



XVSDK-Viewer_User_Guide

Rev1.0

上海詮视传感技术有限公司

Xvisio Technology (Shanghai) Co., Ltd.

History Versions

Version	Descriptions	Author
1.0	Initial version	Xvisio

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1. Overview

This document mainly describes how to install and run XVSDK-Viewer. Currently XVSDK-Viewer supports three OS platforms: Ubuntu, Windows and Android.

2. Ubuntu Platform

2.1 Config Ubuntu DFU Environment

1) Open terminal and input "lsusb -vvv":



Figure 2-1 Input“lsusb -vvv”

2) Press“enter” button, the interface descriptor is shown as below:



Figure 2-2 Interface Descriptor

3) Open a new terminal (don't close the terminal of step2) and input“sudo gedit /etc/udev/rules.d/50-myusb.rules”.

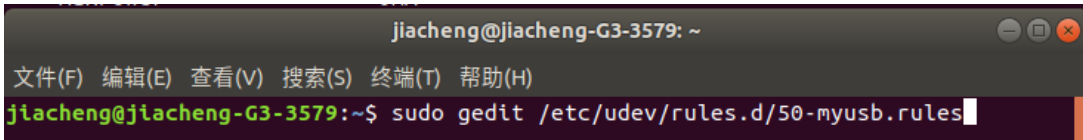


Figure2-3 Open a New Terminal

4) A text document will show after pressing“enter” button. Repeat copy “SUBSYSTEMS=="usb",ATTRS{idVendor}=="1a86",ATTRS{idProduct}=="7523", GROUP="users", MODE="0666"” into the text document.

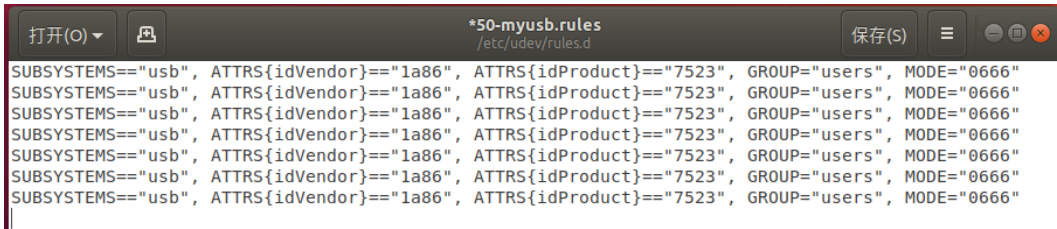


Figure 2-4 A Text Document

5) Back to the terminal of setp1. Find the two code which behind "idVendor" and "idProduct", and then modify the correspond code into the above text document.

For example: "idVendor 0xAAAA Sunplus Innovation Technology Inc. idProduct 0xBBBB", the command in the text should be modified to “SUBSYSTEMS=="usb",ATTRS{idVendor}=="AAAA",ATTRS{idProduct}=="BBBB", GROUP="users", MODE="0666"”.

Note: it only needs to be changed in the case of “idvendedor” and “idproduct” that appear in two consecutive lines, otherwise no need to change.

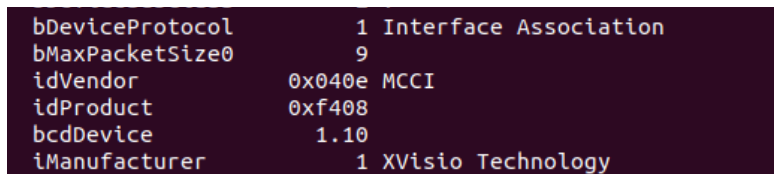


Figure 2-5 "idvendedor"&"idproduct"

6) After modification:



Figure 2-6 Modification Finished

7) Deleted unnecessary commands, save and exit.

Note: if the command window pops up in step 2 instead of text document, you need to enter “wq!” to save and exit.

8) Open terminal and input “*sudo udevadm control --reload*” to reload udev rule. And then input “*sudo apt-get install dfu-util*” to install driver.

```
jlacheng@jlacheng-G3-3579:~$ sudo udevadm control --reload
jlacheng@jlacheng-G3-3579:~$ sudo apt-get install dfu-util
正在读取软件包列表... 完成
正在分析软件包的依赖关系树
正在读取状态信息... 完成
下列软件包是自动安装的并且现在不需要了:
linux-hwe-5.4-headers-5.4.0-42 linux-hwe-5.4-headers-5.4.0-77
使用 'sudo apt autoremove' 来卸载它(它们)。
下列【新】软件包将被安装:
  dfu-util
升级了 0 个软件包, 新安装了 1 个软件包, 要卸载 0 个软件包, 有 93 个软件包未被升级。
需要下载 33.1 kB 的归档。
解压缩后会消耗 118 kB 的额外空间。
获取#1 http://cn.archive.ubuntu.com/ubuntu.com/ubuntu bionic/universe amd64 dfu-util amd64
0.9-1 [33.1 kB]
已下载 33.1 kB, 耗时 1秒 (31.3 kB/s)
正在选中未选择的软件包 dfu-util。
(正在读取数据库 ... 系统当前共安装有 251790 个文件和目录。 )
准备解包 .../dfu-util_0.9-1_amd64.deb ...
正在解包 dfu-util (0.9-1) ...
正在设置 dfu-util (0.9-1) ...
正在处理用于 man-db (2.8.3-2ubuntu0.1) 的触发器 ...
jlacheng@jlacheng-G3-3579:~$
```

Figure 2-7 Install Driver

2.2 Install Ubuntu SDK Tool

1) Get latest installation package:

Installation package 1: *xv sdk_3.2.0-2022xxxx_ amd64.snap*

Installation package 2:

xv sdk_3.2.0-2022xxxx_ bionic_ amd64 (for Ubuntu 18.04)

xv sdk_3.2.0-2022xxxx_ focal_ amd64 (for Ubuntu 20.04)

2) Copy to system table file;

3) If user have previously installed *xv sdk-viewer* using *snap*, please uninstall *xv sdk-viewer* under the *snap* directory first.

➤ Check all the *snap* package to find out *xv sdk-viewer*.

cmd: *sudo snap list*

➤ Delete *xv sdk-viewer*.

cmd: *sudo snap remove xv sdk-viewer*

➤ Check *setp4* for re-install commands.

4) Install *Snap* package

```
cmd: sudo snap install --devmode xvsdk_3.2.0-2022xxxx_amd64.snap
```

5) Install Deb

```
cmd : sudo dpkg -i xvsdk_3.2.0-2022xxxx_bionic_amd64(or xvsdk_3.2.0-2022xxxx_focal_amd64)
```

Note: double click Deb may cause unnormal issue because of uncompleted system environment. User can use command to install.

