harris corner detection

Corner points are widely used in image processing, such as image matching (FPM feature point matching), camera calibration, etc. The basic idea of the algorithm is to use a fixed window to slide in any direction on the image, and compare the two situations before and after sliding, the degree of change in pixel grayscale in the window,If there is sliding in any direction and there is a large grayscale change, then we can think that there is a corner point in the window.

1. Use

Source code launch file path：/opt/ros/noetic/share/opencv_apps/launch

Step 1: Start the camera

```
roslaunch dofbot_visual opencv_apps.launch img_flip:=false
```

- img_flip parameter: whether the image needs to be flipped horizontally, the default is false.

[usb_cam-test.launch] file opens the [web_video_server] node by default, and you can directly use the [IP:8080] web page to view images in real time.

Step 2: Start the corner detection function of Opencv_apps

```
roslaunch opencv_apps corner_harris.launch                 # harris corner
detection
```

Each functional case will have a parameter [debug_view], Boolean type, whether to use Opencv to display images, which is displayed by default.

If no display is required, set it to [False], for example

```
roslaunch opencv_apps contour_moments.launch debug_view:=False
```

However, after starting in this way, some cases cannot be displayed in other ways, because in the source code, some [debug_view] is set to [False], which will turn off image processing.

2. Display method

- rqt_image_view

Enter the following command to select the corresponding topic

```
rqt_image_view
```

- opencv

The system displays it by default, no need to do anything.

- Web viewing

(Same as under LAN) Enter IP+port in the browser, for example:

```
192.168.2.116:8080
```

For specific IP, use your current virtual machine IP.

3. Effect display

You can see that the camera will mark the corners of the captured image.