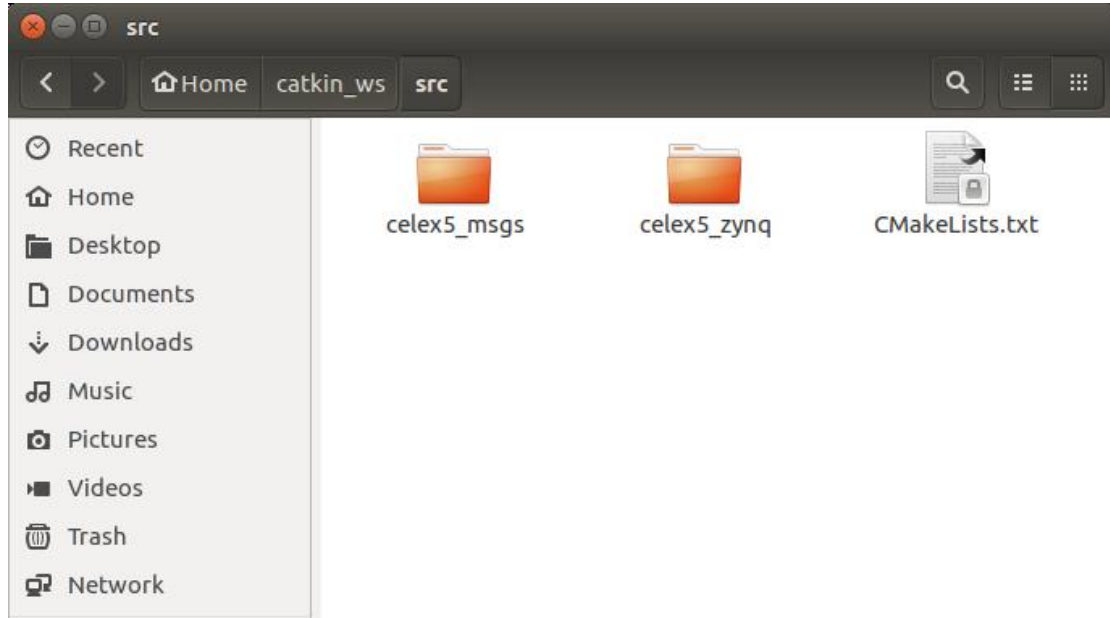
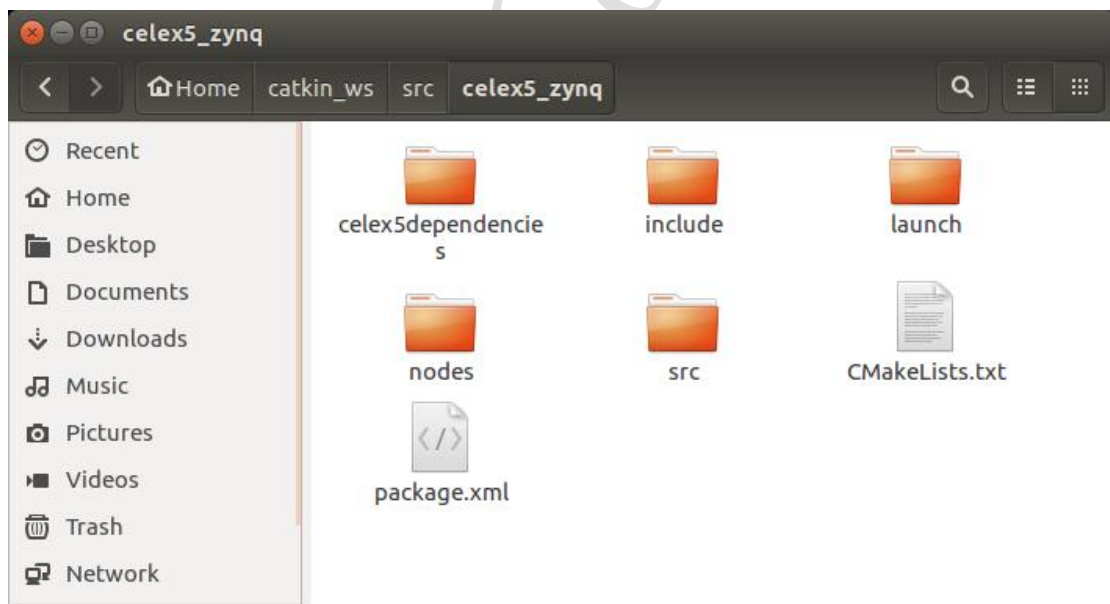


