Garbage identification

Testing based on the trained model can identify the name of the trained object.

1. Main code

Code path:

```
~/dofbot_pro/src/dofbot_basic_visual/scripts/05_Garbage_Identify.ipynb
```

Import header file

```
#!/usr/bin/env python
# coding: utf-8
import Arm_Lib
import os
import cv2 as cv
import threading
from time import sleep
import ipywidgets as widgets
from IPython.display import display
from dofbot_utils.fps import FPS
from ultralytics import YOLO
from dofbot_utils.robot_controller import Robot_Controller
```

Initialize the posture of the robot arm.

```
robot = Robot_Controller()
robot.move_look_map()
garbage = garbage_identify()
fps = FPS()
model = "General"
```

Initialize model

```
yolo_model = YOLO("./garbage.engine", task='detect')
fps = FPS()
model = "General"
```

Garbage name list:

```
 def garbage_getName(self):
        name = "None"
        if self.status == 'waiting':
            self.frame, msg = self.garbage_identify.garbage_run(self.frame)
            for key, pos in msg.items(): name = key
            if name == "Zip_top_can":               (self.garbage_num,
self.garbage_class) = ('00', '01')
            if name == "Old_school_bag":            (self.garbage_num,
self.garbage_class) = ('01', '01')
            if name == "Newspaper":                 (self.garbage_num,
self.garbage_class) = ('02', '01')
```

```
            if name == "Book":                      (self.garbage_num,
self.garbage_class) = ('03', '01')
            if name == "Toilet_paper":              (self.garbage_num,
self.garbage_class) = ('04', '02')
            if name == "Peach_pit":                 (self.garbage_num,
self.garbage_class) = ('05', '02')
            if name == "Cigarette_butts":           (self.garbage_num,
self.garbage_class) = ('06', '02')
            if name == "Disposable_chopsticks":     (self.garbage_num,
self.garbage_class) = ('07', '02')
            if name == "Egg_shell":                 (self.garbage_num,
self.garbage_class) = ('08', '03')
            if name == "Apple_core":                (self.garbage_num,
self.garbage_class) = ('09', '03')
            if name == "Watermelon_rind":           (self.garbage_num,
self.garbage_class) = ('10', '03')
            if name == "Fish_bone":                 (self.garbage_num,
self.garbage_class) = ('11', '03')
            if name == "Expired_tablets":           (self.garbage_num,
self.garbage_class) = ('12', '04')
            if name == "Expired_cosmetics":         (self.garbage_num,
self.garbage_class) = ('13', '04')
            if name == "Used_batteries":            (self.garbage_num,
self.garbage_class) = ('14', '04')
            if name == "Syringe":                   (self.garbage_num,
self.garbage_class) = ('15', '04')
            if name == "None":                      (self.garbage_num,
self.garbage_class) = ('None', 'None')
```

Main thread:

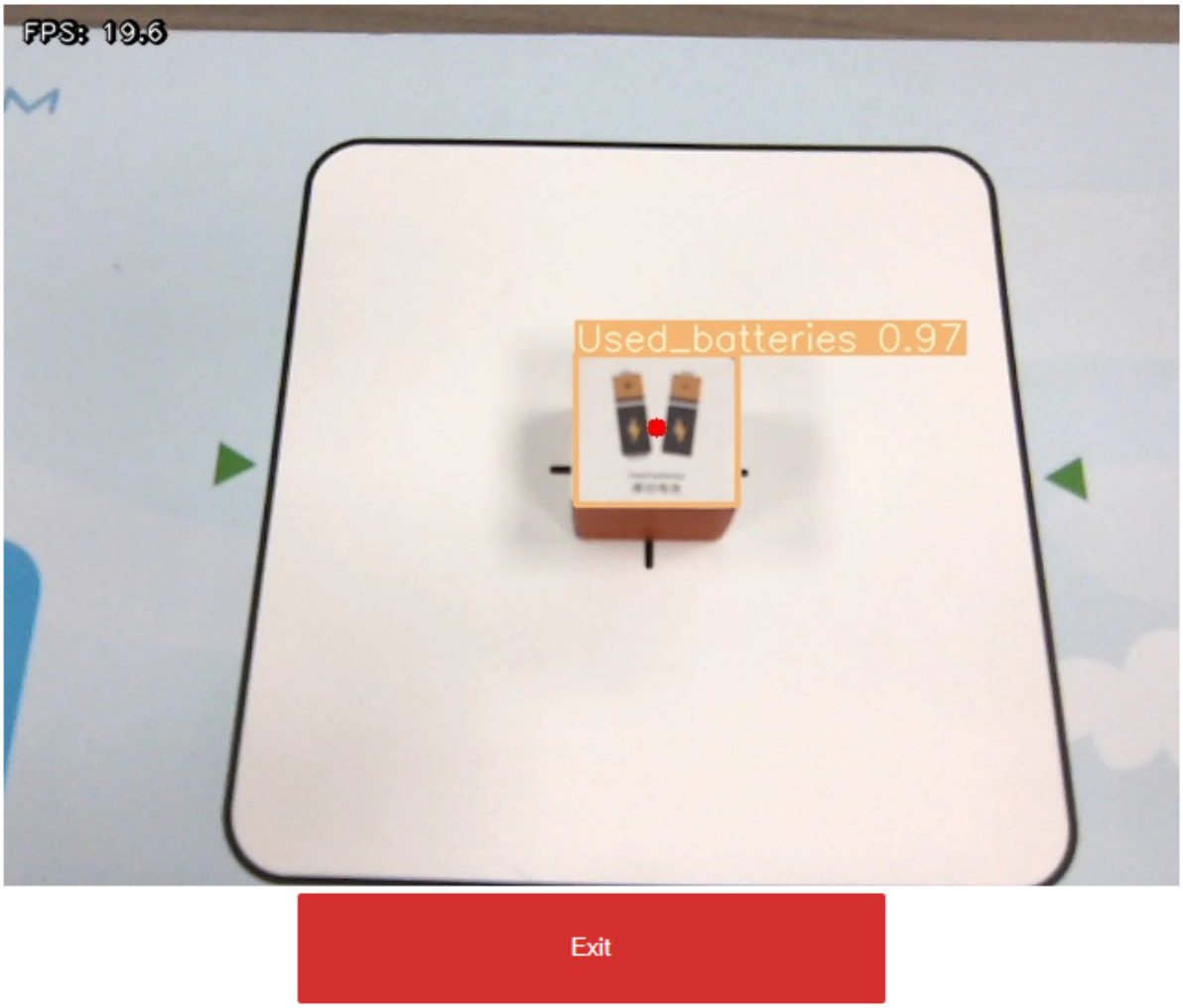
```
def camera():
    # 打开摄像头 Open camera
    capture = cv.VideoCapture(0)
    capture.set(cv.CAP_PROP_FRAME_WIDTH, 640)
    capture.set(cv.CAP_PROP_FRAME_HEIGHT, 480)
    # 当摄像头正常打开的情况下循环执行
    while capture.isOpened():
        try:
            _, img = capture.read()
            fps.update_fps()
            img, msg = garbage.garbage_run(img)
            if len(msg) > 0:
                for name, pos in msg.items():
                    print("name:", name)
            if model == 'Exit':
                cv.destroyAllWindows()
                capture.release()
                break
            fps.show_fps(img)
            imgbox.value = cv.imencode('.jpg', img)[1].tobytes()
        except Exception as e:
            capture.release()
            print(e)
            break
```

First open the system terminal and run roscore

```
roscore
```

Program Click the Run Entire Program button on the jupyterlab toolbar, then scroll to the bottom to see the camera component display.

If you put the garbage block face-up in the camera screen at this time, the garbage will be framed and the garbage name will be displayed.



Note: The garbage block must be placed face-up to ensure that the camera screen is facing the garbage icon, otherwise it may not be recognized.

If you need to exit the program, click the [Exit] button.