

3. MoveIt moves randomly

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This lesson takes the MoveIT simulation as an example. If you need to set the synchronization between the real machine and the simulation, please refer to the lesson [02, MoveIt Precautions and Controlling the Real Machine]. !!! be careful!!!

The effect demonstration is a virtual machine, and other masters are running (related to the performance of the master, depending on the actual situation).

3.1. Start

Start the MoveIT

```
roslaunch transbot_se_moveit_config demo.launch
```

Start random motion node (choose one of two)

```
roslaunch transbot_se_moveit_config 01_random_move.py # python
roslaunch transbot_se_moveit_config 01_random_move # C++
```

The effect diagram is as follows



The effect of the source code is the same as that of the MoveIT interface [MotionPlanning--->Planning--->Goal State (random)].

3.2. Python source code

Import header file

```
import rospy
from time import sleep
from moveit_commander.move_group import MoveGroupCommander
```

Initialize nodes and create planning group instances

```
# 初始化节点 Initialize node
rospy.init_node("transbot_set_move")
# 初始化机械臂 Initialize the robotic arm
transbot = MoveGroupCommander("arm_group")
```

Set planning parameters

```

# 当运动规划失败后, 允许重新规划 when motion planning fails, re-planning is
allowed
transbot.allow_replanning(True)
transbot.set_planning_time(5)
# 尝试规划的次数 Number of planning attempts
transbot.set_num_planning_attempts(10)
# 设置允许目标位置误差 Set the allowable target position error
transbot.set_goal_position_tolerance(0.01)
# 设置允许目标姿态误差 Set the allowable target attitude error
transbot.set_goal_orientation_tolerance(0.01)
# 设置允许目标误差 Set the allowable target error
transbot.set_goal_tolerance(0.01)
# 设置最大速度 Set maximum speed
transbot.set_max_velocity_scaling_factor(1.0)
# 设置最大加速度 Set maximum acceleration
transbot.set_max_acceleration_scaling_factor(1.0)

```

Loop to set random target points

```

while not rospy.is_shutdown():
    # 设置随机目标点 Set random target points
    transbot.set_random_target()
    # 开始运动 Start
    transbot.go()
    sleep(0.5)

```

3.3. C++ source code

Import header file

```

#include <iostream>
#include "ros/ros.h"
#include <moveit/move_group_interface/move_group_interface.h>

```

Create nodes and planning groups

```

ros::init(argc, argv, "transbot_random_move_cpp");
ros::NodeHandle n;
ros::AsyncSpinner spinner(1);
spinner.start();
moveit::planning_interface::MoveGroupInterface transbot("arm_group");

```

Set planning parameters and initial position

```
// 设置最大速度 Set maximum speed
transbot.setMaxVelocityScalingFactor(1.0);
// 设置最大加速度 Set maximum acceleration
transbot.setMaxAccelerationScalingFactor(1.0);
//设置目标点 Set target point
transbot.setNamedTarget("down");
//开始移动 Start moving
transbot.move();
sleep(0.1);
```

Loop to set random target points

```
while (!ros::isShuttingDown()){
    //设置随机目标点 Set random target points
    transbot.setRandomTarget();
    transbot.move();
    sleep(0.5);
}
```

3.4. Node diagram

Take C++ node as an example

