

8. Object detection

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1. Program function description

A number of object detection algorithm models are provided in the RDK-X3 board, and object detection can be achieved by using MIPI camera after the program is started.

You can view the identification result in the browser on the PC.

2. FCOS

FCOS is Horizon's open source Onnx model, which uses COCO data set for training and supports 80 types of target detection, including people, animals, fruits, vehicles, etc.

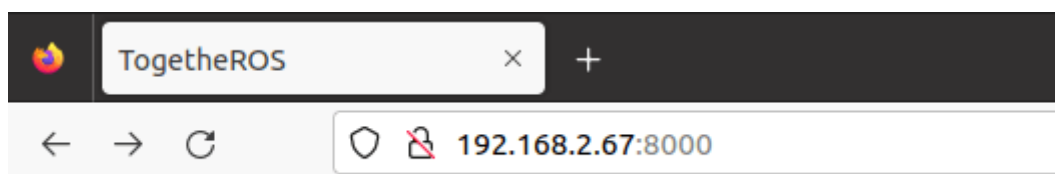
Application scenario: FCOS, released in 2019, is a single-stage object detection algorithm that can realize pedestrian detection, vehicle detection and other functions, mainly applied to autonomous driving, smart home and other fields.

After SSH connects to the car, the terminal runs,

```
ros2 launch dnn_node_example hobot_dnn_node_example.launch.py  
config_file:=config/fcosworkconfig.json image_width:=480 image_height:=272
```

Open the browser on the PC side (note that the computer and the Rising Sun network must be in the same LAN), enter the URL: car IP:8000, for example, my car IP is 192.168.2.67, enter the URL in the browser on the virtual machine side,

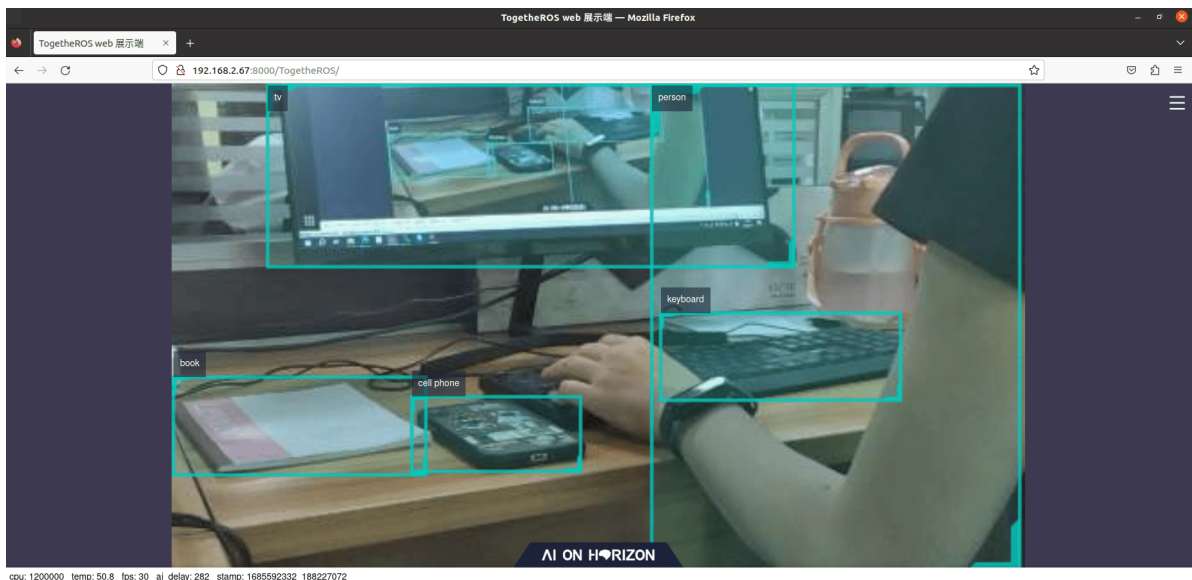
192.168.2.67:8000



TogetherROS Web display terminal

- [Web display terminal](#)

Click to enter the Web display terminal, the display screen is as follows:



3. YOLO

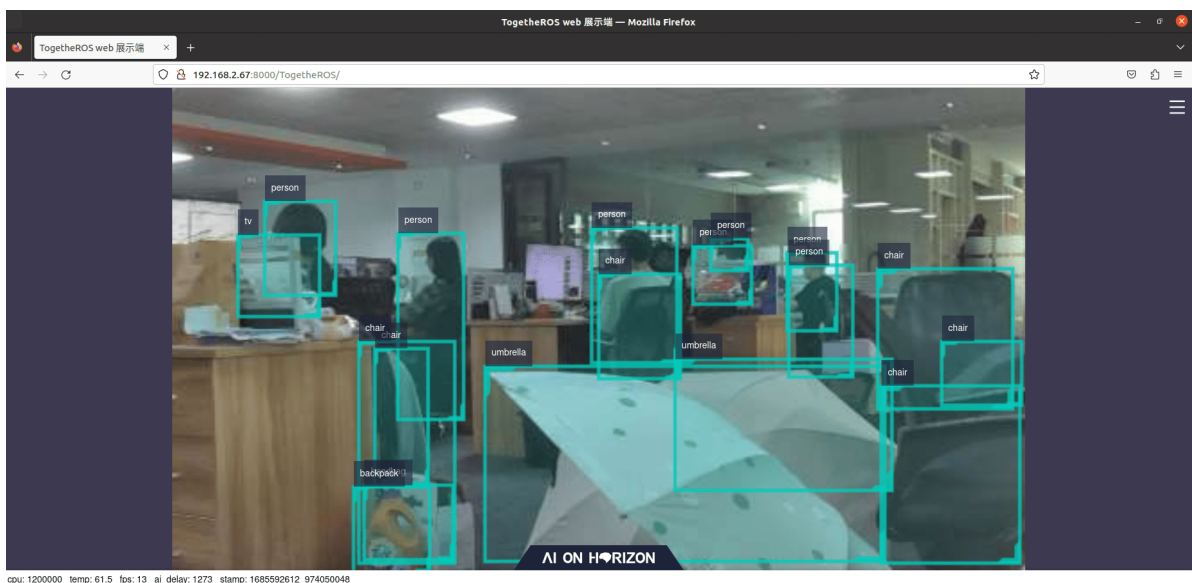
The YOLO object detection algorithm example uses images as input, uses BPU for algorithmic inference, and publishes an algorithm msg containing object categories and detection boxes. yolov2, yolov3, and yolov5 are supported. The model is trained using COCO data set, and supports 80 types of target detection, including human, animal, fruit, and vehicle.