1 介绍

ROS 环境下示例代码文件位于发布目录“**Sample-ROS**”下，主要包括两个 Package 包（celex5_msgs 和 celex5_zynq），其中 celex5_msgs 包是自定义 ROS 消息包，celex5_zynq 包是 CeleX5 功能包。



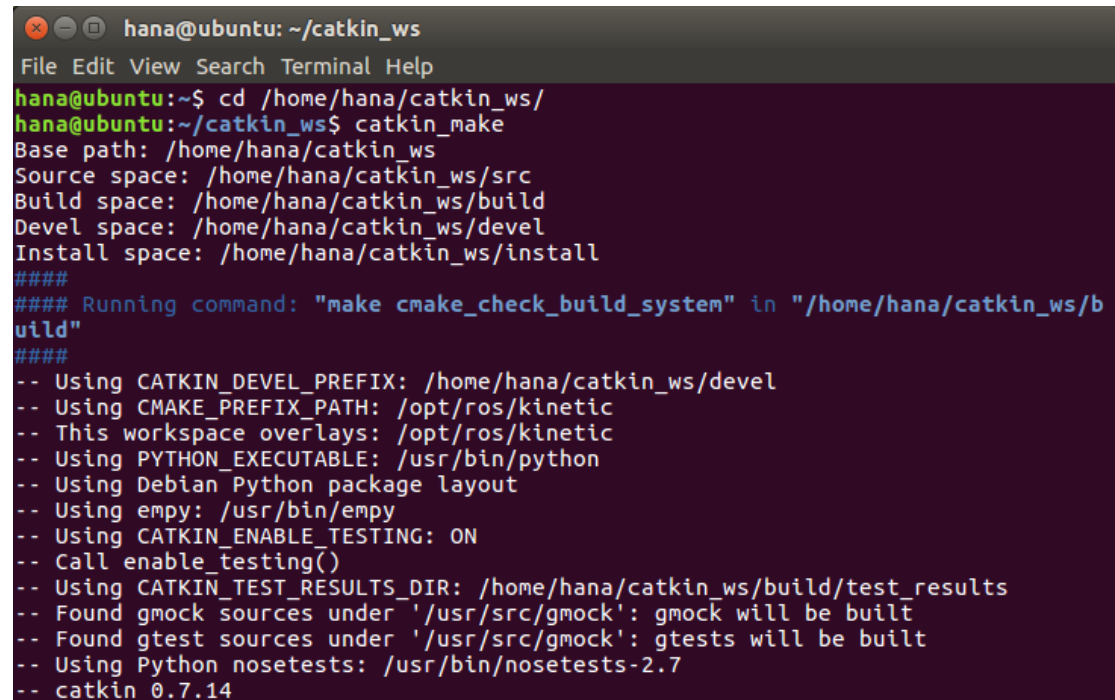
CeleX5 功能包中包括如下五个文件夹及文件：



- ✧ celex5dependencies: 该文件夹中包括 API 头文件及库文件（Ubuntu 16.04）。
- ✧ include: 该文件夹存放的是功能包头文件。
- ✧ launch: 该文件中存放 roslaunch 启动文件。
- ✧ nodes: 该文件夹存放 rosrund 的启动节点文件。
- ✧ src: 该文件夹中存放功能包的源文件。
- ✧ CMakeLists.txt: 用于可执行文件的编译。
- ✧ Package.xml: 描述功能包的属性。

