

YOLOv11Object recognition

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1. Best performance mode
 - 1.1. Enable MAX mode
 - 1.2. Enable Jetson Clocks
2. Model prediction
 - 2.1. CLI usage
 - 2.2. Python usage
 - 2.2.1, USB camera
Effect preview
 - 2.2.1, CSI camera
Effect preview

1. Best performance mode

1.1. Enable MAX mode

Enabling MAX Power Mode on Jetson will ensure that all CPU and GPU cores are turned on:

```
# Jetson orin nx
sudo nvpmode1 -m 0
# Jetson orin nano
sudo nvpmode1 -m 2
```

1.2. Enable Jetson Clocks

Enabling Jetson Clocks will ensure that all CPU and GPU cores run at maximum frequency:

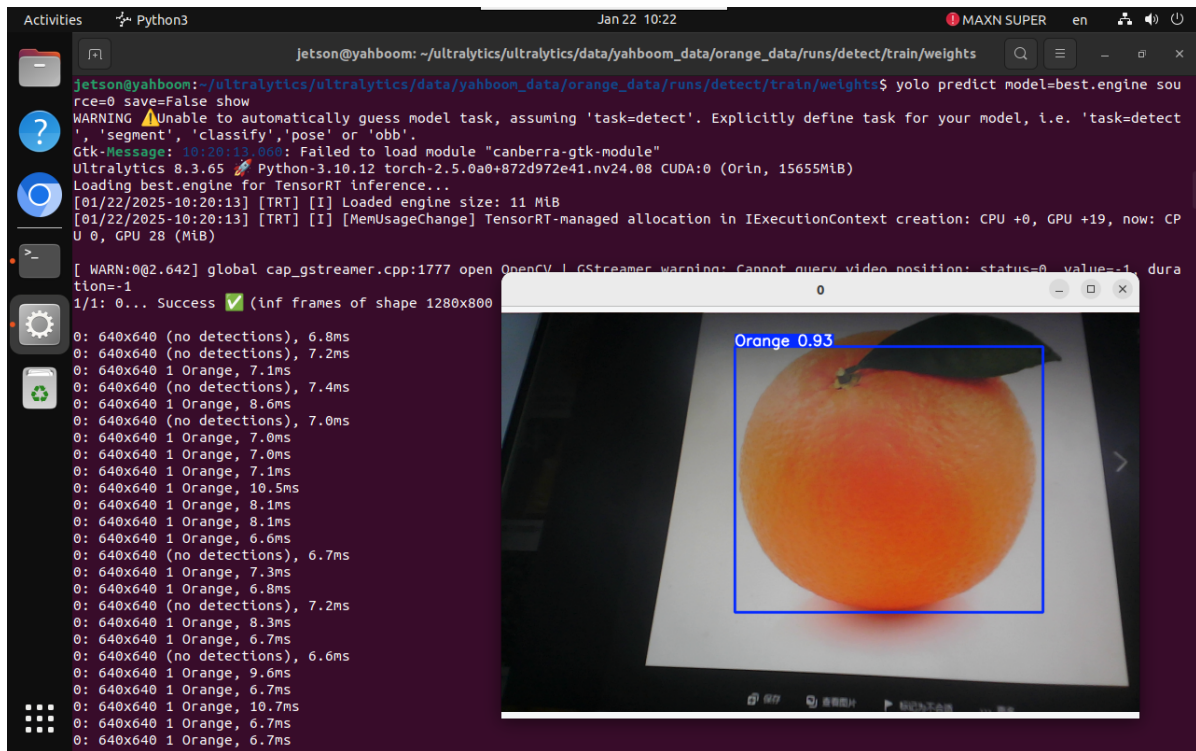
```
sudo jetson_clocks
```

2. Model prediction

2.1. CLI usage

CLI currently only supports calling USB cameras. CSI camera users can directly modify the previous python code to call onnx and engine models!

```
yolo predict model=best.engine source=0 save=False show # If there are multiple
cameras, follow the number after the source
```



2.2, Python usage

Use Python to call USB camera and CSI camera to identify oranges.

2.2.1, USB camera

Use best.engine to predict camera images:

