Oriented Bounding Boxes Object Detection

Use Python to demonstrate **Ultralytics**: Oriented Bounding Boxes Object Detection effects on images, videos, and real-time detection.

1. Enable Maximum Board Performance

1.1. Enable MAX Power Mode

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

```
#Orin Nano
sudo nvpmodel -m 2
#Orin Nx
sudo nvpmodel -m 0
```

1.2. Enable Jetson Clocks

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

```
sudo jetson_clocks
```

2. Oriented Bounding Boxes Object Detection: Image

Use yolo11n-obb.pt to predict images in the ultralytics project (not images that come with ultralytics).

Enter the code folder:

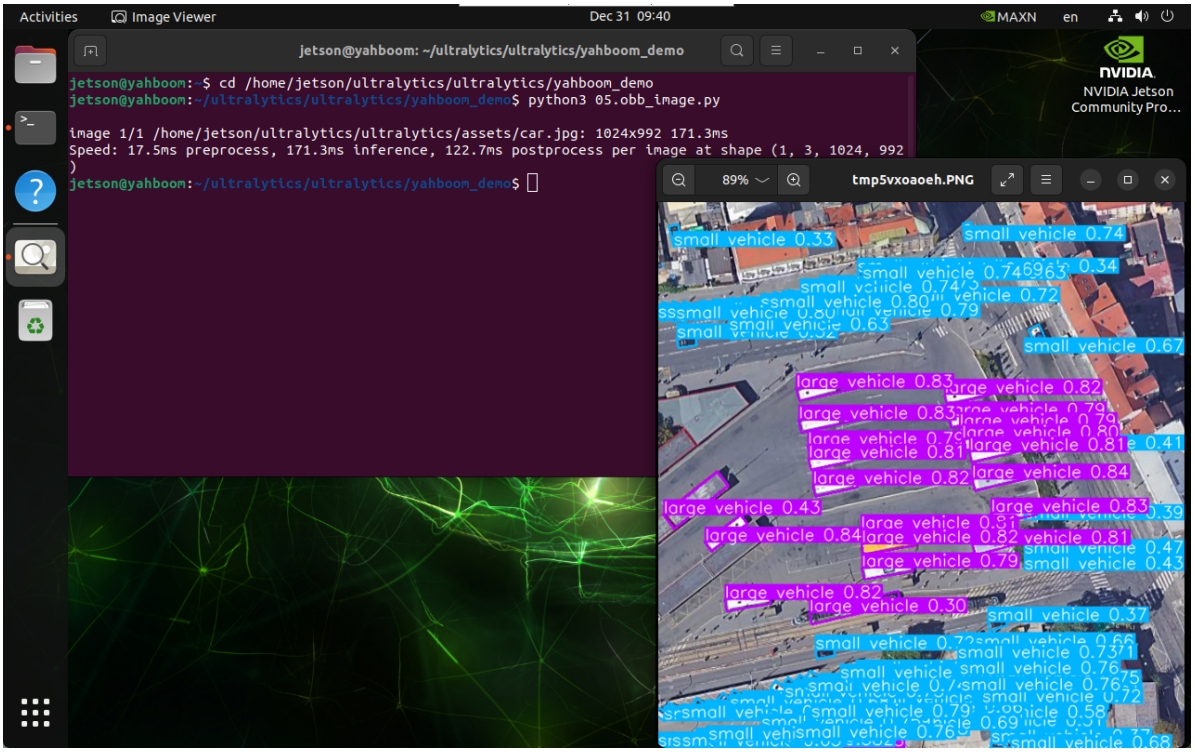
```
cd /home/jetson/ultralytics/ultralytics/yahboom_demo
```

Run the code:

```
python3 05.obb_image.py
```

Effect Preview

yolo recognition output image location: /home/jetson/ultralytics/ultralytics/output/



