7.Face recognition

7.1 Overview

wiki：http://wiki.ros.org/opencv_apps

Source code：https://github.com/ros-perception/opencv_apps.git

Most of the code was originally taken from:https://github.com/Itseez/opencv/tree/master/samples/cpp

Functional package：~/software/library_ws/src/opencv_apps

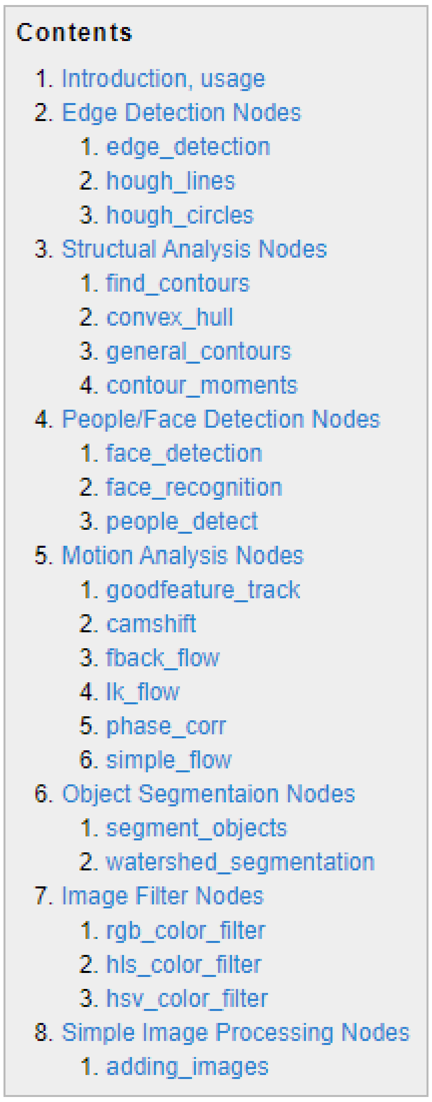
The topic subscribed by this function package is [/image]. What we have to do is to open the camera node, write a topic that converts the camera topic into a [/image] node, and publish the [/image] topic.

Turn on the camera and publish the path of the node of the [/image] topic:

```
~/dofbot_ws/src/dofbot_visual/scripts/pub_image.py
```

The opencv_apps program provides various nodes that internally run the functions of opencv and publish the results to a ROS topic. When using the opencv_apps program, you only need to run a launch file according to your own business needs, so that you no longer have to write program codes for these functions.

ROS Wiki has related node analysis, topic subscription and topic publishing of the corresponding node, introduction of related parameters, etc. See the ROS WiKi for details.


Contents

7.2 Use

Step 1: Start the camera

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

- `img_flip` parameter: Whether the image needs to be horizontally flipped; the default is `false`.

Step 2: Enable face recognition.

```
roslaunch opencv_apps face_recognition.launch              # face recognition
```

In almost every ROS + OpenCV application, there's a parameter called `debug_view`, a boolean value indicating whether to display images using OpenCV. The default is to display images.

If you don't need to display images, set it to `False`, for example...

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

However, after starting it this way, some examples may not be displayed using other methods because in the source code, setting `debug_view` to `False` in some cases disables image processing.

7.3 Display Methods

- rqt_image_view

Enter the following command and select the corresponding topic.

```
rqt_image_view
```

- opencv

The system displays the default value; no action is required.

7.4 Face recognition display

This case is based on autonomous training and real-time recognition by collecting images of people in real time, and the steps are slightly complicated.

