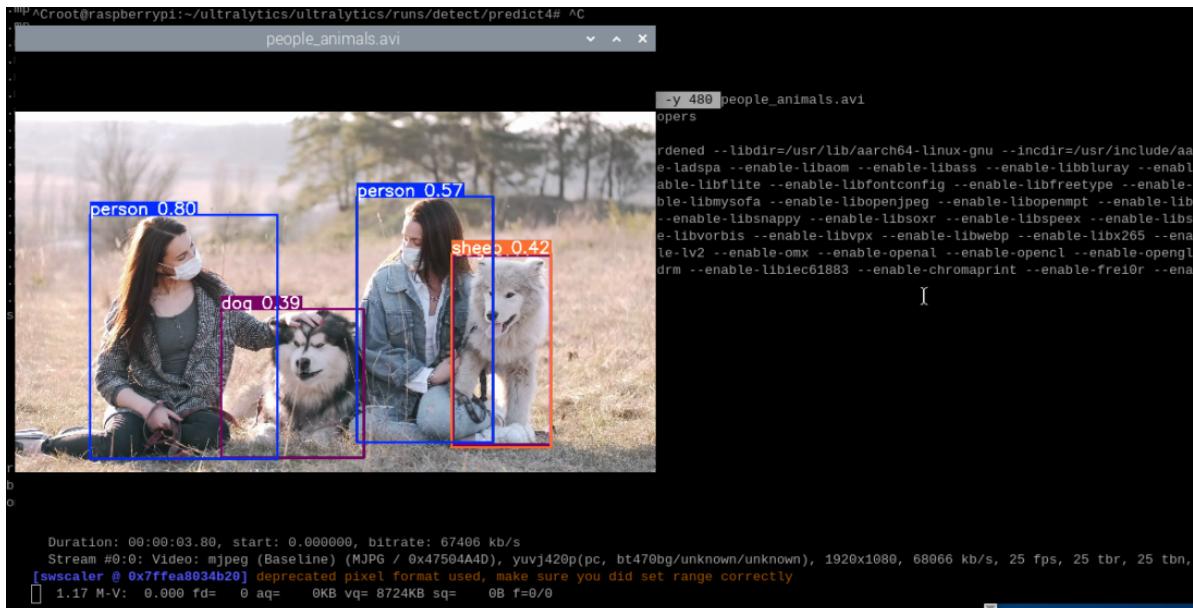
You can use ffmpeg to view the video. Install it using the following command:

```

sudo apt update
sudo apt install ffmpeg -y
```

Play the video:

```
# You need to navigate to the corresponding path, here it's the predict4 folder
containing people_animals.avi
cd /root/ultralytics/ultralytics/runs/detect/predict4/
# Play the video
ffplay -x 640 -y 480 people_animals.avi
```



2.4. Real-time Prediction

⚠ This feature only supports USB cameras; depth cameras are not supported by the CLI.

Use yolo11n.pt to predict the USB camera image. If the system does not find the corresponding model file in the directory where the command is run, it will automatically download it.

Go to the project folder:

```
cd ~/ultralytics/ultralytics
```

Use yolo11n.pt to detect the camera image and output the results.

```
yolo predict model=yolo11n.pt source=0 save=False show # Object Detection
# Instance Segmentation: yolo predict model=yolo11n-seg.pt source=0 save=False
show
# Image Classification: yolo predict model=yolo11n-clss.pt source=0 save=False
show
# Pose Estimation: yolo predict model=yolo11n-pose.pt source=0 save=False show
# Oriented Object Detection: yolo predict model=yolo11n-obb.pt source=0
save=False show
```

Click the terminal and press the "Ctrl + C" shortcut to terminate the program!

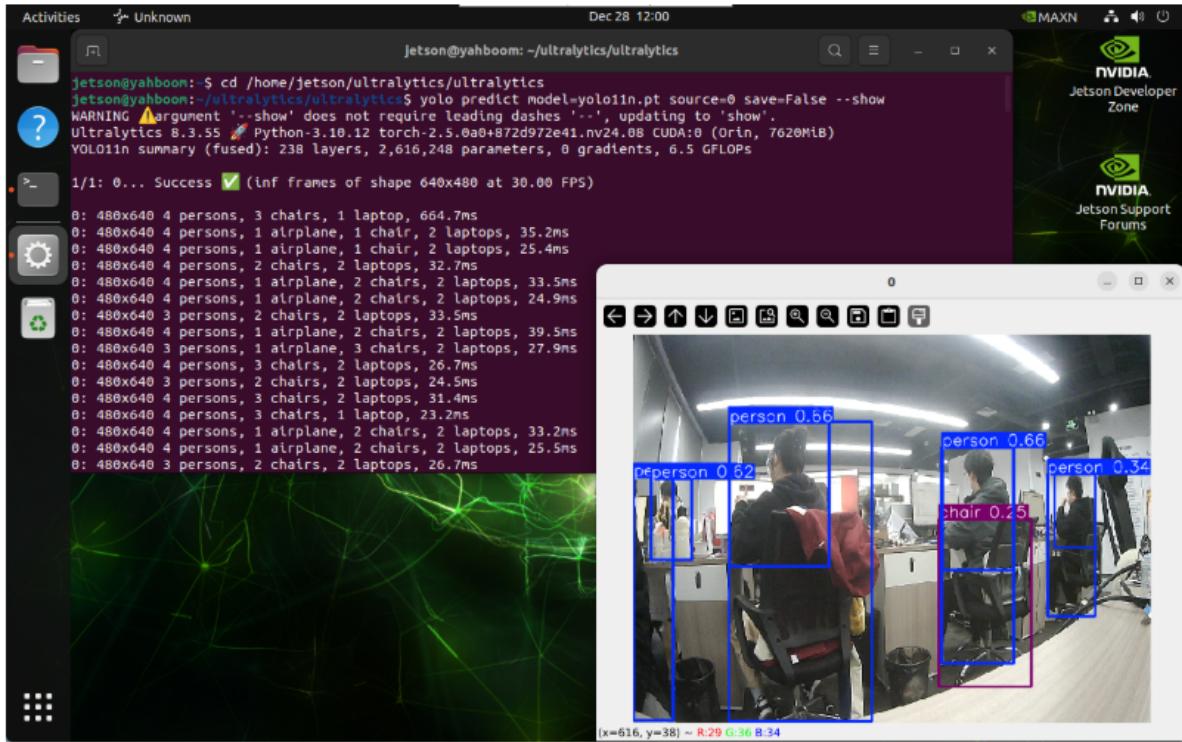
Parameter Description

model: Specifies the YOLO model

source: Specifies the recognition source (multiple cameras can switch between digital ones)

save=False: Disables saving results

show: Displays results in real time



References

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

<https://docs.ultralytics.com/usage/cli/>