ROS 伺服运动使用说明

1. 版本信息：

机器人型号	JAKA Zu7
控制器版本	1.5.12_28_X64
SDK	2.1.2
ROS	Melodic
Ubuntu	18.04

2. 功能说明：

通过 ROS1 话题通信的方式，实现关节空间下的 Servo 增量运动。

3. 代码说明：

核心的代码文件是 jaka_driver.cpp 和 servo_j_INCR.cpp

在 jaka_ros 功能包内的文件位置分别为：

jaka_ros/jaka_robot/src/jaka_driver/src/jaka_driver.cpp

jaka_ros/jaka_robot/src/jaka_driver/src/servo_j_INCR.cpp

关键代码说明详见两个文件的注释部分。

4. 操作步骤：

（1） 修改功能包（jaka_driver）的 launch 文件夹下的 robot_start_launch.launch 文件中的机器人 IP 地址(与实际机器人 IP 地址保持一致)，如图：

```
<launch>
    <param name="ip" value="172.30.2.144" type="str"/>
    <node pkg="jaka_driver" type="jaka_driver" name="jaka_driver" output="screen" launch-prefix="xterm -e gdb -ex run --args" />
</launch>
```

（2） 修改功能包（jaka_driver）的 src 文件夹下 servo_j_INCR.cpp 文件中导入的运动规划路径文件（j_INCR.csv）为绝对路径。

```
ifstream infile("/home/whm/jaka_robot/src/jaka_driver/src/j_INCR.csv", ios::in);
    string line;
    vector<struct Position> posVector;
    // getline(infile, line);
    while (getline(infile, line)) {
```

（3） 修改功能包（jaka_driver）的 src 文件夹下 jaka_driver.cpp 文件中 servocallback 函数的 MoveMode 为 INCR 运动。

```
void servocallback(const jaka_msgs::Servo &request)
{
  //printf("joint1:%f",request.pose[0]);
  JointValue joint_pose;
  joint_pose.jVal[0] = request.pose[0];
  joint_pose.jVal[1] = request.pose[1];
  joint_pose.jVal[2] = request.pose[2];
  joint_pose.jVal[3] = request.pose[3];
  joint_pose.jVal[4] = request.pose[4];
  joint_pose.jVal[5] = request.pose[5];
  // int ret = robot.servo_j(&joint_pose, MoveMode::ABS);
  int ret = robot.servo_j(&joint_pose, MoveMode::INCR);
}
```

（4） 在工作空间（jaka_robot）右键打开一个终端，使用 catkin_make 编译文件。

```
whm@whm-virtual-machine:~/jaka_robot$ catkin_make
Base path: /home/whm/jaka_robot
Source space: /home/whm/jaka_robot/src
Build space: /home/whm/jaka_robot/build
Devel space: /home/whm/jaka_robot/devel
Install space: /home/whm/jaka_robot/install
####
#### Running command: "make cmake_check_build_system" in "/home/whm/jaka_robot/b
uild"
####
####
#### Running command: "make -j4 -l4" in "/home/whm/jaka_robot/build"
####
[  0%] Built target std_msgs_generate_messages_nodejs
[  0%] Built target _jaka_msgs_generate_messages_check_deps_SetUserFrame
[  0%] Built target _jaka_msgs_generate_messages_check_deps_ServoMoveEnable
[  0%] Built target _jaka_msgs_generate_messages_check_deps_RobotMsg
[  0%] Built target _jaka_msgs_generate_messages_check_deps_SetTcpFrame
[  0%] Built target _jaka_msgs_generate_messages_check_deps_ClearError
[  0%] Built target _jaka_msgs_generate_messages_check_deps_GetIK
```

（5） 在工作空间（jaka_robot）终端添加环境变量。

source ./devel/setup.bash

```
whm@whm-virtual-machine:~/jaka_robot$ source ./devel/setup.bash
```