6) Open a new terminal to input command “xv sdk-viewer” to run viewer.

7) Open a new terminal to input command “all_stream” to open all the camera.

3. Windows Platform

Refer to the below document to configure Windows system environment DFU.



XvisioUpgradeTo
ol_User_Guide_EF

Figure 3-1 Reference Document

DFU driver package:



DFU_Interface_for
flash_memory_l

Figure 3-2 DFU Driver Package

3.1 Install Windows SDK

1) Get install package of xv sdk-viewer and SDK.

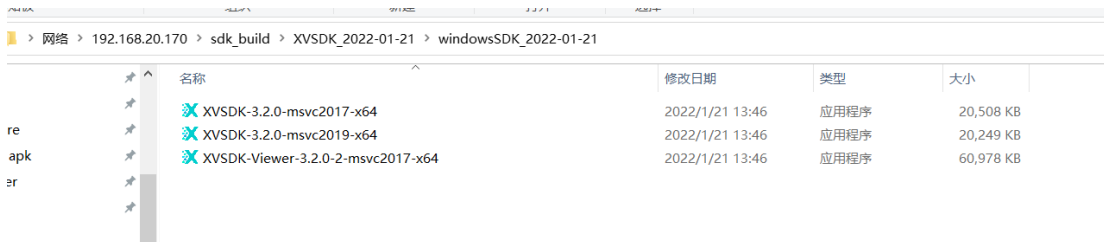


Figure 3-3 SDK Installation Package

2) Click “windows” button to find out xv sdk-viewer program and click it.

3) Find out SDK installation catalogue (usually default to C:\Program Files\xv sdk\bin).

Double click "all_stream" which indicates all the camera have been started.

4. Android Platform

1) Get Android APK in the same catalogue of Daily build.

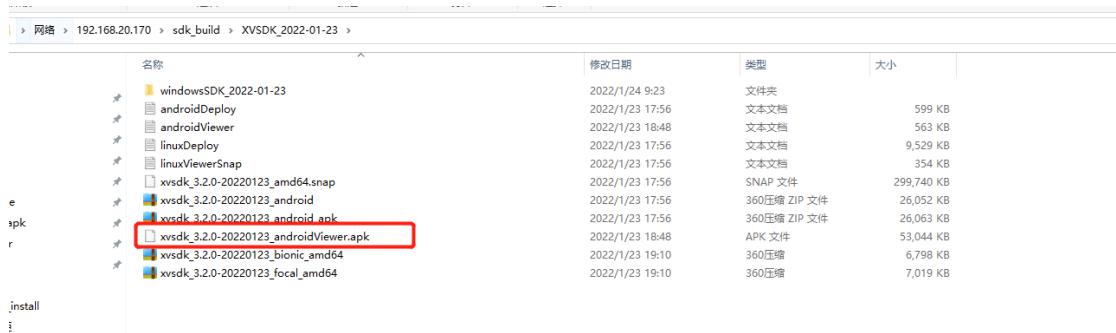


Figure 4-1 Get Android APK

2) Install to mobile android device:

➤ **Method 1: use command to install**

Step1: After connecting mobile device with PC, check the popup of mobile device:



Figure 4-2 Click "yes"

Step2: Use command "adb devices" to check whether the connection is good;

The red frame as below indicates a good connection between PC with mobile device.


```
C:\Users\DELL\Desktop\adb>adb devices
List of devices attached
* daemon not running; starting now at tcp:5037
* daemon started successfully
320595792127    device
```

Figure 4-3 connected well

The green frame as below indicates the mobile device is unauthorized. User should back to step1 to confirm whether USB debugging permission is authorized.

```
F:\ADB 1.0.31>adb devices
List of devices attached
0123456789ABCDEF    unauthorized
```

Figure 4-4 Unauthorized

Step3:

After connecting , input “adb install "C:\Users\DELL\Desktop\xxxx.apk"” to install APK.

“C:\Users\DELL\Desktop\ “ is the path of demo apk.

Generally, user can find the APK and drag it into the command box directly. The path address will be generated automatically. Press “enter” button to install it. The word "success" as shown in the figure below indicates that the installation has been successful.

```
C:\Users\DELL\Desktop\adb>adb install "C:\Users\DELL\Desktop\CES Demo\手势演示Demo\Gesture_YX.apk"
Success
```

Figure 4-5 Installation Successfully

➤ Method2: use installation package to install

Copy the APK installation package to the folder “sdcard” of mobile device. Find the APK in device manager and click it to install.

Note: after installing APK for the first time, user must give all permissions to APK. Run the demo APK without connecting glass, and click "yes" or "allow" according to the pop-up prompts to give APK permissions.

5. Run XVSDK-Viewer

1) Open a new terminal after connecting glass with PC, input “xv sdk-viewer” to run:

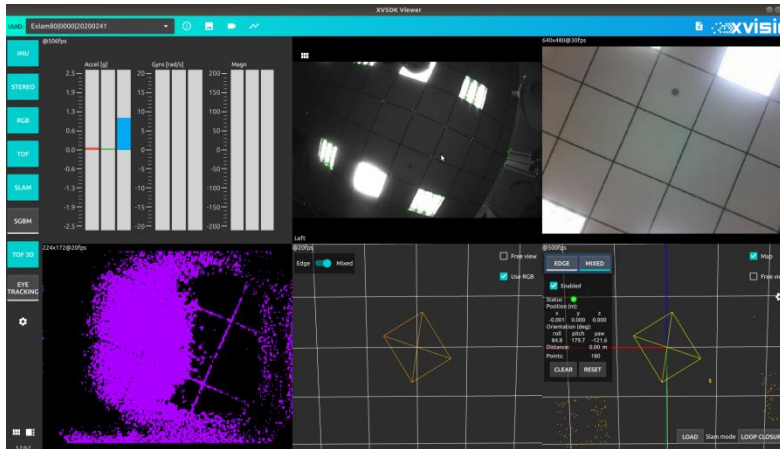


Figure 5-1 Run xvsdk-viewer

2) The SN number of glass is shown behind UUID, which can be used to confirm whether the glass has registered gestures. The glass without registered gestures has no SN number. Click “info” in the red box to view the version information:

