

Yolo5+Tensorrt acceleration+DeepStream (turn on camera)

1.Precautions before use

If you are using the YAHBOOM version of the image, there is no need to build the DeepStream environment. If you have built your own image, you need to build the environment for DeepStream. You can refer to the DeepStream building tutorial we provide, or you can also build your own Baidu

2.Instructions for use

2.1 Model Conversion

```
git clone https://github.com/marcoslucianops/DeepStream-Yolo.git #
cd DeepStream-Yolo/Utils
cp gen_wts_yolov5.py ../../yolov5
cd ../../yolov5
python3 gen_wts_yolov5.py -w ./yolov5s.pt
```


2.2 Deployment Model

1. After successfully running the previous step, two files will appear in the directory of yolov5, yolov5n.cfg and yolov5n.wts

```

4096 3月 31 12:00 ./
4096 3月 31 11:58 ../
4961 3月 31 11:58 CONTRIBUTING.md
4096 3月 31 11:58 data/
13305 3月 31 11:58 detect.py
2184 3月 31 11:58 Dockerfile
3702 3月 31 11:58 .dockerignore
28058 3月 31 11:58 export.py
15259 3月 31 11:59 gen_wts_yoloV5.py
4096 3月 31 11:58 .git/
75 3月 31 11:58 .gitattributes
4096 3月 31 11:58 .github/
3982 3月 31 11:58 .gitignore*
6445 3月 31 11:58 hubconf.py
35127 3月 31 11:58 LICENSE
4096 3月 31 11:59 models/
1554 3月 31 11:58 .pre-commit-config.yaml
15866 3月 31 11:58 README.md
926 3月 31 11:58 requirements.txt*
1272 3月 31 11:58 setup.cfg
33864 3月 31 11:58 train.py
56522 3月 31 11:58 tutorial.ipynb
4096 3月 31 11:59 utils/
18893 3月 31 11:58 val.py
6879 3月 31 11:59 yoloV5n.cfg
4062133 3月 31 11:59 yoloV5n.pt
16943740 3月 31 11:59 yoloV5n.wts

```



2. Place yoloV5n. cfg and yoloV5n. wts in the DeepStream Yolo folder of Jetson nano

```

4096 4月 2 16:48 ./
4096 4月 2 16:19 ../
621 4月 2 16:19 config_infer_primary.txt
623 4月 2 16:19 config_infer_primary_yolor.txt
622 4月 2 16:19 config_infer_primary_yoloV2.txt
619 4月 2 16:19 config_infer_primary_yoloV5.txt
863 4月 2 16:19 deepstream_app_config.txt
4096 4月 2 16:19 docs/
4096 4月 2 16:19 .git/
4096 4月 2 16:19 .github/
624 4月 2 16:19 labels.txt
4096 4月 2 16:19 nvdsinfer_custom_impl_Yolo/
19517 4月 2 16:19 readme.md
4096 4月 2 16:19 utils/
6879 4月 2 16:48 yoloV5n.cfg
16943740 4月 2 16:48 yoloV5n.wts
space/DeepStream-YoloS

```

2.3 Modifying the Deepstream configuration file (this step can be omitted for images in the YAHBOOM version)

1. Modify Deepstream_app_Config.txt file
The modified content is as follows:
Comment on 70 lines, add a line after: config-file=config_infer_primary_yoloV5.txt
As shown in the figure:

```

65 [primary-gie]
66 enable=1
67 gpu-id=0
68 gie-unique-id=1
69 nvbuf-memory-type=0
70 #config-file=config_infer_primary.txt
71 config-file=config_infer_primary_yoloV5.txt
72
--

```

2. Modify the second configuration file config_infer_primary_yoloV5.txt

```

[property]
# 省略 ...
**model-engine-file=model_b2_gpu0_fp16.engine** # 修改 fp32->fp16
batch-size=2 # batch-size 改为2, 速度会快一些
# 省略...
**network-mode=2 *** 修改为 2, 强制使用fp16推理