Example code:

```
from ultralytics import YOLO

# Load a model
model = YOLO("/home/jetson/ultralytics/ultralytics/yolo11n-obb.pt")

# Run batched inference on a list of images
results = model("/home/jetson/ultralytics/ultralytics/assets/car.jpg")  # return
a list of Results objects

# Process results list
for result in results:
    # boxes = result.boxes  # Boxes object for bounding box outputs
    # masks = result.masks  # Masks object for segmentation masks outputs
    # keypoints = result.keypoints  # Keypoints object for pose outputs
    # probs = result.probs  # Probs object for classification outputs
    obb = result.obb  # Oriented boxes object for OBB outputs
    result.show()  # display to screen

 result.save(filename="/home/jetson/ultralytics/ultralytics/output/car_output.jp
g")  # save to disk
```

3. Oriented Bounding Boxes Object Detection: Video

Use yolo11n-obb.pt to predict videos in the ultralytics project (not videos that come with ultralytics).

Enter the code folder:

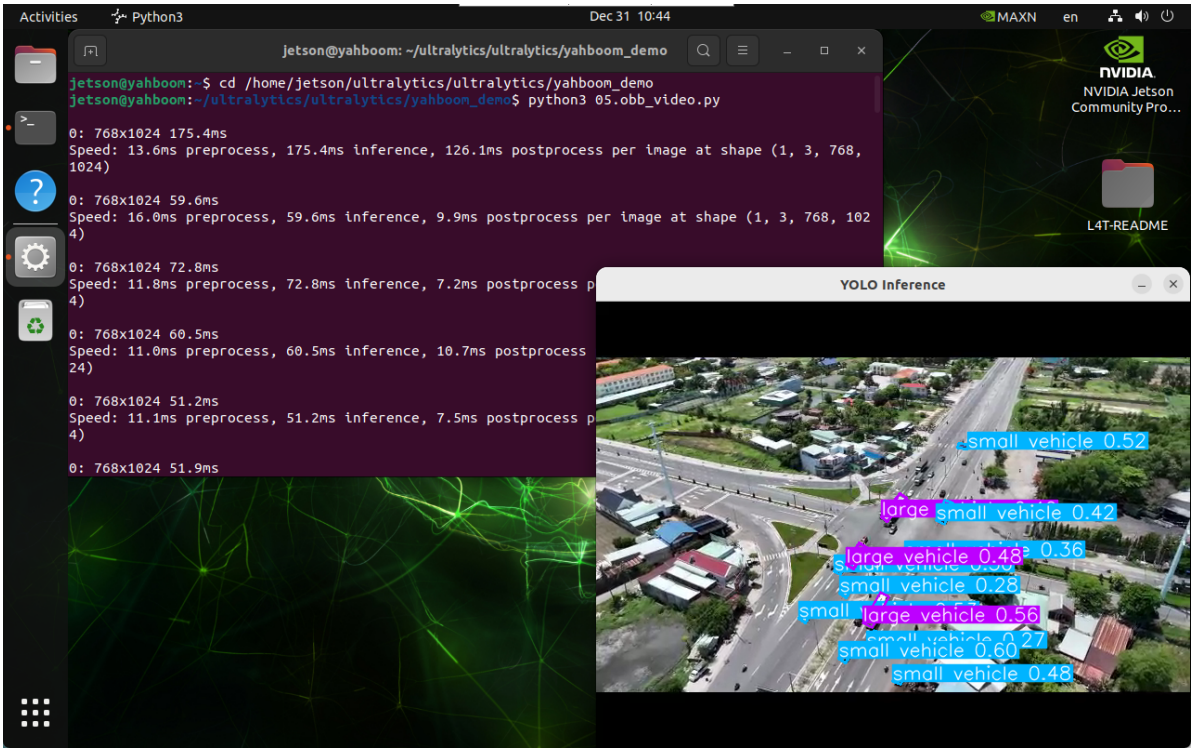
```
cd /home/jetson/ultralytics/ultralytics/yahboom_demo
```