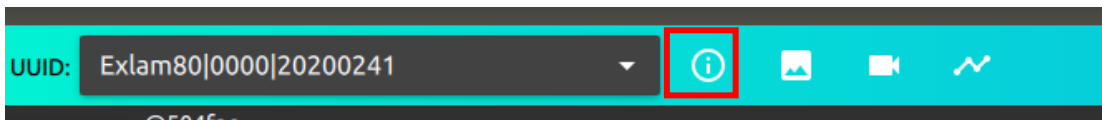


Figure 5-2 Check SN

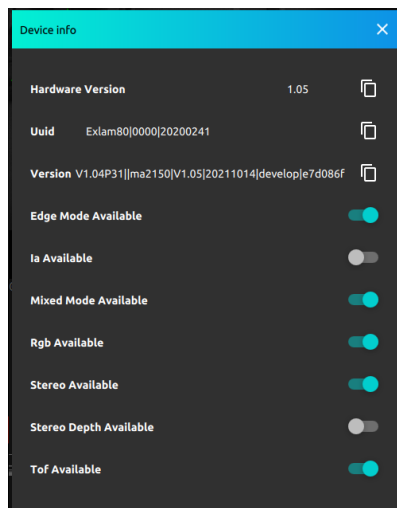


Figure 5-3 Revision Information

3) Check the data of Accel,Gyro and Magn as below:

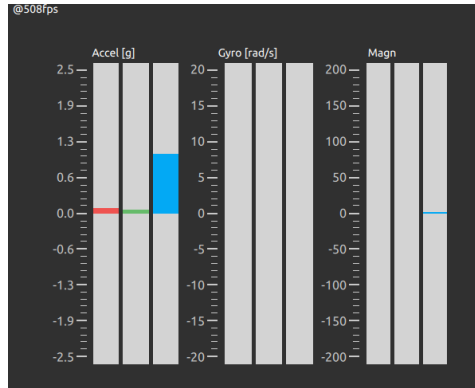


Figure 5-4 Accel,Gyro,Magn

Accel: When the glass is horizontally forward, the y-axis data is downward; When the glass is vertically forward, the x-axis data is downward; When the glass is horizontally downward, the z-axis data is downward.

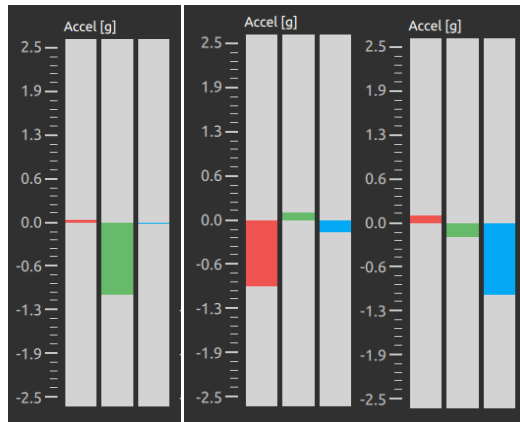


Figure 5-5 Accel

Gyro: Data jumps when shake glass, no data jumps when keep glass static.

Magn: Geomagnetic data

4) Fisheye (default of left fisheye) image is shown as below:

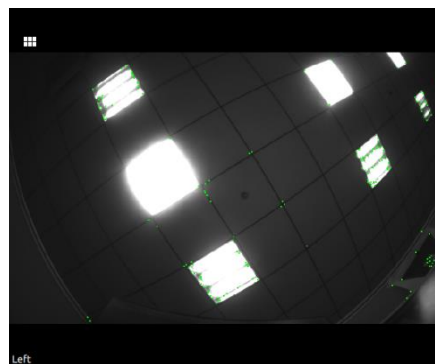


Figure 5-6 Left Fisheye

5) Click the icon on the top left to display fisheye images on both sides at the same time. Click the image on the left or right to enlarge the image.

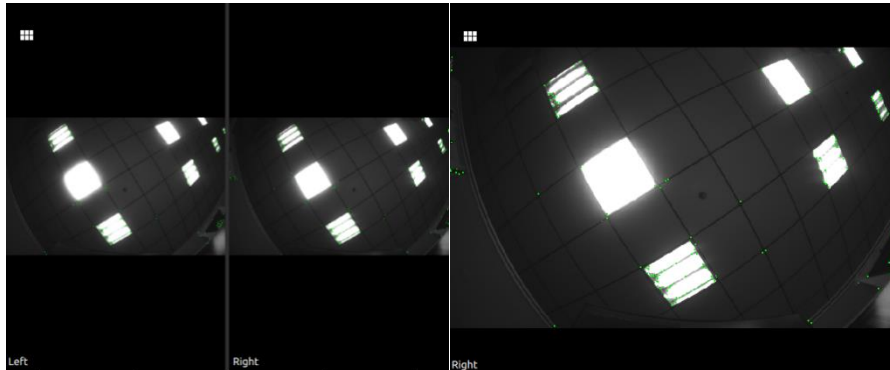


Figure 5-7 Enlarge Fisheye

6) When clicking the image, the setting button will appear on the right. Click the two buttons in the below red box to flip the image left/right or up/down; The button in the red box can be used to hide or display feature points; The button below the red box can be used to turn off auto exposure and make manual adjustment.

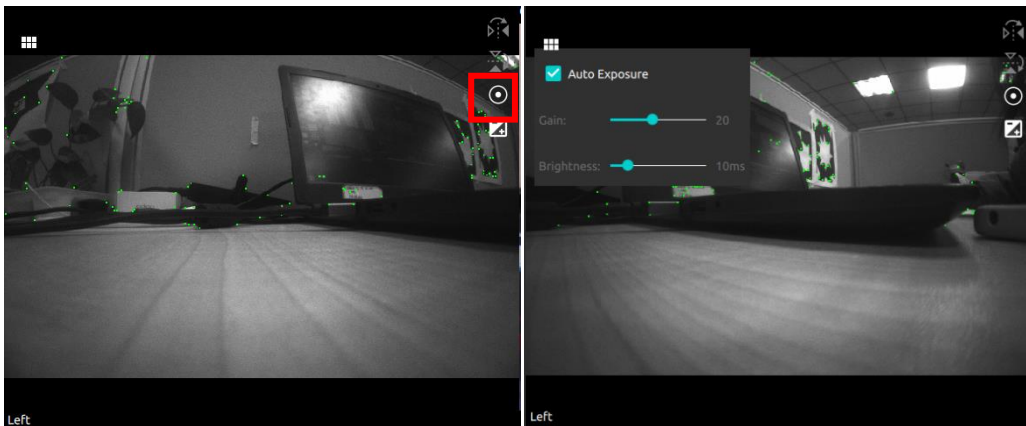


Figure 5-8 Flip the image

7) RGB image is shown as below. The upper left corner shows the resolution and frame rate of RGB image. When clicking the image, the setting button will appear on the right. User can adjust the RGB resolution and frame rate through setting