2 CeleX5 功能包的编译

ZYNQ 功能包的编译需要将 `celex5_msgs` 和 `celex5_zynq` 文件放置到创建好的 ROS 工作空间中的 `src` 目录下。如下图所示，当前的 ROS 工作空间名为 `catkin_ws`，进到工作空间中使用 `catkin_make` 命令，即可编译 `src` 目录下所有 catkin 工程。(注：编译依赖 OpenCV，用户需要自行配置 Ubuntu 下的 OpenCV 环境，本示例使用的是 OpenCV 3.3.0 版本)



```
hana@ubuntu: ~/catkin_ws
File Edit View Search Terminal Help
hana@ubuntu:~$ cd /home/hana/catkin_ws/
hana@ubuntu:~/catkin_ws$ catkin_make
Base path: /home/hana/catkin_ws
Source space: /home/hana/catkin_ws/src
Build space: /home/hana/catkin_ws/build
Devel space: /home/hana/catkin_ws/devel
Install space: /home/hana/catkin_ws/install
####
#### Running command: "make cmake_check_build_system" in "/home/hana/catkin_ws/build"
####
-- Using CATKIN_DEVEL_PREFIX: /home/hana/catkin_ws/devel
-- Using CMAKE_PREFIX_PATH: /opt/ros/kinetic
-- This workspace overlays: /opt/ros/kinetic
-- Using PYTHON_EXECUTABLE: /usr/bin/python
-- Using Debian Python package layout
-- Using empy: /usr/bin/empy
-- Using CATKIN_ENABLE_TESTING: ON
-- Call enable_testing()
-- Using CATKIN_TEST_RESULTS_DIR: /home/hana/catkin_ws/build/test_results
-- Found gmock sources under '/usr/src/gmock': gmock will be built
-- Found gtest sources under '/usr/src/gmock': gtests will be built
-- Using Python nosetests: /usr/bin/nosetests-2.7
-- catkin 0.7.14
```

3 CeleX5 功能包的运行

在运行 ROS 包之前，首先要先运行 `roscore`。然后，我们可以利用 `roslaunch` 或者 `roslaunch` 来运行节点。ROS 作为客户端会等待 ZYNQ 服务器端的网络连接（服务器默认 IP 地址为 192.168.1.11，用户须将客户端设备 IP 配置到同一网段下）。

```
hana@ubuntu: ~/catkin_ws
hana@ubuntu:~/catkin_ws$ source ./devel/setup.bash
hana@ubuntu:~/catkin_ws$ rosruncellex5_zynqcellex5
cellex5datamanager.h          cellex5_ros_node.cpp
cellex5.h                     cellex5_zynq_callback.launch
cellex5processeddata.h       cellex5_zynq_callback_node
cellex5_ros_callback_node.cpp cellex5_zynq.launch
cellex5_ros.cpp              cellex5_zynq_node
cellex5_ros.h
hana@ubuntu:~/catkin_ws$ rosruncellex5_zynqcellex5_zynq_node
XBase::getApplicationDirPath: readlink count = 59
create socket successfully!
connect failed, try to connect again, please wait...
connect failed, try to connect again, please wait...
connect failed, try to connect again, please wait...
connect failed, try to connect again, please wait...
connect failed, try to connect again, please wait...
connect failed, try to connect again, please wait...
connect failed, try to connect again, please wait...
connect failed, try to connect again, please wait...
connect failed, try to connect again, please wait...
connect failed, try to connect again, please wait...
connect failed, try to connect again, please wait...
connect failed, try to connect again, please wait...
connect failed, try to connect again, please wait...
```