Run the code:

```
python3 05.obb_video.py
```

Effect Preview

yolo recognition output video location: /home/jetson/ultralytics/ultralytics/output/



Example code:

```
import cv2
from ultralytics import YOLO

# Load the YOLO model
model = YOLO("/home/jetson/ultralytics/ultralytics/yolo11n-obb.pt")

# Open the video file
video_path = "/home/jetson/ultralytics/ultralytics/videos/street.mp4"
cap = cv2.VideoCapture(video_path)

# 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/05.street_output.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.isOpened():
    # 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()
```

4. Oriented Bounding Boxes Object Detection: Real-time Detection

4.1. USB Camera

Use yolo11n-obb.pt to predict USB camera feed.

Enter the code folder:

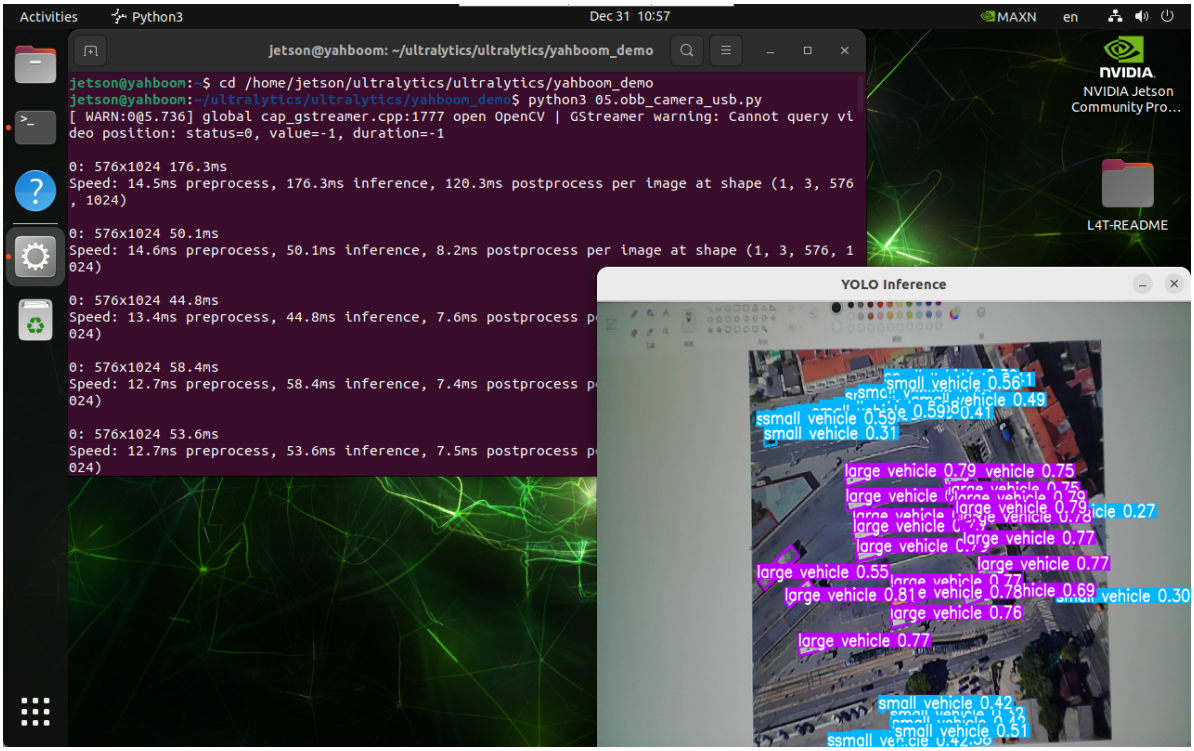
```
cd /home/jetson/ultralytics/ultralytics/yahboom_demo
```

Run the code: Click on the preview window and press 'q' key to terminate the program!

```
python3 05.obb_camera_usb.py
```

Effect Preview

yolo recognition output video location: /home/jetson/ultralytics/ultralytics/output/



Example code:

```python
import cv2
from ultralytics import YOLO

# Load the YOLO model
model = YOLO("/home/jetson/ultralytics/ultralytics/yolo11n-obb.pt")

# 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/05.obb_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.isOpened():
    # 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()
```

4.2. CSI Camera

Use yolo11n-obb.pt to predict CSI camera feed.

Enter the code folder:

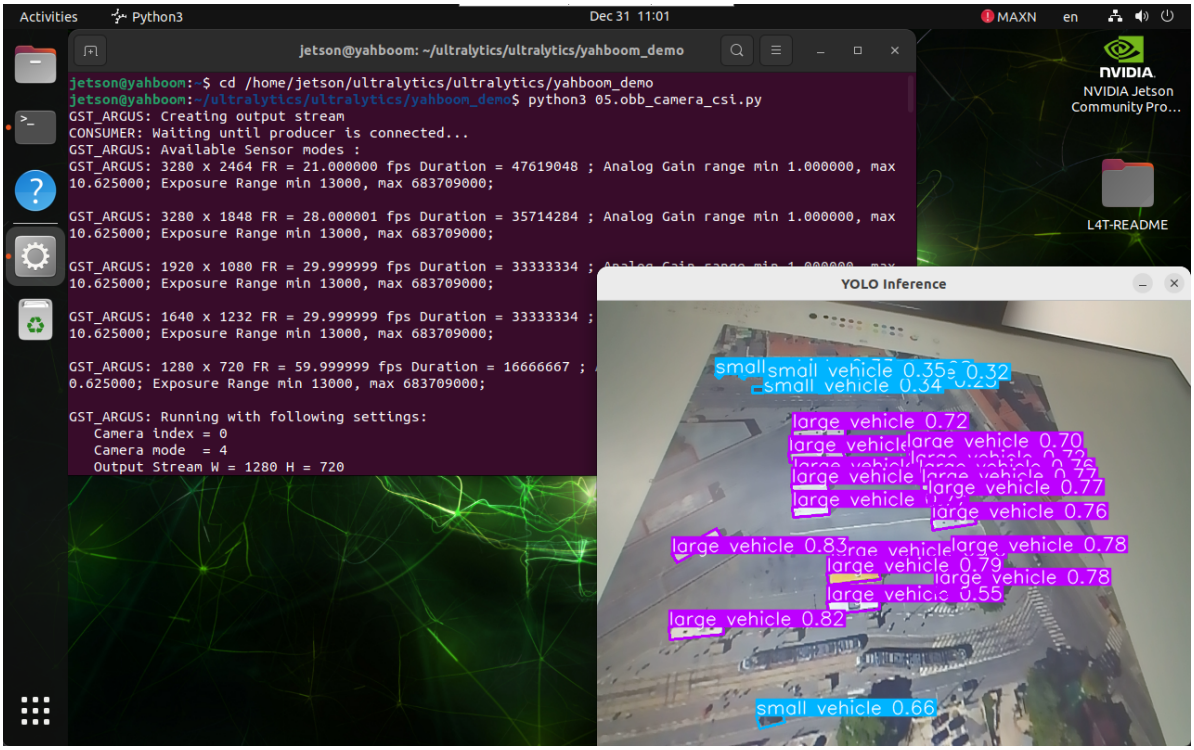
```
cd /home/jetson/ultralytics/ultralytics/yahboom_demo
```

Run the code: Click on the preview window and press 'q' key to terminate the program!

```
python3 05.obb_camera_csi.py
```

Effect Preview

yolo recognition output video location: /home/jetson/ultralytics/ultralytics/output/



Example code:

```
import cv2
```

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

# Load the YOLO model
model = YOLO("/home/jetson/ultralytics/ultralytics/yolo11n-obb.pt")

# Open the camera (CSI Camera)
cap = CSICamera(capture_device=0, 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/05.obb_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()
```

References

https://docs.ultralytics.com/tasks/obb/