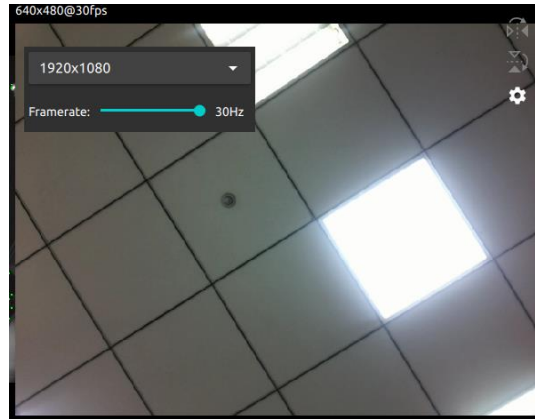


Figure 5-9 RGB Image

8) TOF image is shown as below. The upper left corner shows the resolution and frame rate of TOF image. When clicking the image, the setting button will appear on the right. User can adjust the maximum recognition distance and frame rate of TOF through setting.

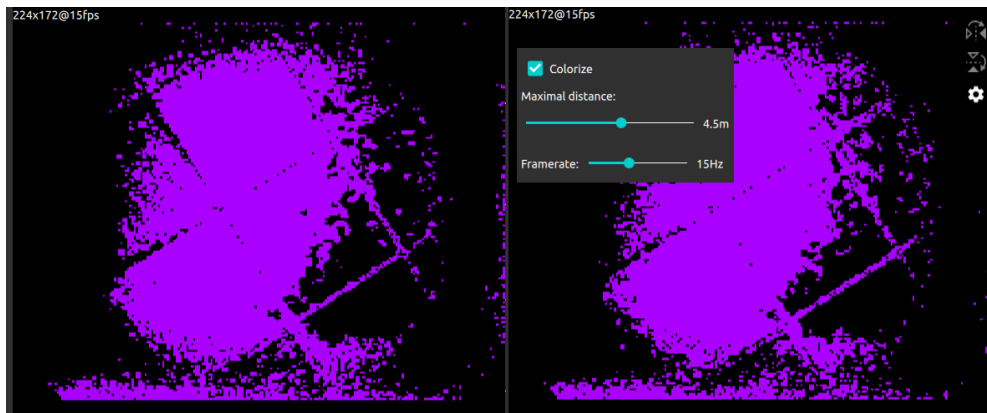


Figure 5-10 TOF Image

9) SGBM image is shown as below. User can adjust the parameters of image size, baseline, FOV, Confidence, Mode, Max distance, Min distance, etc...

