3. MoveIt moves randomly

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).
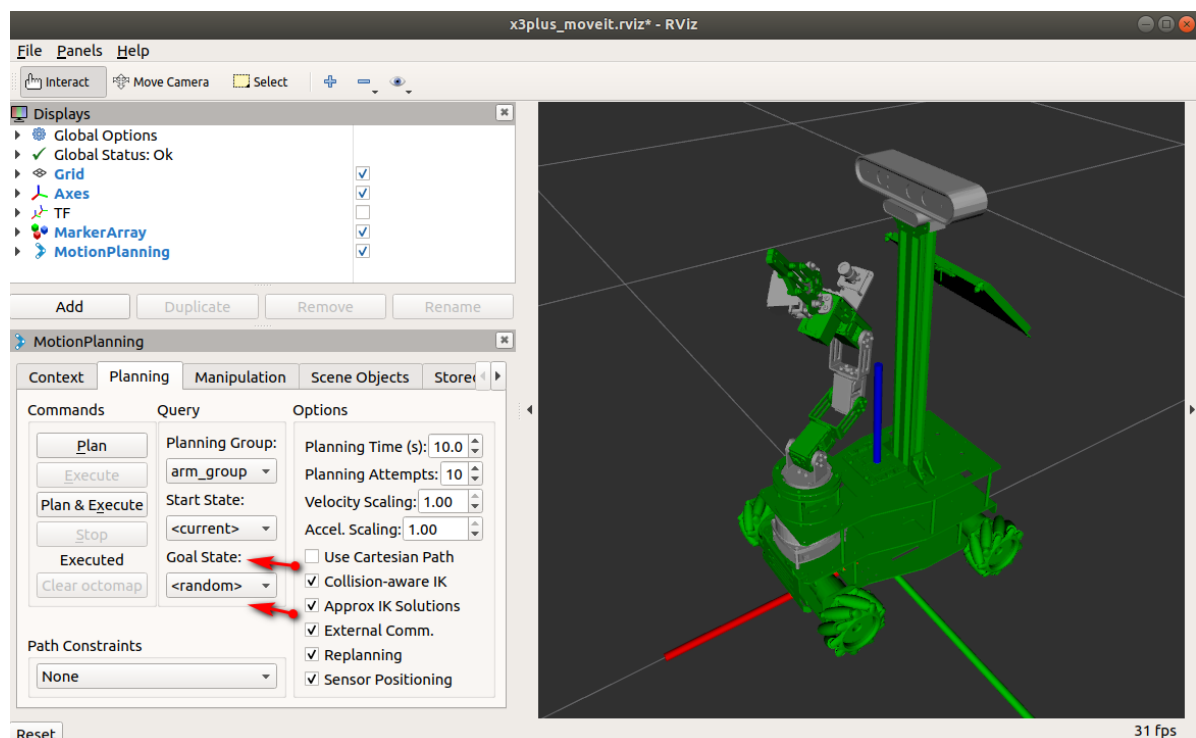
3.2. Start

Start the MoveIT

```
roslaunch arm_moveit_demo x3plus_moveit_demo.launch sim:=true
```

Start random motion node (choose one of two)

```
rosrun arm_moveit_demo 01_random_move.py  # python
rosrun arm_moveit_demo 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

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

Initialize nodes and create planning group instances

```python
    # Initialize node
    rospy.init_node("yahboomcar_random_move")
    # Initialize robotic arm planning group
    yahboomcar = MoveGroupCommander("arm_group")
```

Set planning parameters

```python
    # Allow replanning when motion planning fails
    yahboomcar.allow_replanning(True)
    # Set planning time
    yahboomcar.set_planning_time(5)
    # Number of attempts to plan
    yahboomcar.set_num_planning_attempts(10)
    # Set allowable target position error
    yahboomcar.set_goal_position_tolerance(0.01)
    # Set allowable target pose error
    yahboomcar.set_goal_orientation_tolerance(0.01)
    # Set allowable target error
    yahboomcar.set_goal_tolerance(0.01)
    # Set maximum speed
    yahboomcar.set_max_velocity_scaling_factor(1.0)
    # Set maximum acceleration
    yahboomcar.set_max_acceleration_scaling_factor(1.0)
```

Loop to set random target points

```python
    while not rospy.is_shutdown():
        # Set random target points
        yahboomcar.set_random_target()
        # Start exercising
        yahboomcar.go()
        sleep(0.5)
```

3.3. C++ source code

Import header file

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

Create nodes and planning groups

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

Set planning parameters and initial position

```
    // Set maximum speed
    yahboomcar.setMaxVelocityScalingFactor(1.0);
    // Set maximum acceleration
    yahboomcar.setMaxAccelerationScalingFactor(1.0);
    //Set target point
    yahboomcar.setNamedTarget("down");
    //Start moving
    yahboomcar.move();
    sleep(0.1);
```

Loop to set random target points

```
    while (!ros::isShuttingDown()){
        //Set random target points
        yahboomcar.setRandomTarget();
        yahboomcar.move();
        sleep(0.5);
    }
```

3.4. Node diagram

Take C++ node as an example