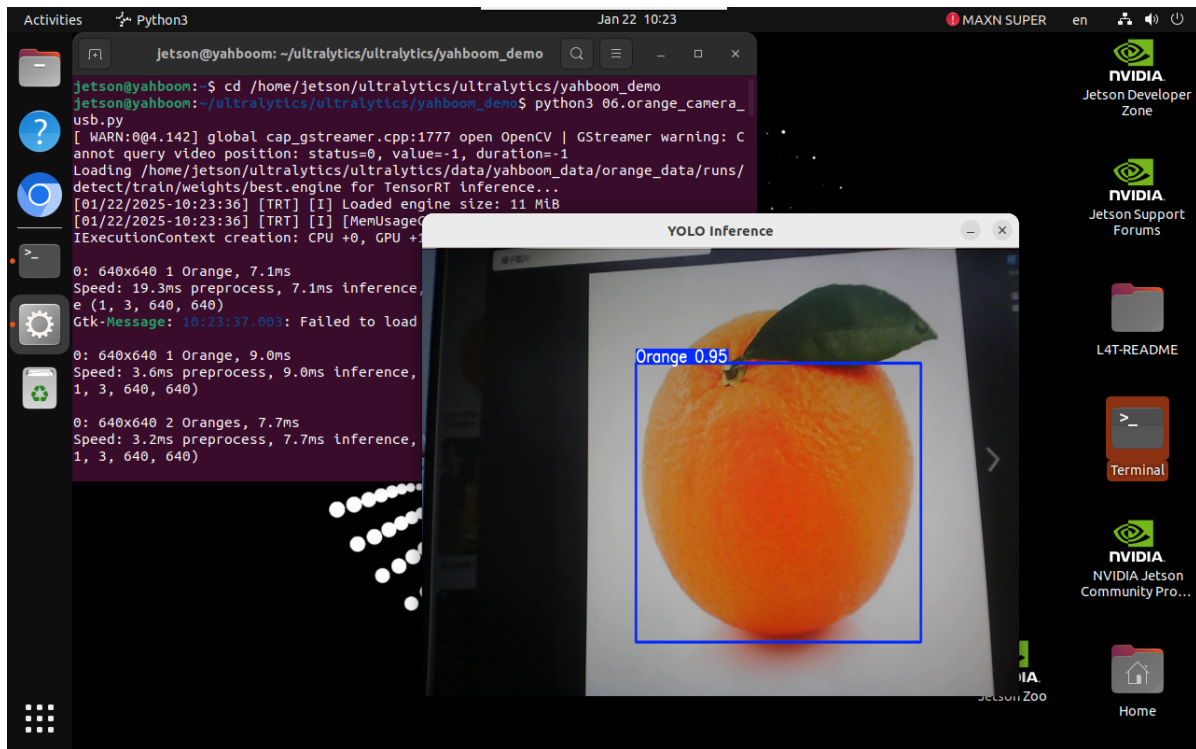
```
cd /home/jetson/ultralytics/ultralytics/yahboom_demo
```

Run the code: Click the preview screen, press the q key to terminate the program!

```
python3 06.orange_camera_usb.py
```

Effect preview

Video location of yolo recognition output: /home/jetson/ultralytics/ultralytics/output/



Sample code:

```
import cv2
from ultralytics import YOLO

# Load the YOLO model
# model =
YOLO("/home/jetson/ultralytics/ultralytics/data/yahboom_data/orange_data/runs/detect/train/weights/best.pt")
# model =
YOLO("/home/jetson/ultralytics/ultralytics/data/yahboom_data/orange_data/runs/detect/train/weights/best.onnx")
model =
YOLO("/home/jetson/ultralytics/ultralytics/data/yahboom_data/orange_data/runs/detect/train/weights/best.engine")

# Open the camera
cap = cv2.VideoCapture(0)

# Get the video frame size and frame rate
frame_width = int(cap.get(cv2.CAP_PROP_FRAME_WIDTH))
frame_height = int(cap.get(cv2.CAP_PROP_FRAME_HEIGHT))
fps = int(cap.get(cv2.CAP_PROP_FPS))

# Define the codec and create a VideoWriter object to output the processed video
output_path =
"/home/jetson/ultralytics/ultralytics/output/06.orange_camera_usb.mp4"
fourcc = cv2.VideoWriter_fourcc(*'mp4v') # You can use 'XVID' or 'mp4v'
depending on your platform
out = cv2.VideoWriter(output_path, fourcc, fps, (frame_width, frame_height))

# Loop through the video frames
while cap.isopen():
    # Read a frame from the video
    success, frame = cap.read()
```

```

if success:
    # Run YOLO inference on the frame
    results = model(frame)

    # Visualize the results on the frame
    annotated_frame = results[0].plot()

    # Write the annotated frame to the output video file
    out.write(annotated_frame)

    # Display the annotated frame
    cv2.imshow("YOLO Inference", cv2.resize(annotated_frame, (640, 480)))

    # Break the loop if 'q' is pressed
    if cv2.waitKey(1) & 0xFF == ord("q"):
        break
else:
    # Break the loop if the end of the video is reached
    break
# Release the video capture and writer objects, and close the display window
cap.release()
out.release()
cv2.destroyAllWindows()

```

2.2.1, CSI camera

Use best.engine to predict the camera image:

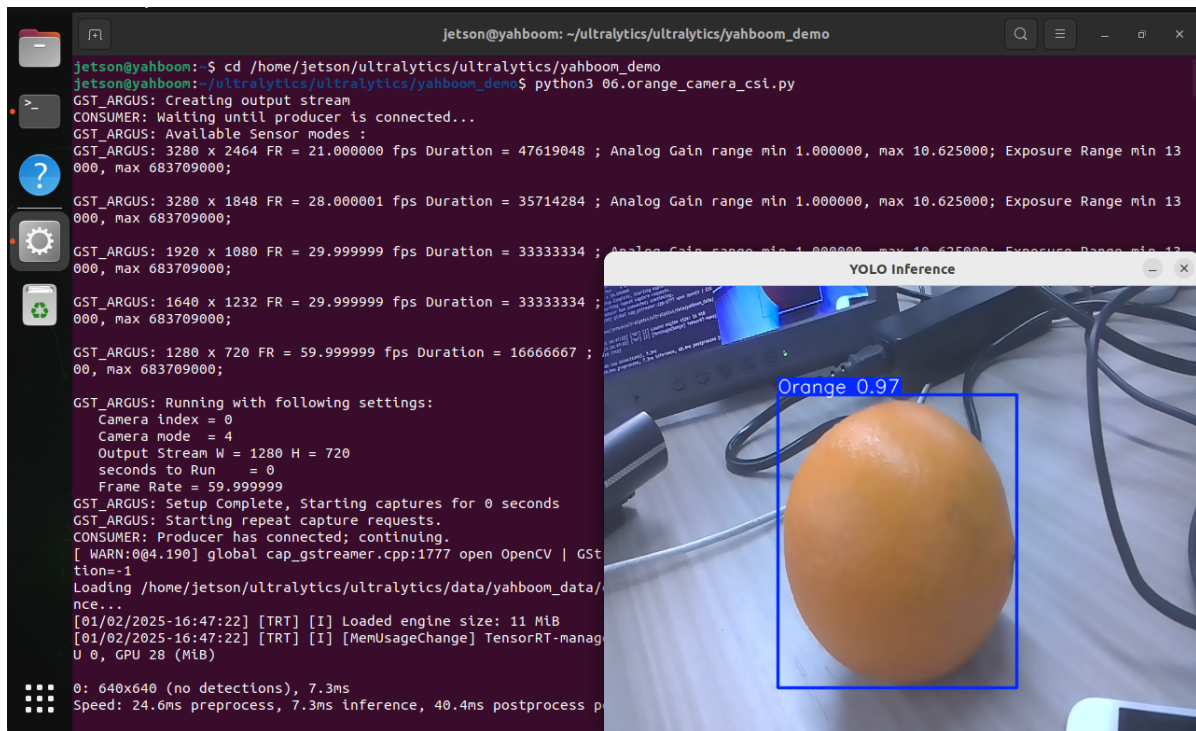
```
cd /home/jetson/ultralytics/ultralytics/yahboom_demo
```

Run the code: Click the preview image, press the q key to terminate the program!

```
python3 06.orange_camera_csi.py
```

Effect preview

Yolo recognizes the output video location: /home/jetson/ultralytics/ultralytics/output/



Sample code:

```
import cv2
from ultralytics import YOLO
from jetcam.csi_camera import CSICamera

# Load the YOLO model
# model =
YOLO("/home/jetson/ultralytics/ultralytics/data/yahboom_data/orange_data/runs/det
ect/train/weights/best.pt")
# model =
YOLO("/home/jetson/ultralytics/ultralytics/data/yahboom_data/orange_data/runs/det
ect/train/weights/best.onnx")
model =
YOLO("/home/jetson/ultralytics/ultralytics/data/yahboom_data/orange_data/runs/det
ect/train/weights/best.engine")

# open the camera (CSI Camera)
cap = CSICamera(width=640, height=480)

# Get the video frame size and frame rate
frame_width = 640
frame_height = 480
fps = 30

# Define the codec and create a VideoWriter object to output the processed video
output_path =
"/home/jetson/ultralytics/ultralytics/output/06.orange_camera_csi.mp4"
fourcc = cv2.VideoWriter_fourcc(*'mp4v') # You can use 'XVID' or 'mp4v'
depending on your platform
out = cv2.VideoWriter(output_path, fourcc, fps, (frame_width, frame_height))

# Loop through the video frames
while True:
    # Read a frame from the camera
```

```
frame = cap.read()

if frame is not None:
    # Run YOLO inference on the frame
    results = model(frame)

    # Visualize the results on the frame
    annotated_frame = results[0].plot()

    # Write the annotated frame to the output video file
    out.write(annotated_frame)

    # Display the annotated frame
    cv2.imshow("YOLO Inference", cv2.resize(annotated_frame, (640, 480)))

    # Break the loop if 'q' is pressed
    if cv2.waitKey(1) & 0xFF == ord("q"):
        break
else:
    # Break the loop if no frame is received (camera error or end of stream)
    print("No frame received, breaking the loop.")
    break

# Release the video capture and writer objects, and close the display window
cap.release()
out.release()
cv2.destroyAllWindows()
```