```

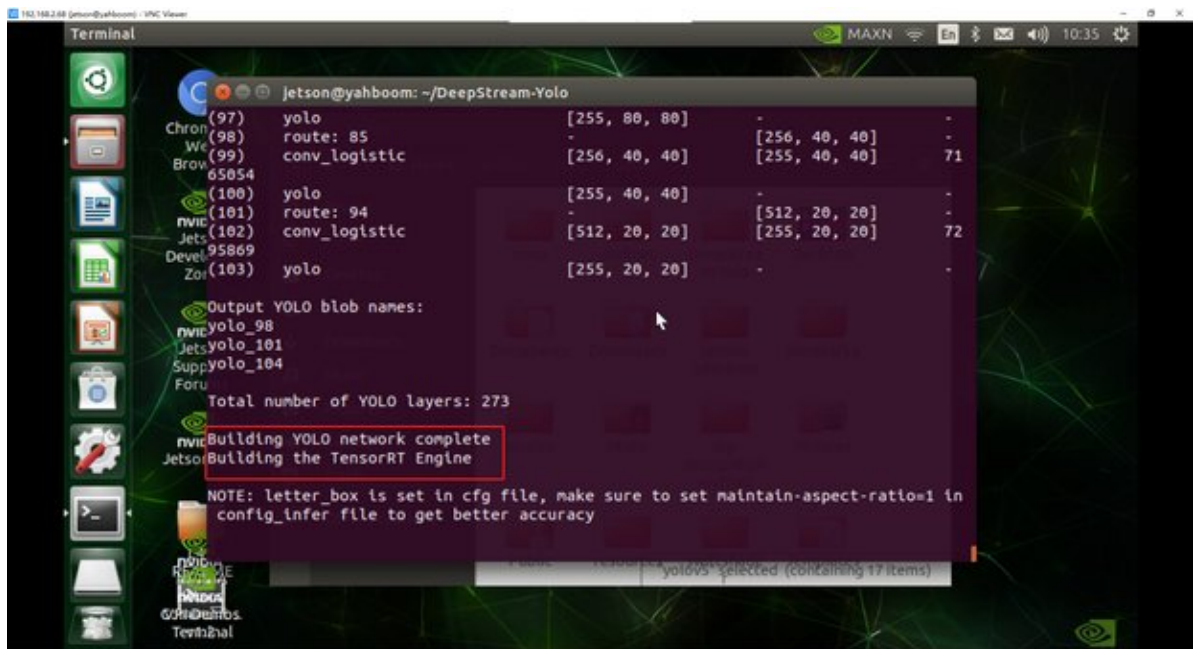
Note: FPS is related to parameters such as input image size, batch size, interval, etc., and needs to be optimized according to practical applications. Here, we directly change the batch size of the input to 2, which will significantly improve the inference speed of the model

3.Compile and Run

```

cd nvdsinfer_custom_impl_Yolo/
CUDA_VER=10.2 make -j2 #根据你的CUDA版本修改10.2数字部分
cd ..
deepstream-app -c deepstream_app_config.txt

```



After waiting for a while, you can see that the CSI camera screen has opened

pay attention to

1. If you are using your own built image, you need to deepstream_app_Modify config.txt Modify as shown in the figure:

```
#[source0]
#enable=1
#type=3
#uri=file:///opt/nvidia/deepstream/deepstream/samples/streams/sample_1080p_h264.mp4
#num-sources=1
#gpu-id=0
#cudadec-memtype=0
```

```
[source1]
enable=1
#Type - 1=CameraV4L2 2=URI 3=MultiURI 4=RTSP 5=CSI
type=5
camera-csi-sensor-id=0
camera-width=1280
camera-height=720
camera-fps-n=30
camera-fps-d=1
```

2. If using a USB camera, you need to change type=5 to type=1

```
#[source0]
#enable=1
#type=3
#uri=file:///opt/nvidia/deepstream/deepstream/samples/streams/sample_1080p_h264.mp4
#num-sources=1
#gpu-id=0
#cudadec-memtype=0
```

```
[source1]
enable=1
#Type - 1=CameraV4L2 2=URI 3=MultiURI 4=RTSP 5=CSI
type=5
camera-csi-sensor-id=0
camera-width=1280
camera-height=720
camera-fps-n=30
camera-fps-d=1
```