如果出现 package *** not found 或者是 tab 不出 rosruncellex5_zynqcellex5_zynq_node 等命令时，可以使用 `source ./devel/setup.bash` 刷新环境。

```
hana@ubuntu: ~/catkin_ws
hana@ubuntu:~/catkin_ws$ roslaunchcellex5_zynqcellex5_zynq.launch
... logging to /home/hana/.ros/log/e88d70dc-8e7c-11e9-a37e-000c29870e43/roslaunch
h-ubuntu-21594.log
Checking log directory for disk usage. This may take awhile.
Press Ctrl-C to interrupt
Done checking log file disk usage. Usage is <1GB.

started roslaunch server http://ubuntu:44119/

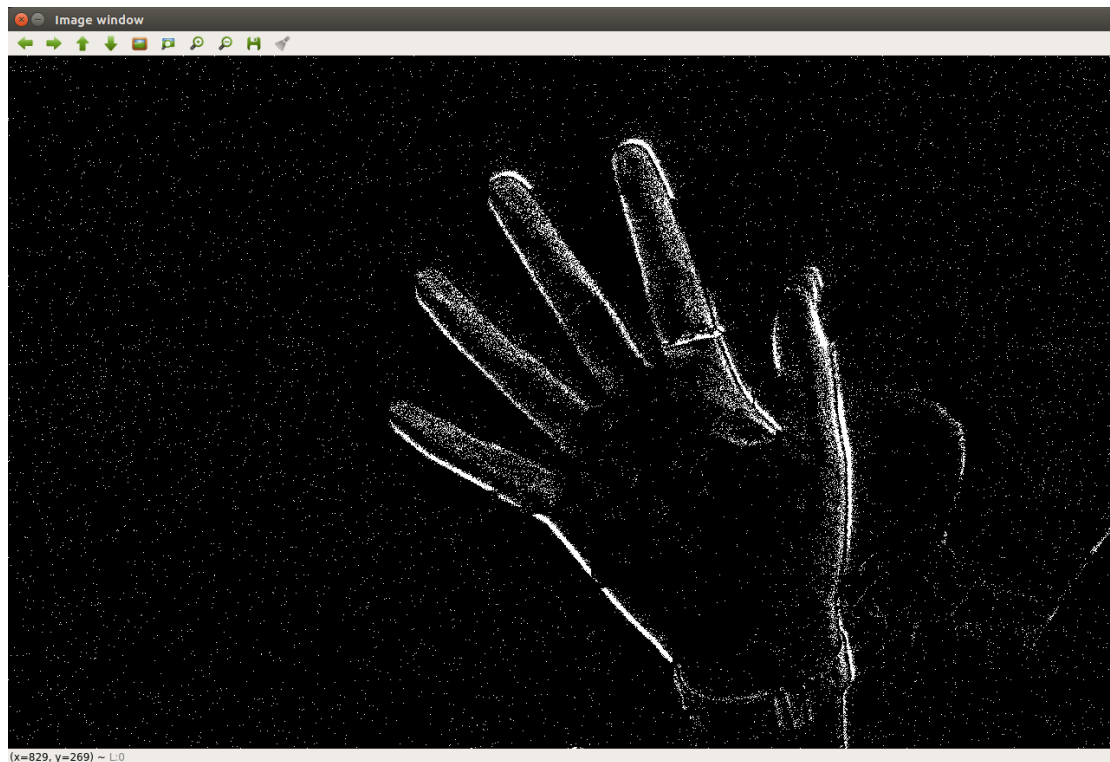
SUMMARY
=====

PARAMETERS
* /cellex5_zynq/cellex_mode: Event_Address_Onl...
* /cellex5_zynq/clock_rate: 100
* /cellex5_zynq/threshold: 170
* /rostdistro: kinetic
* /rosversion: 1.12.14

NODES
/
  cellex5_zynq (cellex5_zynq/cellex5_zynq_node)

ROS_MASTER_URI=http://localhost:11311
```

如果 socket 连接成功，运行后成功可以看到图像窗口。



也可以通过 rviz 订阅查看/imgshow 发布的图像信息。

