

# Moveit Collision Detection

## 1. Usage Environment

Motherboard: Jetson Orin Nano/Nx

ROS2: Humble

## 2. Driving the Real Machine

Driving the real machine is to convert the joint state information of the robot into the control of the real robot by subscribing to the `/joint_states` topic of Moveit2.

**Note: Since the real robot arm does not have an obstacle avoidance function, some positions may hit obstacles; so the planned robot arm movements should be as reasonable as possible and avoid obstacles**

(It is recommended to use preset positions to demonstrate driving the real machine)

### 2.1. Start the real machine

If you do not drive the real machine, simulate the robot arm movements in Moveit:

```
ros2 run jetcobot_driver sync_plan
```

### 2.2. Start Moveit2

```
ros2 launch jetcobot_moveit demo.launch.py
```

```
jetson@yahboom:~/jetcobot_colcon_ws$ source install/setup.bash
jetson@yahboom:~/jetcobot_colcon_ws$ ros2 run jetcobot_driver sync_plan
[INFO] [1746523618.089714205] [mycobot_receiver]: Connected to MyCobot at /dev/ttyUSB0, baud: 1000000
```

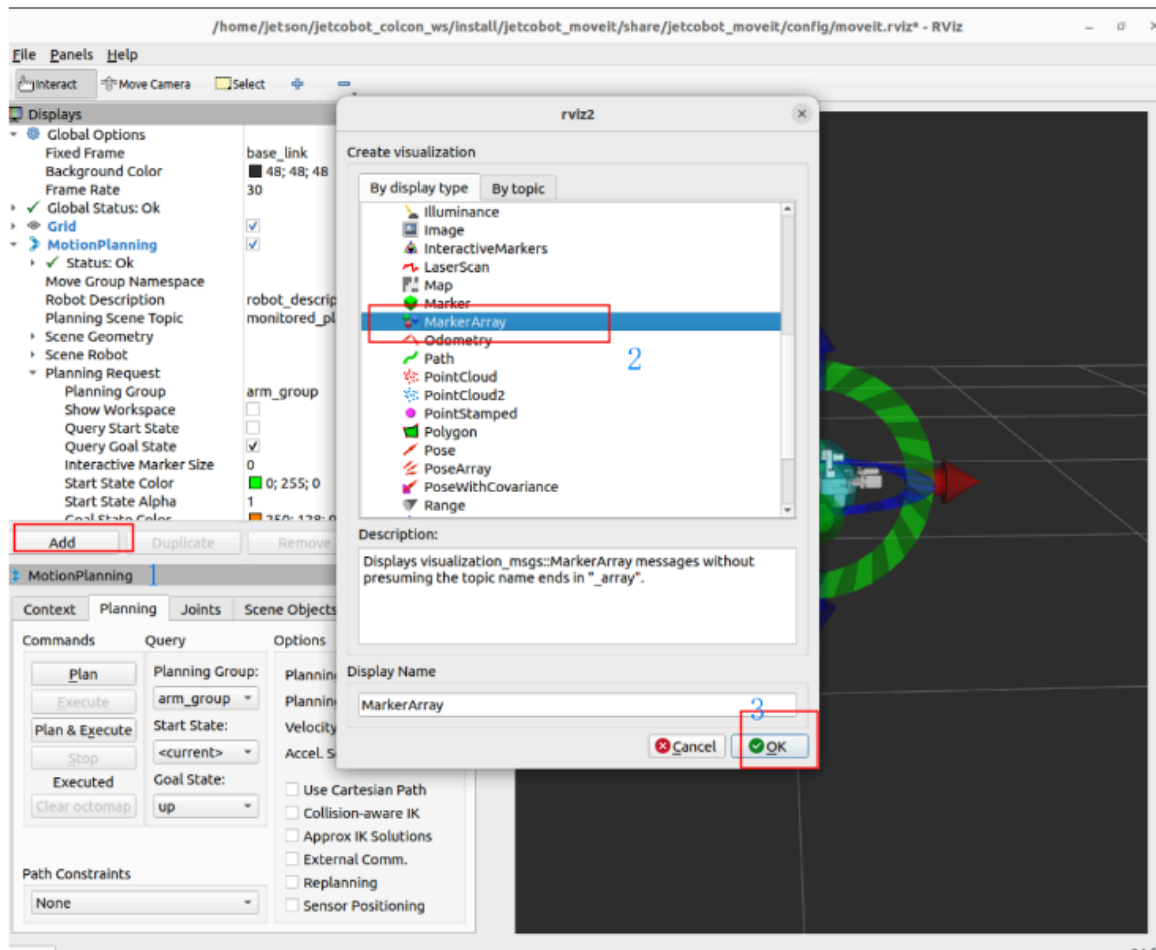
```
jetson@yahboom:~$ ros2 launch jetcobot_moveit demo.launch.py
[INFO] [launch]: All log files can be found below /home/jetson/.ros/log/2025-05-06-18-22-35-906299-yahboom-5757
[INFO] [launch]: Default logging verbosity is set to INFO
[INFO] [static_transform_publisher-1]: process started with pid [5758]
[INFO] [robot_state_publisher-2]: process started with pid [5760]
[INFO] [move_group-3]: process started with pid [5762]
[INFO] [rviz2-4]: process started with pid [5764]
[INFO] [ros2_control_node-5]: process started with pid [5766]
[INFO] [spawner-6]: process started with pid [5768]
[INFO] [spawner-7]: process started with pid [5770]
[static_transform_publisher-1] [INFO] [1746526957.078854709] [static_transform_publisher0]: Spinning until stopped - publishing transform
[static_transform_publisher-1] translation: ('0.000000', '0.000000', '0.000000')
[static_transform_publisher-1] rotation: ('0.000000', '0.000000', '0.000000', '1.000000')
[static_transform_publisher-1] from 'world' to 'base_link'
[ros2_control_node-5] [WARN] [1746526957.111454920] [controller_manager]: [Deprecated] Passing the robot description parameter directly to the control_manager n
```