（6） 启动 robot_start_launch.launch 文件：

roslaunch jaka_driver robot_start_launch.launch

```
whm@whm-virtual-machine:~/jaka_robot$ source ./devel/setup.bash
whm@whm-virtual-machine:~/jaka_robot$ roslaunch jaka_driver robot_start_launch.l
aunch
... logging to /home/whm/.ros/log/166caa6e-6556-11ed-a6b2-000c29cf701f/roslaunch
-whm-virtual-machine-40300.log
Checking log directory for disk usage. This may take a while.
Press Ctrl-C to interrupt
Done checking log file disk usage. Usage is <1GB.

started roslaunch server http://whm-virtual-machine:39167/

SUMMARY
========

PARAMETERS
 * /ip: 172.30.2.144
 * /rosdistro: melodic
 * /rosversion: 1.14.13
```
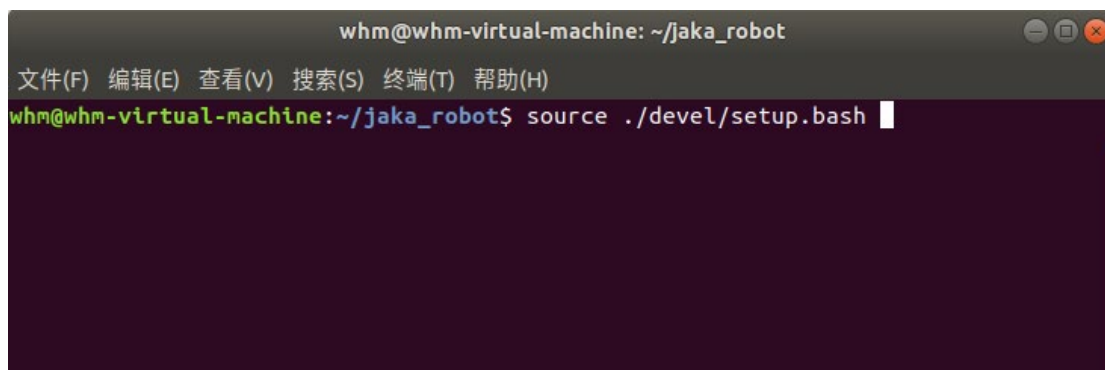
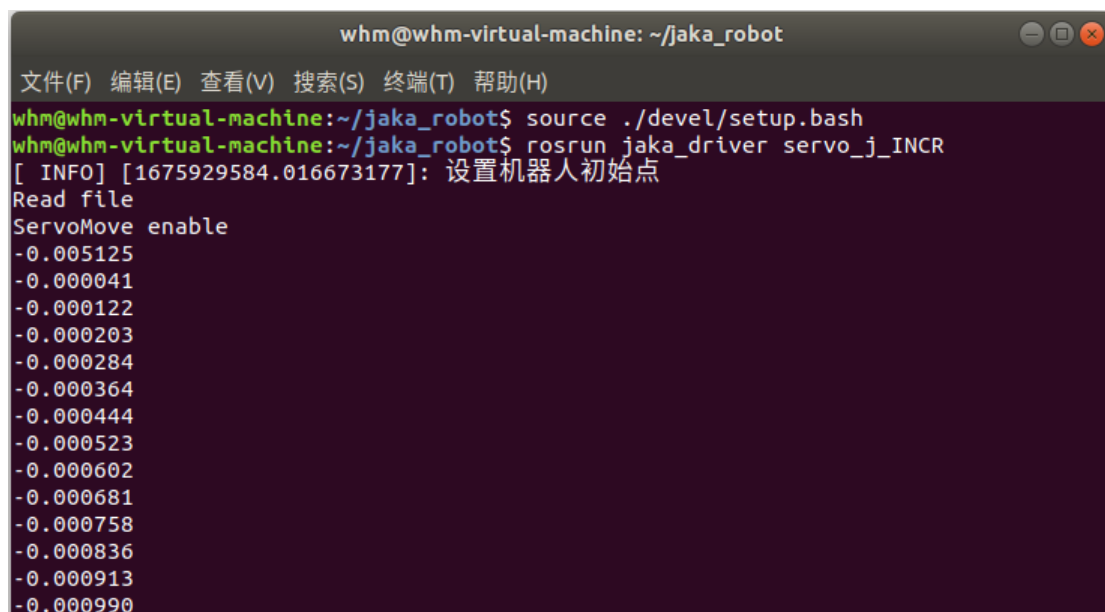（7） 在工作空间（jaka_robot）右键新打开一个终端，然后添加环境变量。

source ./devel/setup.bash

（8） 启动 servo_j_INCR 文件。

rosrun jaka_driver servo_j_INCR