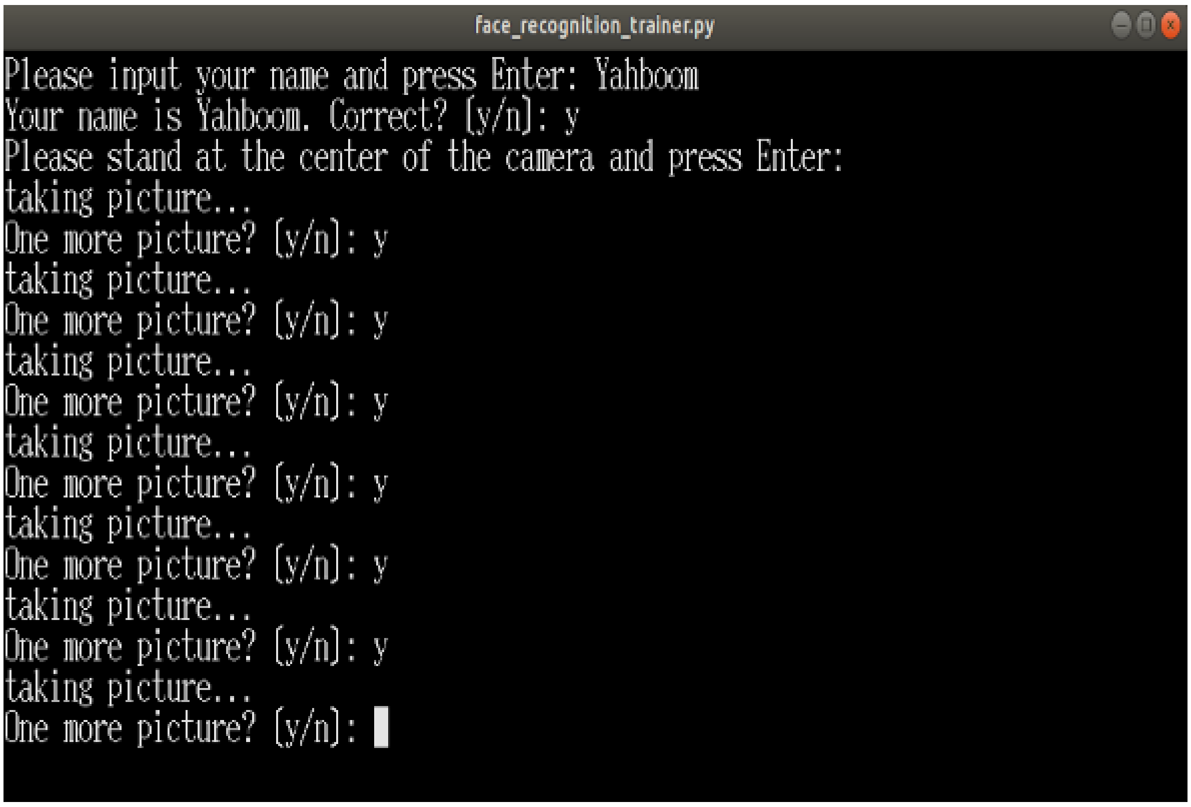
Parameter	Type	Default	Analyze
~approximate_sync	bool	false	Subscribe to the topic [camera_info] to get the default coordinate system ID, otherwise use the image information directly.
~queue_size	int	100	Queue size for subscribing topics
~model_method	string	"eigen"	Face recognition method: "eigen", "fisher" or "LBPH"
~use_saved_data	bool	true	Load training data from ~data_dir path
~save_train_data	bool	true	Save training data to ~data_dir path for retraining
~data_dir	string	"~/opencv_apps/face_data"	Save training data path
~face_model_width	int	190	Width of training face images
~face_model_height	int	90	Training face image height
~face_padding	double	0.1	Filling ratio of each face
~model_num_components	int	0	The number of components of the face recognizer model (0 is considered unlimited)
~model_threshold	double	8000.0	Face recognition model threshold
~lbph_radius	int	1	Radius parameter (for LBPH method only)
~lbph_neighbors	int	8	Neighborhood parameters (only for LBPH method)

Parameter	Type	Default	Analyze
~lbph_grid_x	int	8	Grid x parameter (only for LBPH method)
~lbph_grid_y	int	8	Grid y parameter (only for LBPH method)
~queue_size	int	100	Image subscriber queue size

Operation steps:

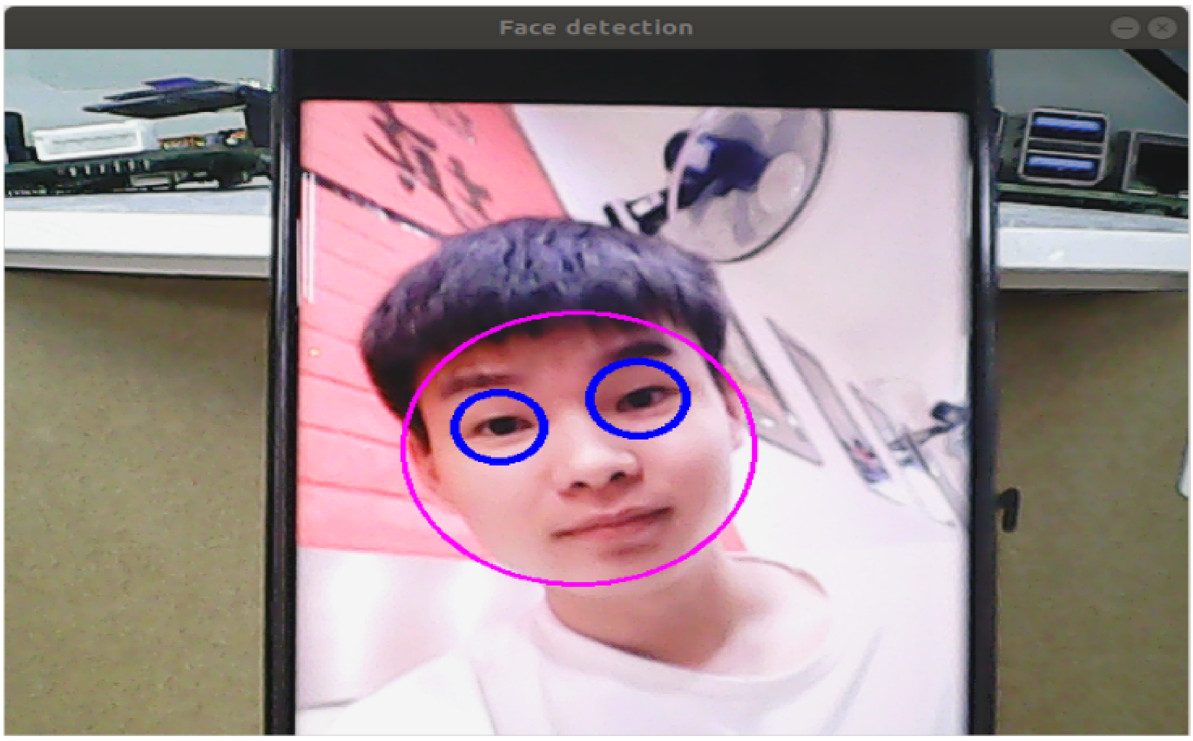
1. First, enter the character's name after the colon in the picture below: Yahboom
2. Confirm name: y
3. Then place the face in the center of the image and click OK.
4. Add a photo in a loop: y, click to confirm.
5. To end image collection, enter: n and click Confirm.
6. Close the launch file and restart.