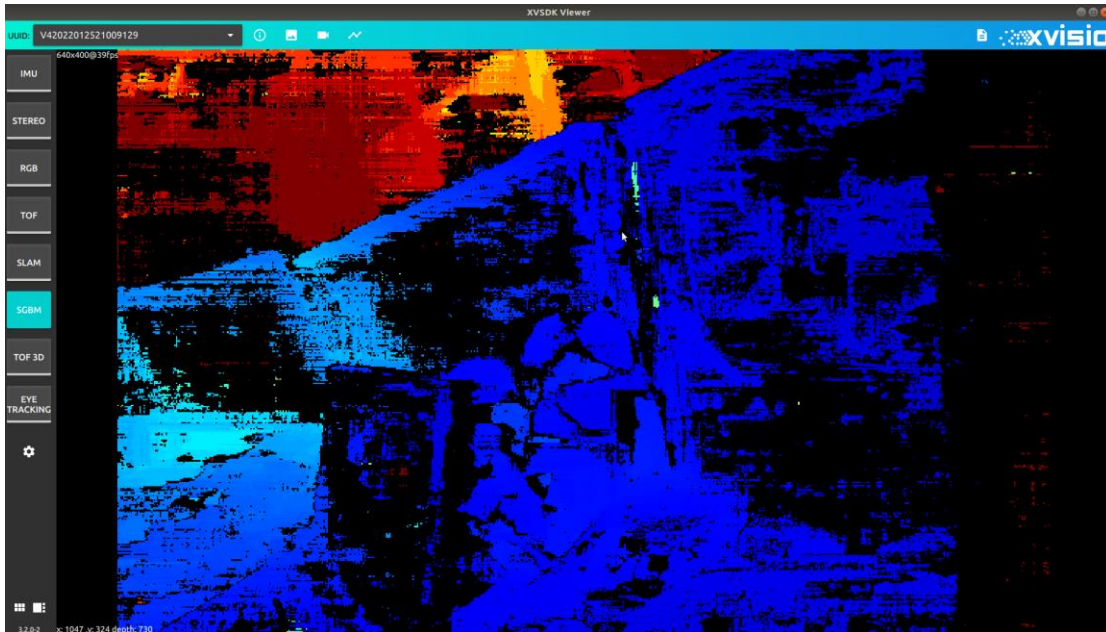


Figure 5-11 SGBM Image

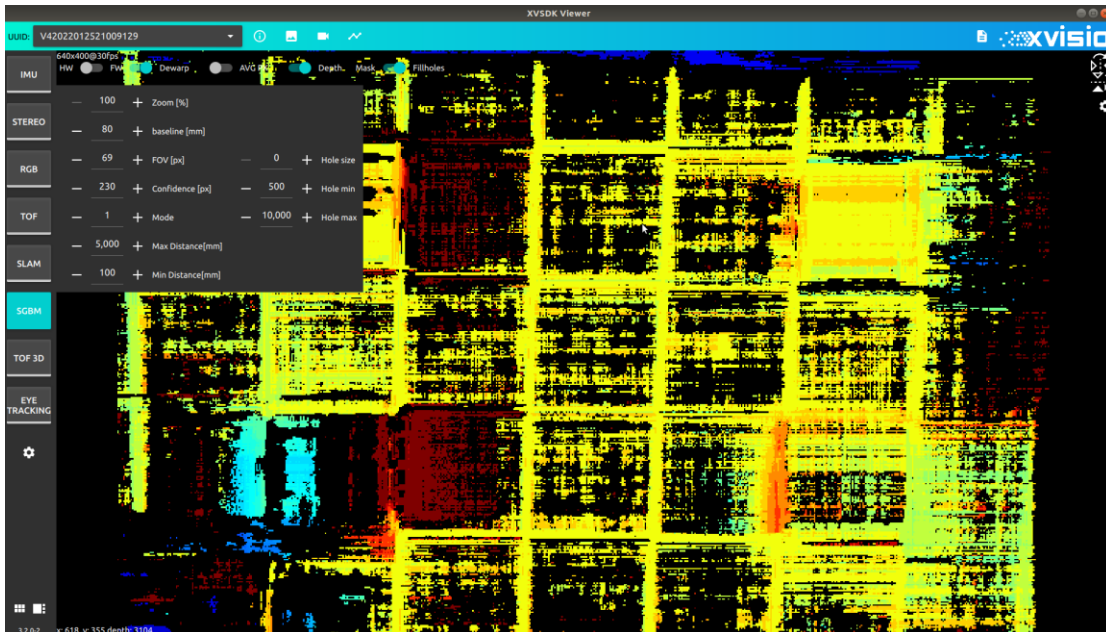


Figure 5-12 Set Parameters

10) RGBD is shown as below which include edge mode and mixed mode. The mode can be switched by options in the red box on the left. Uncheck the red box on the right to switch from RGB to TOF.

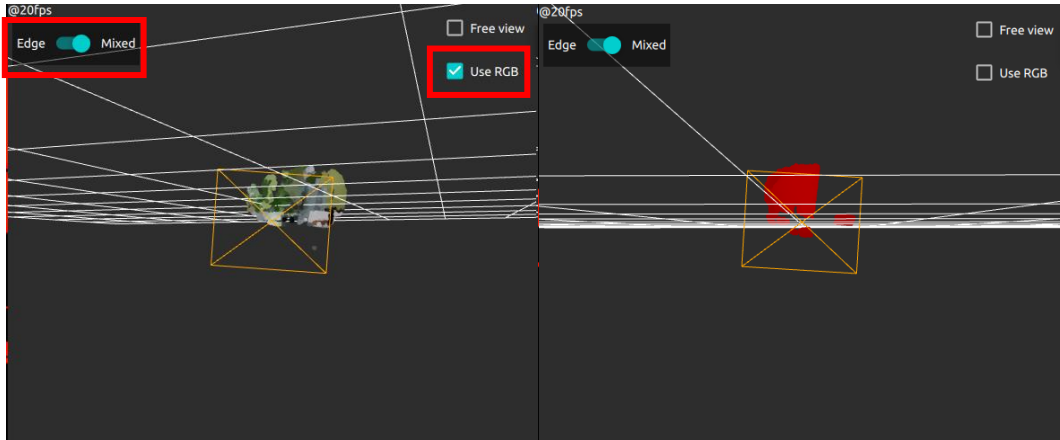


Figure 5-13 RGBD

11) SLAM includes edge mode and mixed mode. In mixed mode, user can adjust to "CSlam mode" through the button "LOOP CLOSURE" in the red box below. "LOAD" button is used to read map.

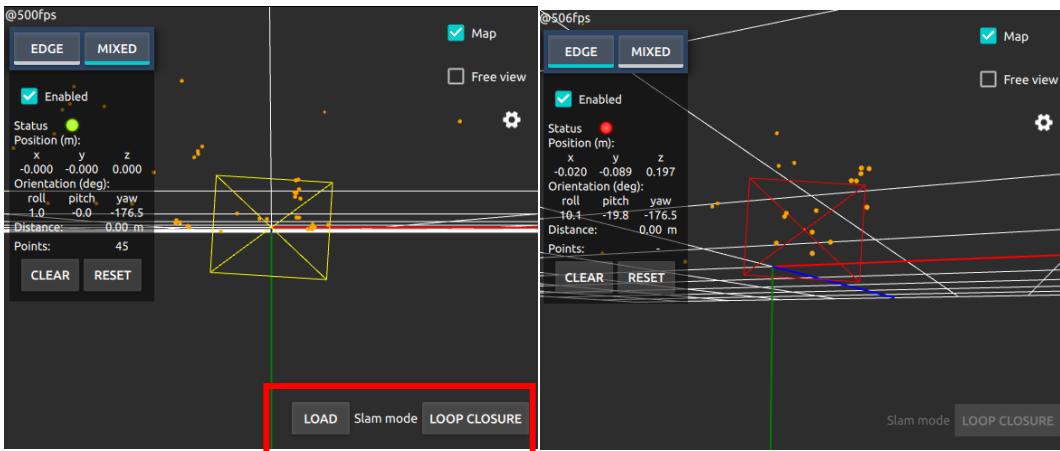


Figure 5-14 SLAM

Moving the module, the moving trajectory of the module can be seen in this area. Button "CLEAR" in the left box is used to clear the trajectory. Button "RESET" is used to clear the trajectory and return the image to the origin.

12) Click the option on the left to hide and open some interfaces.

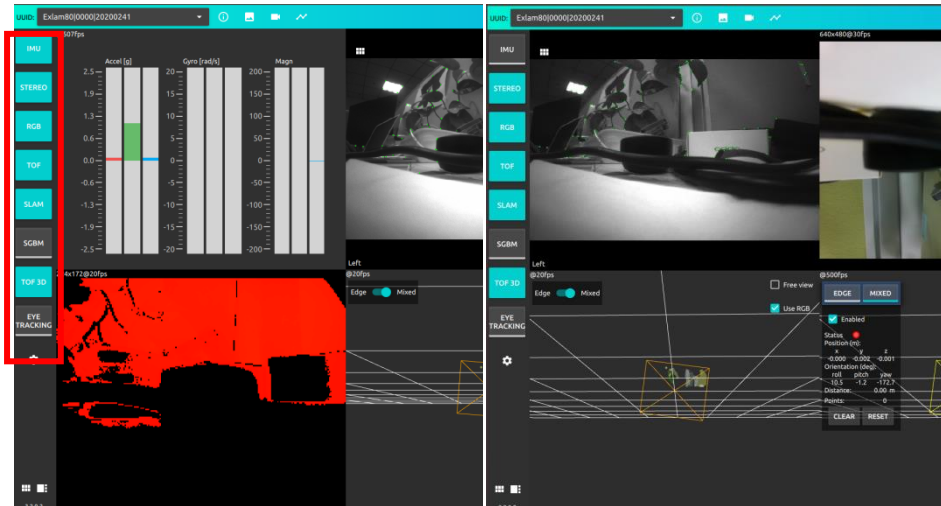


Figure 5-15 Options

6. Set up ROS Environment

User need to prepare Ubuntu SDK package before setting up ROS environment.

6.1 Process

6.1.1 Prepare Basic Documents

```
sudo apt-get install udev //install udev
```

```
cp ~/99-xvisio.rules ~/etc/udev/rules.d/ //skip this step if already exit. Refer to section 6.3 if copy failed
```

```
sudo udevadm control --reload-rules && udevadm trigger //recognized USB port.
```

6.1.2 Some Libs

- `sudo apt update`
- `sudo apt install -y lsb-release gnupg git g++ cmake cmake-curses-gui git pkg-config autoconf`
- `sudo apt install -y libtool libudev-dev libjpeg-dev zlib1g-dev libopencv-dev rapidjson-dev`
- `sudo apt install -y libeigen3-dev libboost-thread-dev libboost-filesystem-dev libboost-system-dev`
- `sudo apt install -y libboost-program-options-dev libboost-date-time-dev`

6.1.3 Install ROS Package

NOTE: It is needed to replace melodic to noetic in OS ubuntu 20.04.

```
sudo rm /etc/apt/sources.list.d/ros-latest.list //If it is prompted that there is no file to delete, skip and continue to the next step.
```

```
sudo sh -c 'echo "deb http://packages.ros.org/ros/ubuntu $(lsb_release -sc) main" > /etc/apt/sources.list.d/ros-latest.list'
```

```
sudo apt-key adv --keyserver 'hkp://keyserver.ubuntu.com:80' --recv-key C1CF6E31E6BADE8868B172B4F42ED6FBAB17C654
```

```
sudo apt update
```

```
sudo apt install -y ros-melodic-desktop-full ros-melodic-ddynamic-reconfigure
```

```
sudo apt install -y python-rosdep python-rosinstall python-rosinstall-generator python-wstool build-essential
```

```
sudo rosdep init //refer to section 6.3 for Q&A.
```

```
rosdep update
```

```
source /opt/ros/melodic/setup.bash
```

```
echo "source /opt/ros/melodic/setup.bash" >> ~/.bashrc
```

6.1.4 Init Catkin Workspace

```
mkdir -p ~/catkin_ws/src
```

```
cd ~/catkin_ws/
```

```
catkin_make //Initialize in the ROS workspace environment and create several folders  
source ${HOME}/catkin_ws/devel/setup.bash
```

```
echo "source ${HOME}/catkin_ws/devel/setup.bash" >> ~/.bashrc
```

6.1.5 Build xv_sdk

Install sdk3.2.0 according to Ubuntu version. “xv_sdk_3.2.0-20220321_bionic_amd64.deb” is used for Ubuntu 20.04.

```
xv_sdk_3.2.0-20220321_bionic_amd64.deb //double click “xv_sdk_3.2.0-20220321_bionic_amd64.deb” or use command to install. Refer to section 6.3 for Q&A.  
cd ~/catkin_ws/
```

```
cp -r xv_sdk ~/catkin_ws/src/ //copy folder “xv_sdk” into folder “src”
```

Go to “include” in folder “xv_sdk”, set line 38 in file “xv_sdk.hpp” as below://#define
NOT_USE_RGB

```
#define NOT_USE_TOF
```

```
//#define NOT_USE_SGBM
```

```
#define NOT_USE_FE
```

```
//#define USE_MAPPING_ON_HOST
```

```
#ifndef NOT_USE_TOF
```

```
// #define TOF_QVGA
```

```
#endif/*#ifndef NOT_USE_TOF*/
```

rosdep install --from-paths src --ignore-src -r -y //Install the dependency of ROS
package in workspace.

```
catkin_make -DXVSDK_INCLUDE_DIRS="/usr/include/xv_sdk" -  
DXVSDK_LIBRARIES="/usr/lib/libxv_sdk.so" //refer to section 6.3 for Q&A.
```

6.2 Run Demo

Note: use the below commands to run demo. Open three terminals to start them respectively.

1) node launch

```
roscore //used for starting ros master node  
manager
```

2) Roslaunch (reopen a new terminal)

```
cd ~/catkin_ws/  
roslaunch xv_sdk xv_sdk.launch //start all ros associated nodes
```

3) run demo (reopen a new terminal)

```
roslaunch rviz rviz -d `rospack find xv_sdk`/rviz/demo.rviz //run demo  
//click “Image Topi” in “Color Image” to preview rgb/tof/fisheye/rgbd.
```

6.3 Q&A

Q1: error may appears when run roscore:

1) IOError:[Errno 13] Permission denied: 'home/[user]/.ros/roscore-11311.pid'

This problem is caused by the permission of ROS file under this path.

```
cmd: sudo chmod 777 -R ~/.ros/
```

Restart ROS: roscore

2) If it cannot be started normally, it can be executed as below:

```
sudo apt-get install ros-melodic-desktop
```

```
source ~/.bashrc
```

Restart roscore

Q2: error may appear when execut “catkin_make”:

1) Find “No xv_sdk provided” through “CMakeList.txt”. “include” and “lib” haven’t been recognized.

The error mainly caused by copy “xv_sdk” to “catkin_ws/src” first and then excute “catkin_make”.

Answer: delete “xv_sdk” and then excute “catkin_make”. Then copy “xv_sdk”.

2) If it prompts the file does not exist, check whether the file has exceptions. Improper operation in file operation may result in file damage or loss.

Q3: Install “xv_sdk_3.2.0-20220321_bionic_amd64.deb” in Ubuntu18.04:

```
1) sudo apt-get update
```

```
2) sudo apt-get install -y g++ cmake libjpeg-dev zlib1g-dev udev libopencv-core3.2  
libopencv-highgui-dev liboctomap1.8 libboost-chrono-dev libboost-thread-dev  
libboost-filesystem-dev libboost-system-dev libboost-program-options-dev libboost-  
date-time-dev
```

```
3) sudo dpkg -i xv_sdk_3.2.0-20220321_bionic_amd64.deb
```

Q4: Error appers when install “sudo rosdep init: “The 'rosdep==0.21.0' distribution was not found and is required by the application”

Answer: change python3 to python2

```
sudo update-alternatives --config python
```

```
sudo update-alternatives --list python
```

```
sudo update-alternatives --install /usr/bin/python python /usr/bin/python2.7 1
```

```
sudo update-alternatives --list python
```

```
sudo update-alternatives --config python
```

 Follow the prompts and enter 1

```
python //default version is python2.7.17, continue the installation
```

```
sudo rosdep init
```

Q5: Failed when copy “99-xvisio.rules” to etc/udev/rules.d/.

