3、Keyboard control

Function package path：~/transbot_ws/src/transbot_ctrl

Input following command to start up:

```
roslaunch transbot_bringup bringup.launch
```

3.1、teleop_twist_keyboard.py

Wiki：http://wiki.ros.org/teleop_twist_keyboard

Source code：https://github.com/ros-teleop/teleop_twist_keyboard

This feature pack can be installed directly into the system.

- Install

```
sudo apt-get install ros-melodic-teleop-twist-keyboard
```

- Run

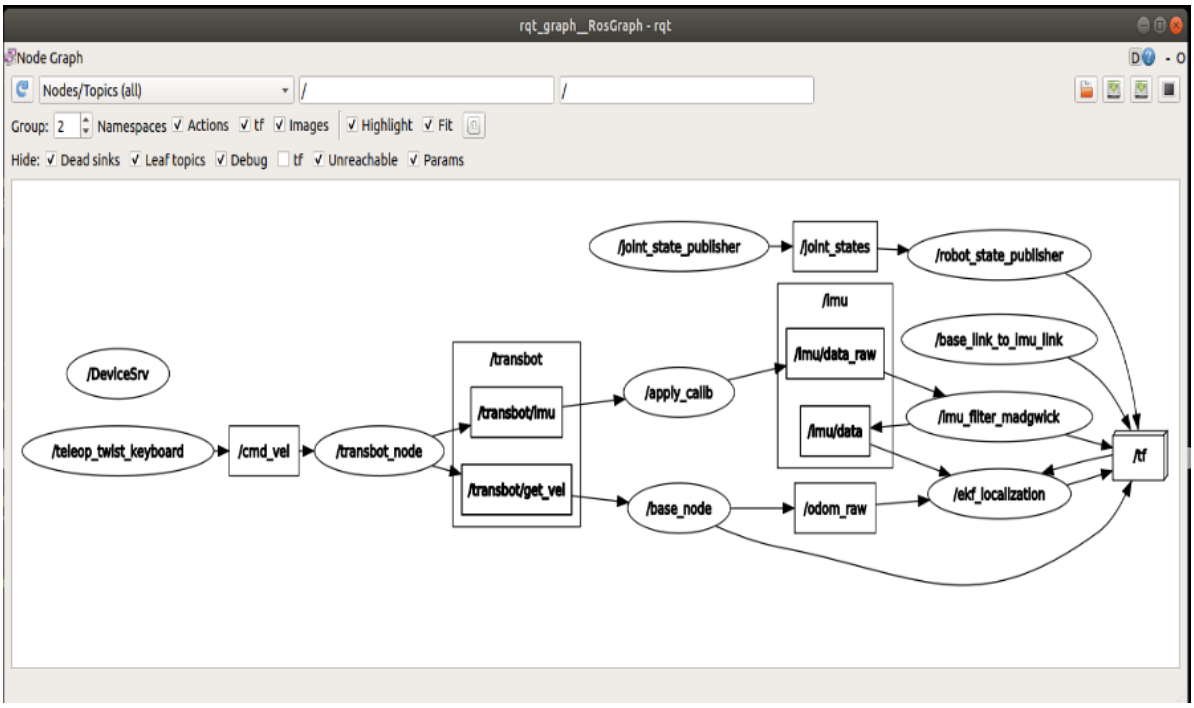
```
rosrun teleop_twist_keyboard teleop_twist_keyboard.py
```

- Control

Key	Car[linear，angular]	Key	Car[linear，angular]
【i】or【I】	【linear，0】	【u】or【U】	【linear，angular】
【,】	【-linear，0】	【o】or【O】	【linear，- angular】
【j】or【J】	【0， angular】	【m】or【M】	【- linear，- angular】
【l】or【L】	【0，- angular】	【.】	【- linear，angular】
Key	**Speed change**	**Key**	**Speed change**
【q】	Linear velocity and angular velocity are both increased by 10%	【z】	linear velocity and angular velocity are both reduced by 10%
【w】	Only the linear velocity increased by 10%	【x】	Only the linear velocity reduced by 10%
【e】	Only the angular velocity increased by 10%	【c】	Only the angular velocity reduced by 10%

Except for the above keys, any key stops the movement. 【Ctrl】+【c】Exit.

```
rqt_graph
```



The node [teleop_twist_keyboard] publishes a message to the topic [/cmd_vel] and is subscribed by the node [/transbot_node].

3.2、transbot_keyboard.py

Note: The key control method is the same as above

Input following command to start up

```
rosrun transbot_ctrl transbot_keyboard.py
roslaunch transbot_ctrl transbot_keyboard.launch
```

Code analysis

Mainly use select module, termios module and tty module

```
import sys, select, termios, tty
```

-The select module is mainly used for socket communication.
-The termios module provides an IO-controlled POSIX call interface for tty
-The tty module is mainly used to change the mode of the file descriptor fd

Get current key information

```
def getKey():
    # tty.setraw():Change the file descriptor fd mode to raw; fileno(): returns
an integer file descriptor (fd)
    tty.setraw(sys.stdin.fileno())
    # select():Directly call the IO interface of the operating system; monitor
all file handles with fileno() method
    rlist, _, _ = select.select([sys.stdin], [], [], 0.1)
    # Read a byte of input stream
    if rlist: key = sys.stdin.read(1)
    else: key = ''
    # tcsetattr sets the tty attribute of the file descriptor fd from the
attribute
    termios.tcsetattr(sys.stdin, termios.TCSADRAIN, settings)
    return key
```

Get speed limit

```
    linear_limit = rospy.get_param('~linear_limit', 0.45)
    angular_limit = rospy.get_param('~angular_limit', 2.0)
```

Control flow

```
            # Get current key information
            key = getKey()
            # Key string to determine whether it is in the dictionary
            if key in moveBindings.keys():
                x = moveBindings[key][0]
                th = moveBindings[key][1]
                count = 0
            # Key string to determine whether it is in the dictionary
            elif key in speedBindings.keys():
                speed = speed * speedBindings[key][0]
                turn = turn * speedBindings[key][1]
                count = 0
```

```
                # speed limit
                if speed > linear_limit: speed = linear_limit
                if turn > angular_limit: turn = angular_limit
                print(vels(speed, turn))
                # Print msg information once accumulated a certain number of
times
                if (status == 14): print(msg)
                status = (status + 1) % 15
            # If the button is '' or'k', then stop the movement
            elif key == ' ': (x, th) = (0, 0)
            else:
                # If it is not a long press, stop this function
                count = count + 1
                if count > 4: (x, th) = (0, 0)
                if (key == '\x03'): break
            # Publish
            twist = Twist()
            twist.linear.x = speed * x
            twist.angular.z = turn * th
            pub.publish(twist)
```