Application scenario: YOLO series, as a representative algorithm in single-stage target detection, has the advantages of fast speed and good generalization, and can realize garbage identification, vehicle detection and other functions, mainly used in automatic driving, smart home and other fields.

After SSH connects to the car, the terminal runs,

```
ros2 launch dnn_node_example hobot_dnn_node_example.launch.py
config_file:=config/yolov2workconfig.json image_width:=480 image_height:=272
```

The Web display terminal displays the following screen:



4. MobileNet_SSD

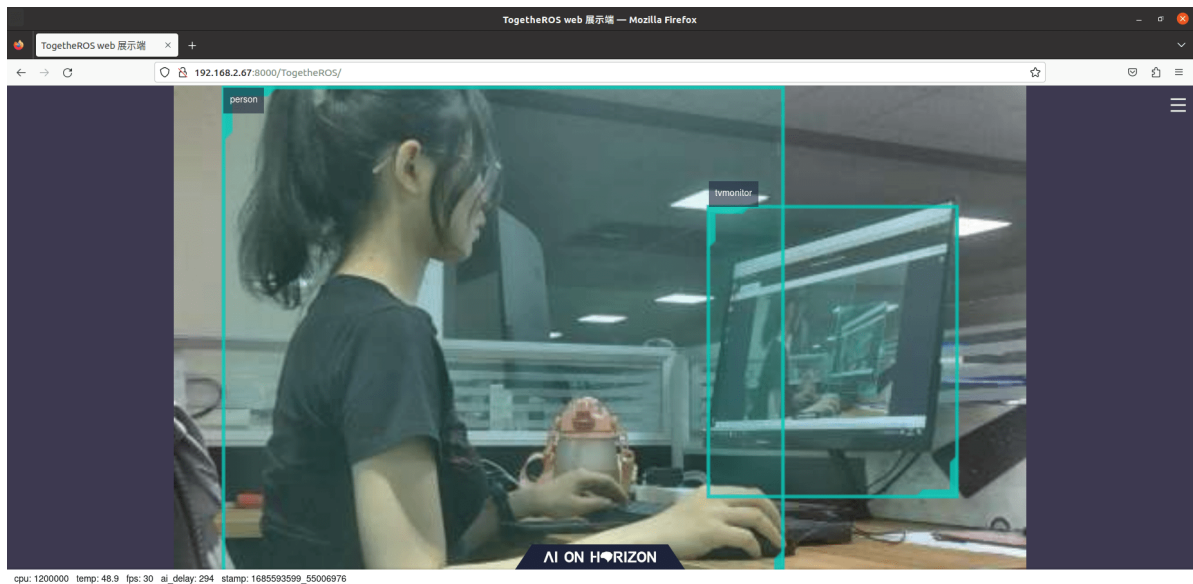
MobileNet_SSD from < <https://github.com/chuanqi305/MobileNet-SSD> > caffe model, using the VOC data set for training, support for the target detection of types including people, animals, fruits, transportation etc. A total of 20 types.

Application scenario: MobileNet_SSD is an object detection algorithm based on MobileNet, which has the advantages of fast speed and easy deployment, and can realize object detection, garbage identification and other functions, mainly used in automatic driving, smart home and other fields.

After SSH connects to the car, the terminal runs,

```
ros2 launch dnn_node_example hobot_dnn_node_example.launch.py
config_file:=config/mobilenet_ssd_workconfig.json image_width:=480
image_height:=272
```

The Web display terminal displays the following screen:



5. EfficientNet_Det

EfficientNet_Det from < <https://github.com/HorizonRobotics-Platform/ModelZoo/tree/master/EfficientDet> > Onnx model, Using COCO dataset for training, it supports 80 types of target detection, including people, animals, fruits, vehicles, etc.

Application scenarios: EfficientNet_Det provides functions such as vehicle detection, and mainly applies to automatic driving and smart home.

After SSH connects to the car, the terminal runs,

```
ros2 launch dnn_node_example hobot_dnn_node_example.launch.py
config_file:=config/efficient_det_workconfig.json image_width:=480
image_height:=272
```

The Web display terminal displays the following screen:

