

3.Moves randomly

Follow the previous steps to install the virtual machine. After decompressing the system files, open the virtual machine and use it.

The environment has been set up and the relevant code has been placed in the Ubuntu system, under the file path /home/dofbot/dofbot_ws/src directory.

1. Start robotic arm simulation

- **Starts Virtual machine simulation**

Start MoveIT (virtual machine side)

```
roslaunch dofbot_config demo.launch
```

Open another terminal and enter the command line. (This program is simulated in rviz, the real machine will not move) (Virtual machine side)

```
cd dofbot_ws/  
source devel/setup.bash  
roslaunch dofbot_moveit 01_set_move.py # python file
```

Close case: [ctrl+c] to close. If it cannot be closed, execute [ctrl+z] again.

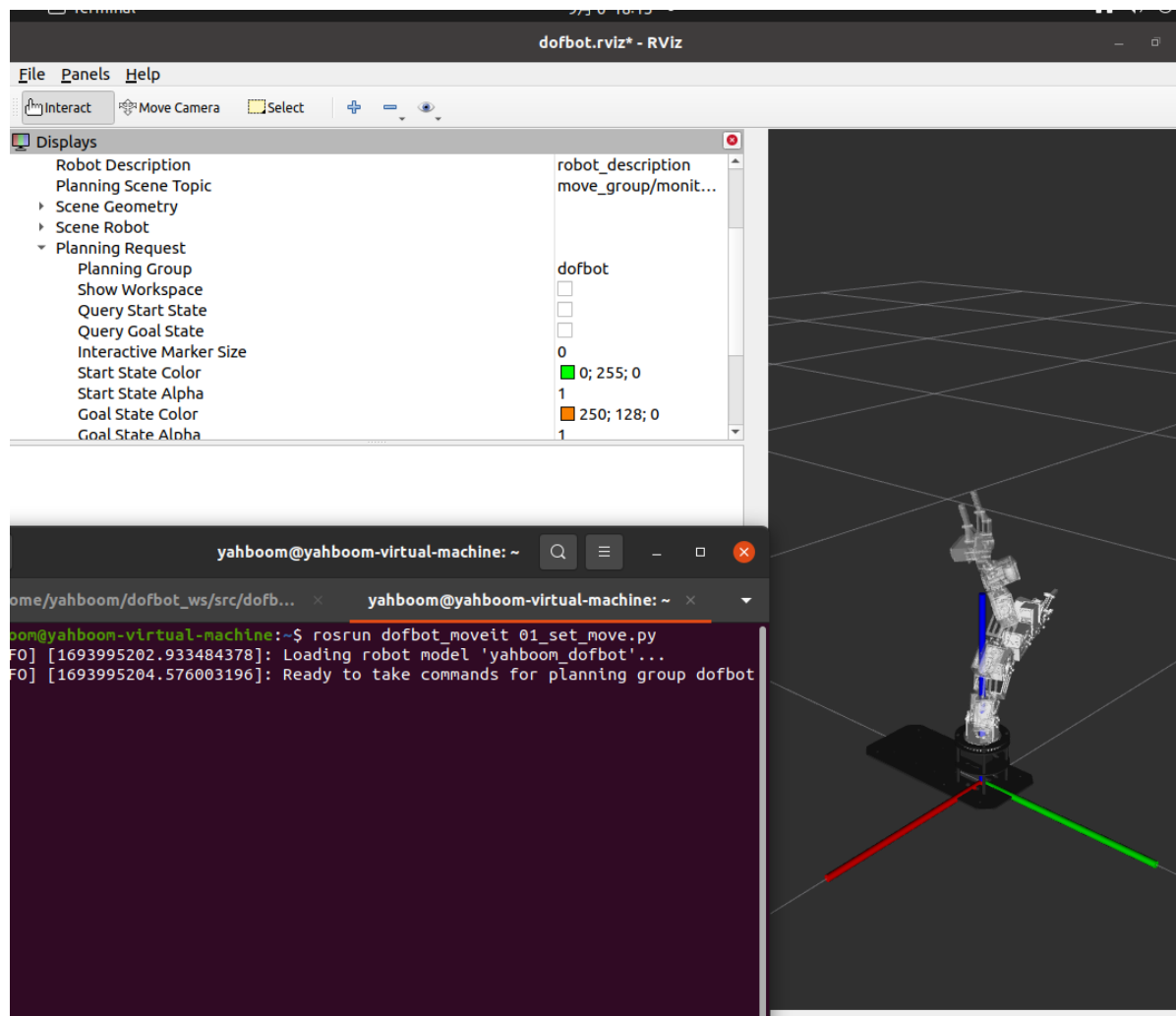
Key part of the program code description:

```
#Import header file  
import rospy  
from moveit_commander.move_group import MoveGroupCommander  
  
#Initialize node  
rospy.init_node("dofbot_random_move")  
#Initialize the robotic arm motion planning group  
dofbot = MoveGroupCommander("dofbot") #Note: The group name here must be  
consistent with the group name in the previous MoveIt configuration, otherwise it  
will be invalid.  
# Set random target points  
dofbot.set_random_target()  
# Set pose  
dofbot.set_named_target("up")  
dofbot.set_named_target("down") #Note: The up and down here are the postures  
set during MoveIt configuration.  
  
# Start exercising  
dofbot.go()  
sleep(0.5)
```

Code path: dofbot_ws/src/dofbot_moveit/scripts/01_set_move.py

Experimental phenomenon:

You can see that the robotic arm in rviz will randomly search for target points and move.



2. Start running on real machine

Robotic arm rviz simulation movement + real machine operation

Note: Because this is a random target point movement, you need to pay attention to whether there are objects near the robot arm

Ctrl+z the previous program or just fork it and open another terminal to enter the command (this program is simulated in rviz plus real machine motion)

```
roslaunch dofbot_moveit 1.py # python file
```

Close case: [ctrl+c] to close. If it cannot be closed, execute [ctrl+z] again.

Key part of the program code description:

```

#Subscribe to the angle of each joint published by moveit
subscriber = rospy.Subscriber("/joint_states", JointState, topic)
#The subscribed angle is calculated and sent to the python driver library
for i in range(6):
    joints[i] = (msg.position[i] * RA2DE) + 90
    if(i == 5):
        joints[i] = (msg.position[i] * 116) + 180
#mobilize driver function
sbus.Arm_serial_servo_write6_array(joints, 100)

```

Code path: dofbot_ws/src/dofbot_moveit/scripts/1.py

Experimental phenomenon: The real robotic arm will move along with the movement of the model in rviz.