Answer

1) `sudo gedit /etc/udev/rules.d/99-xvisio.rules` //open a text

2) Copy the below contents to text, save and exit:

```
SUBSYSTEM=="usb", ATTR{idVendor}=="040e", MODE="0666", GROUP="plugdev"
```

```
SUBSYSTEM=="usb", ATTR{idVendor}=="0e8d", MODE="0666", GROUP="plugdev"
```

```
SUBSYSTEM=="usb", ATTR{idVendor}=="05c6", MODE="0666", GROUP="plugdev"
```

```
SUBSYSTEM=="usb", ATTR{idVendor}=="18d1", MODE="0666", GROUP="plugdev"
```

```
SUBSYSTEM=="usb", ATTR{idVendor}=="22d9", MODE="0666", GROUP="plugdev"
```

```
SUBSYSTEM=="usb", ATTR{idVendor}=="19d2", MODE="0666", GROUP="plugdev"
```

3) `ls /etc/udev/rules.d/` check whether “99-xvisio.rules” exist

4) Check whether the content is written successfully

```
cd /etc/udev/rules.d
```

```
cat 99-xvisio.rules
```

Q6: Uninstall ROS:

```
sudo apt-get purge ros-*
```

6.4 Set up “python__wrapper” Environment

1) Double click “XVSDK-3.2.0-msvc2019-x64.exe to install xv sdk”, and then click “next step”:

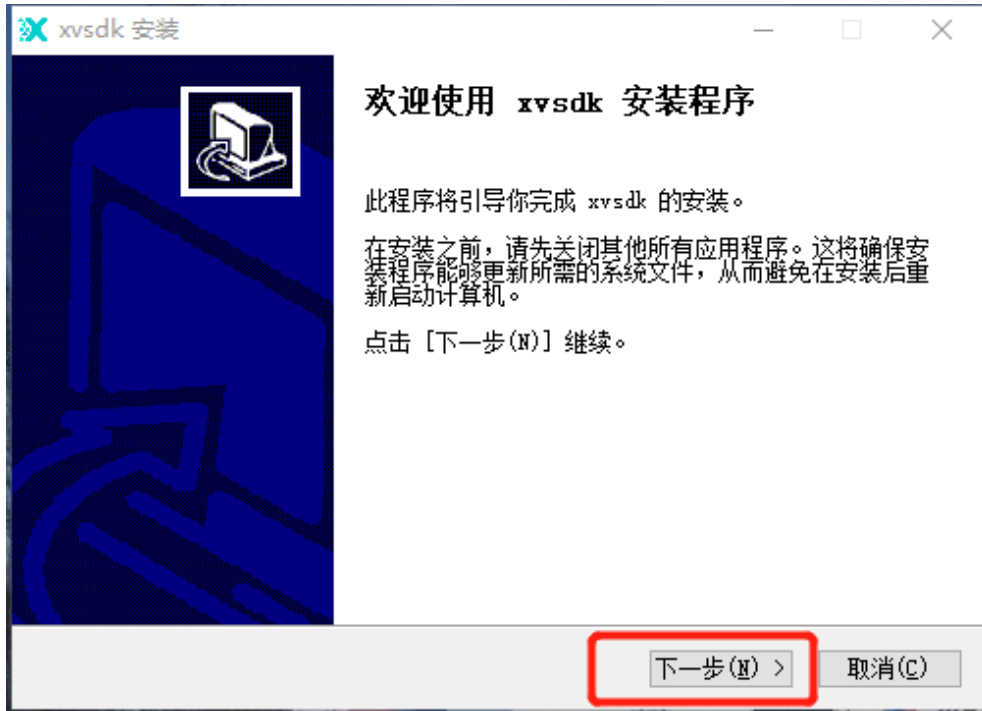


Figure 6-1 click “next setp”

2) Click “I accept” :



Figure 6-2 click “I accept”

3) Select installation path and cilck “next setp”:

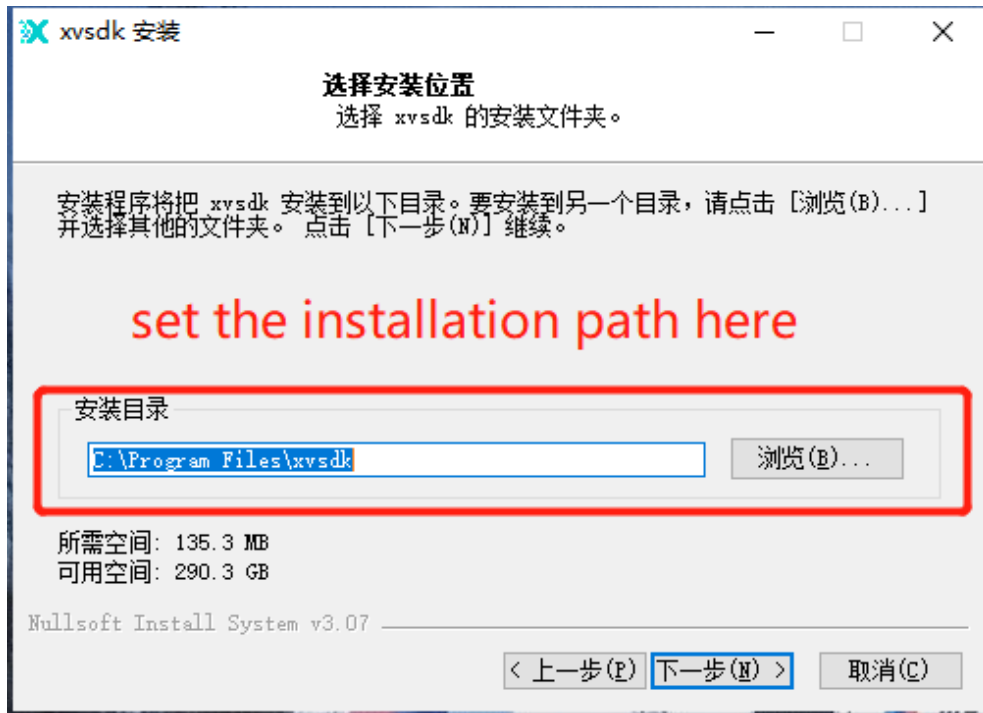


Figure 6-3 Select Installation Path

4) Click “next step”