If you need to enter the recognized identifications, cycle through steps 1 to 5 until all identified persons have been entered, and then proceed to step six.

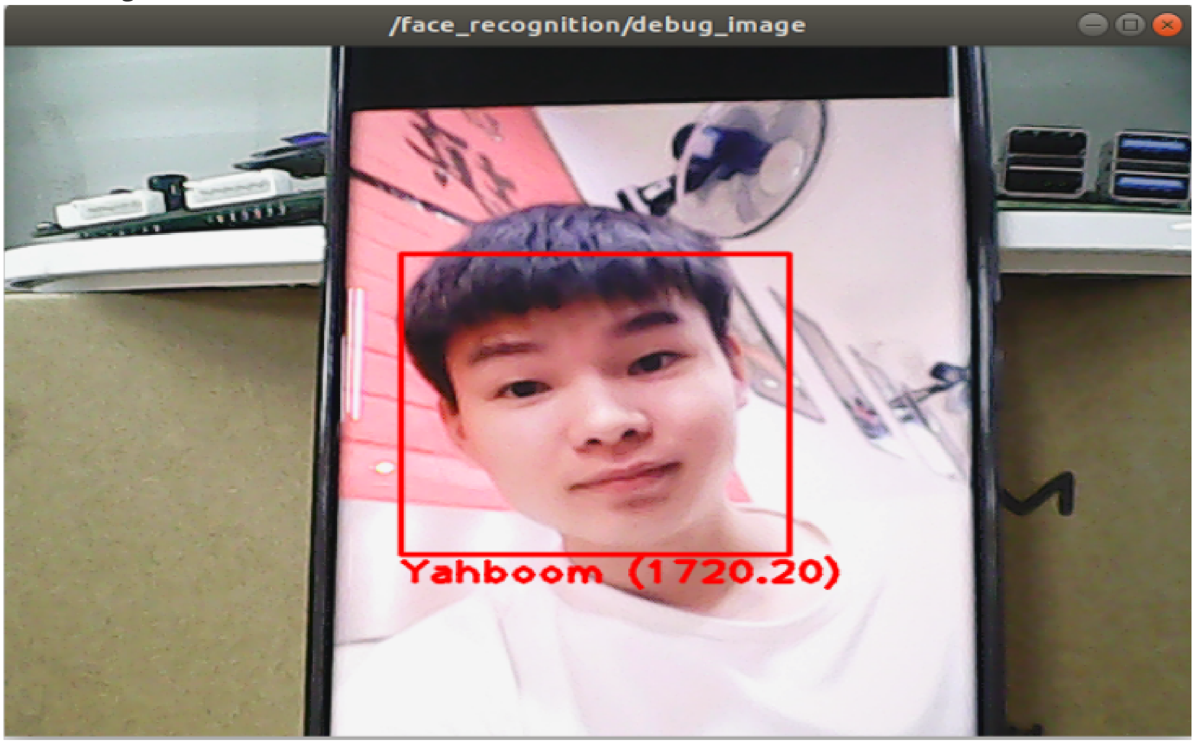


```
Please input your name and press Enter: Yahboom
Your name is Yahboom. Correct? [y/n]: y
Please stand at the center of the camera and press Enter:
taking picture...
One more picture? [y/n]: y
taking picture...
One more picture? [y/n]: y
taking picture...
One more picture? [y/n]: y
taking picture...
One more picture? [y/n]: y
taking picture...
One more picture? [y/n]: y
taking picture...
One more picture? [y/n]: y
taking picture...
One more picture? [y/n]:
```

Step 3: Ensure that faces can be recognized



Final recognition effect


/face_recognition/debug_image
Yahboom (1720.20)