12、Discrete fourier transform algorithm

The Fourier transform can decompose an image into its sine and cosine components. In other words, it can convert an image from its spatial domain to its frequency domain. The idea of this transformation is that any function can accurately approach the sum of infinite sin() functions and cos() functions. The Fourier transform provides this method to achieve this effect.

For discrete signals such as digital images, the frequency indicates the intensity of the signal change, or the speed of the signal change. The higher the frequency, the more drastic the change. The smaller the frequency, the gentler the signal. Corresponding to the image, high-frequency signals are often edge signals and noise signals in the image, while low-frequency signals include signals such as image contours and background that change frequently.

12.1、Use

源码launch文件路径：~~/jetcobot_ws/src/opencv_apps/launch

Source code launch file path: ~/jetcobot_ws/src/opencv_apps/launch

Step 1: Start the camera

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

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

Step 2: Start the corner detection function of Opencv_apps

```
roslaunch opencv_apps discrete_fourier_transform.launch   # Discrete Fourier
Transform Algorithm
```

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.

12.2、 Display method

- rqt_image_view

Enter the following command to select the corresponding topic

```
rqt_image_view
```

- opencv

The system displays it by default and no processing is required.

12.3、Effect display

On the right is the picture after the Fourier transform algorithm.