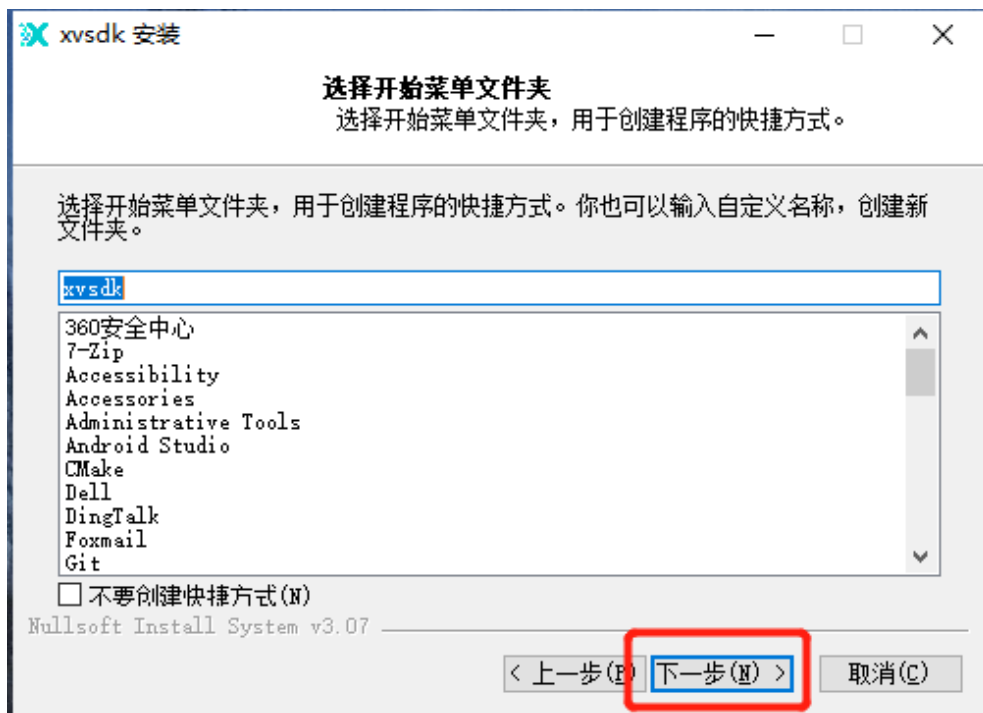


Figure 6-4 Click “next step”

5) Select “python_wrapper” and then click “install”:

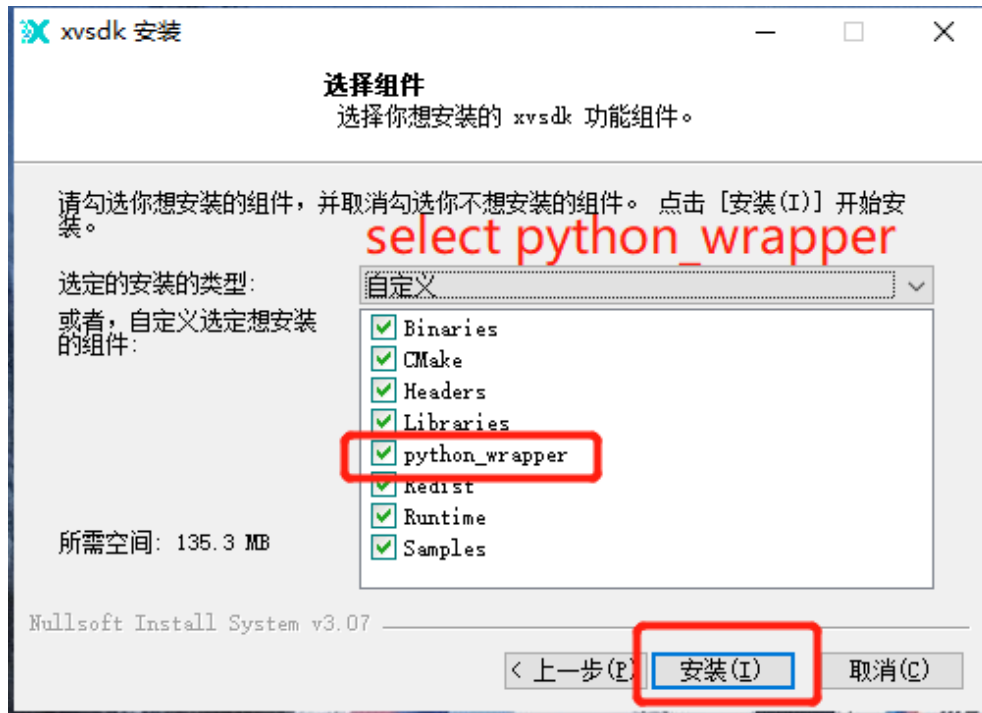


Figure 6-5 Cilck “install”

6) Folder “python-wrapper” can be found in cateloge \bin:

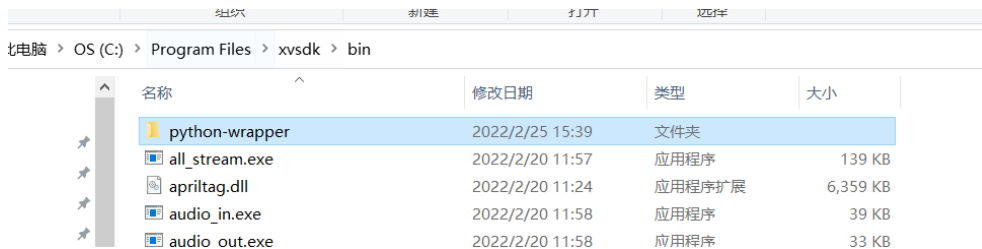


Figure 6-6 “python-wrapper”

7) Double click “python PythonDemo.py” in folder “python-wrapper”.

8) After installation, folder “python-wrapper” can be found in the installation path\bin.

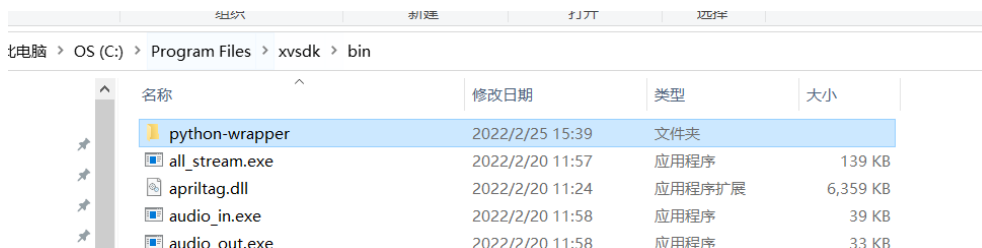


Figure 6-6 Folder “python-wrapper”

9) Enter into folder “ python-wrapper” to run: python PythonDemo.py

*Innovating machine perception capability
beyond human capacity*