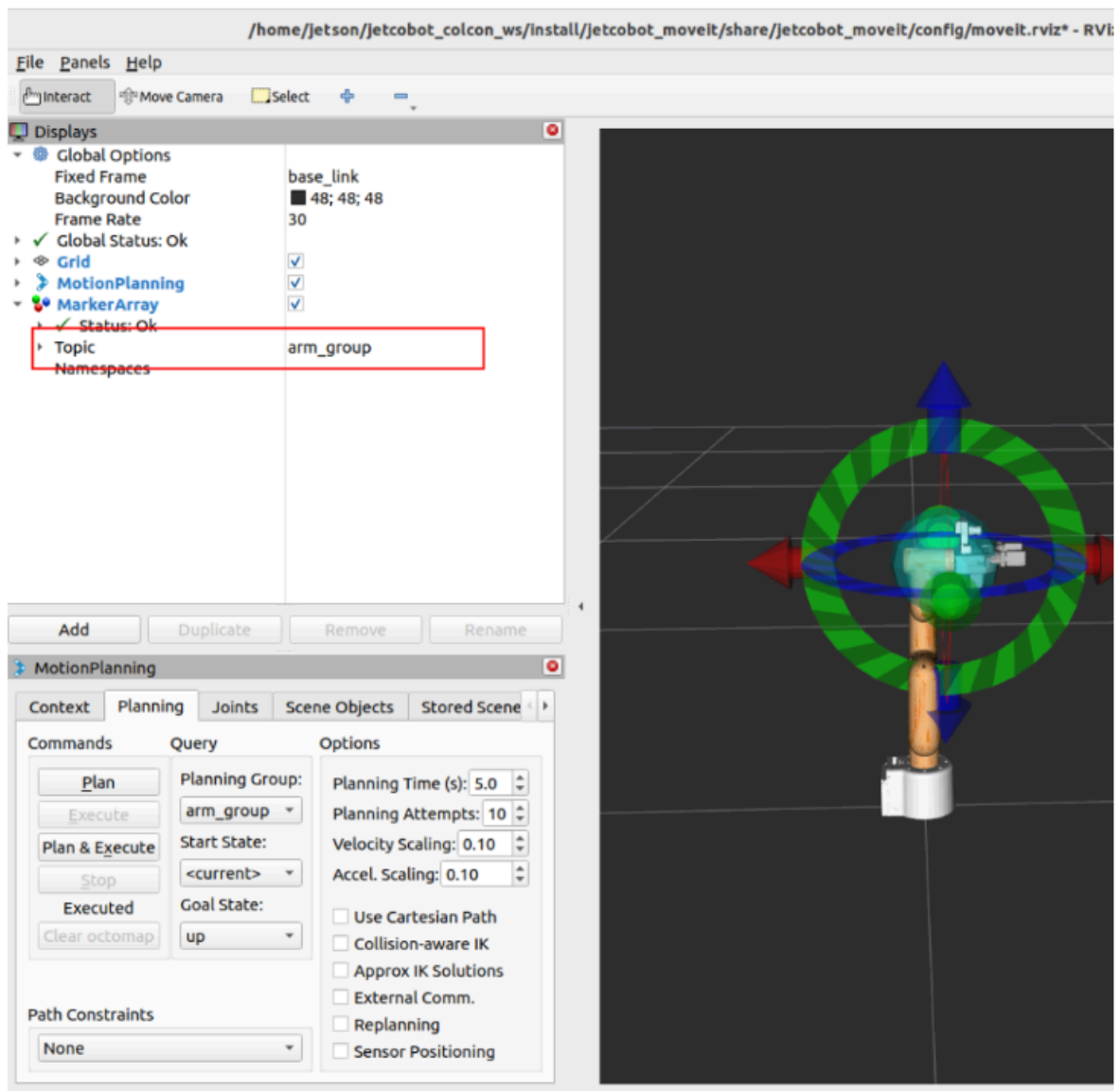
### 3. Collision detection

After the program runs, RViz2 will add a rectangular obstacle next to the robot arm, and the robot arm will be planned to the program target position. The entire planning and execution process will automatically avoid obstacles.

#### 3.1, Visualization

Before starting the command, you need to add the `MarkerArray` plug-in in `RViz2` to display the planned path: `MarkerArray` needs to select the `arm_group` topic





## 3.2, Start the command

The robot needs to be successfully loaded in MoveIt and `you can start planning now!` appears to run the following command: The robot will automatically avoid the rectangular planning and execute to the specified position

```
ros2 run jetcobot_moveit obstacle_avoidance
```

```

nk' does not match the URDF frame 'dummy'
[INFO] [1746529919.293309135] [moveit_robot_model.robot_model]: No root/virtual joint specified in SRDF. Assuming fixed joint
[WARN] [1746529919.537459572] [moveit_ros.robot_model_loader]: No kinematics plugins defined. Fill and load kinematics.yaml!
[INFO] [1746529919.561392114] [move_group_interface]: Ready to take commands for planning group arm_group.
[INFO] [1746529919.577959246] [random_target_move]: Add an object into the world
[INFO] [1746529919.578686245] [move_group_interface]: MoveGroup action client/server ready
[INFO] [1746529919.579893258] [move_group_interface]: Planning request accepted
[INFO] [1746529919.605930121] [move_group_interface]: Planning request complete!
[INFO] [1746529919.606791747] [move_group_interface]: time taken to generate plan: 0.0169293 seconds
[INFO] [1746529919.606864358] [random_target_move]: Planning succeeded, moving the arm.
[INFO] [1746529919.607901413] [move_group_interface]: Execute request accepted
[INFO] [1746529919.607921453] [move_group_interface]: Execute request success!
[INFO] [1746529919.606291390] [move_group_interface]: MoveGroup action client/server ready
[INFO] [1746529919.697995602] [move_group_interface]: Planning request accepted
[INFO] [1746529920.039394176] [move_group_interface]: Planning request aborted
[ERROR] [1746529920.039985714] [move_group_interface]: MoveGroupInterface::plan() failed or timeout reached
[INFO] [1746529920.040090261] [random_target_move]: Planning failed!
[INFO] [1746529920.040407135] [move_group_interface]: MoveGroup action client/server ready
[INFO] [1746529920.041837131] [move_group_interface]: Planning request accepted
[INFO] [1746529920.301183938] [move_group_interface]: Planning request aborted
[ERROR] [1746529920.301759988] [move_group_interface]: MoveGroupInterface::plan() failed or timeout reached
[INFO] [1746529920.301821366] [random_target_move]: Planning failed!
[INFO] [1746529920.302108670] [move_group_interface]: MoveGroup action client/server ready
[INFO] [1746529920.303514570] [move_group_interface]: Planning request accepted
[INFO] [1746529920.426246208] [move_group_interface]: Planning request aborted
[ERROR] [1746529920.426394501] [move_group_interface]: MoveGroupInterface::plan() failed or timeout reached
[INFO] [1746529920.426518056] [random_target_move]: Planning failed!
[INFO] [1746529920.426877044] [move_group_interface]: MoveGroup action client/server ready
[INFO] [1746529920.430300797] [move_group_interface]: Planning request accepted
[INFO] [1746529920.564936385] [move_group_interface]: Planning request complete!
[INFO] [1746529920.565471601] [move_group_interface]: time taken to generate plan: 0.111855 seconds
[INFO] [1746529920.565612373] [random_target_move]: Planning succeeded, moving the arm.
[INFO] [1746529920.567144836] [move_group_interface]: Execute request accepted
[INFO] [1746529920.956115825] [move_group_interface]: Execute request success!
[INFO] [1746529920.957005932] [move_group_interface]: MoveGroup action client/server ready
[INFO] [1746529920.958151951] [move_group_interface]: Planning request accepted
[INFO] [1746529920.107451542] [move_group_interface]: Planning request complete!
[INFO] [1746529920.107905860] [move_group_interface]: time taken to generate plan: 0.121054 seconds
[INFO] [1746529920.108132747] [random_target_move]: Planning succeeded, moving the arm.
[INFO] [1746529920.108815934] [move_group_interface]: Execute request accepted
[INFO] [1746529920.797716745] [move_group_interface]: Execute request success!

```

