XVSDK-Viewer_User_Guide

Rev1.0

上海诠视传感技术有限公司

Xvisio Technology (Shanghai) Co., Ltd.

History Versions

Version	Descriptions	Author
1.0	Initial version	Xvisio

Contents

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 decscriptor is shown as below:

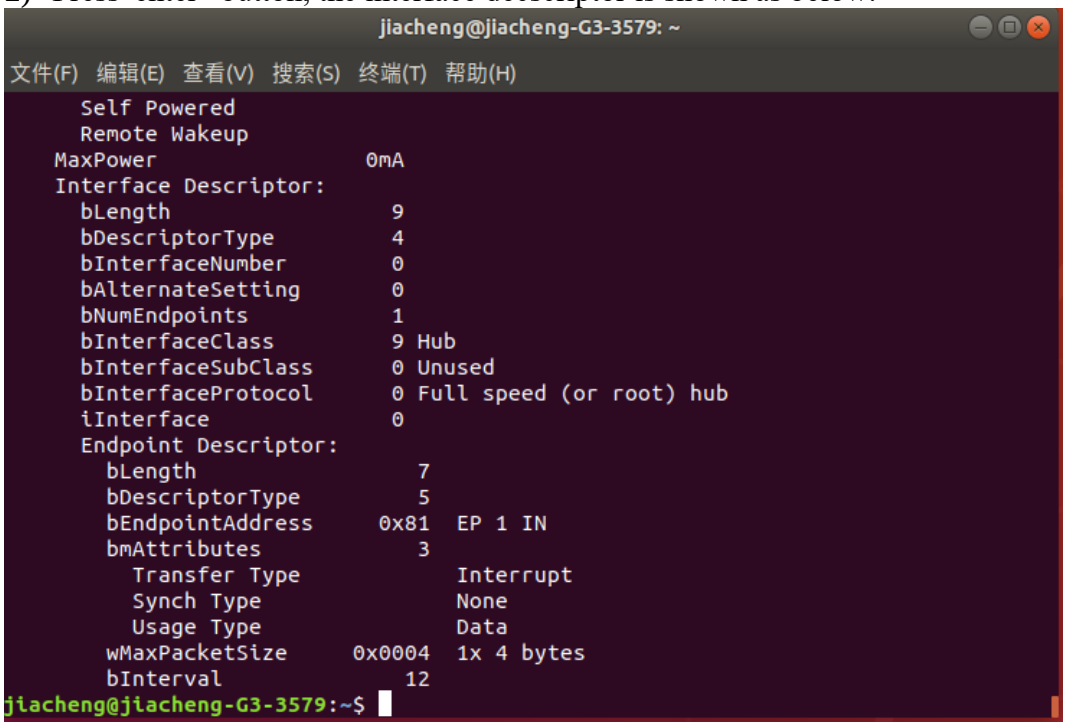

Figure 2-2 Interface Descriptor

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

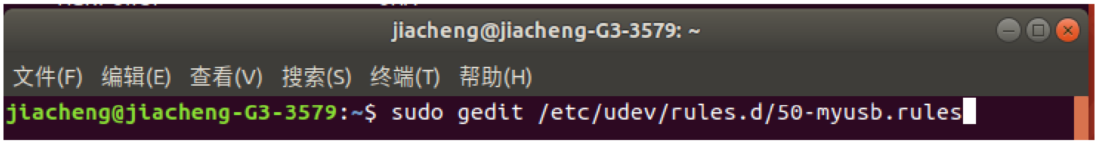

Figure2-3 Open a New Terminal

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.

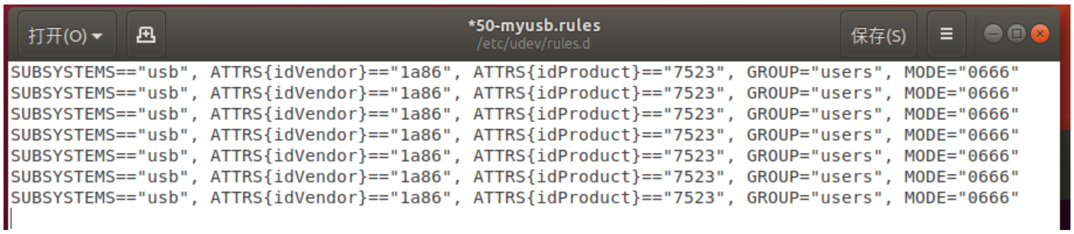

Figure 2-4 A Text Document

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 common 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 “idvendor” and “idproduct” that appear in two consecutive lines, otherwise no need to change.

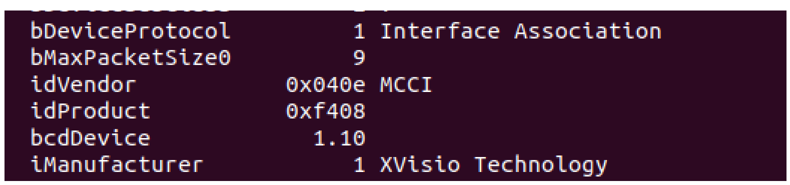

Figure 2-5 ” idvendor”&”idproduct”

6) After modification:

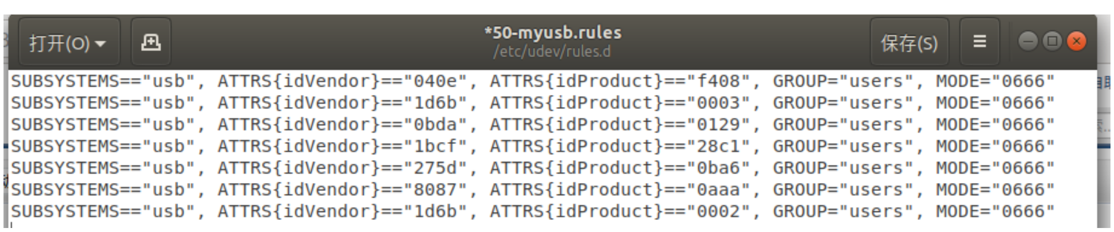

Figure 2-6 Modification Finished

7) Deletd 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.

Figure 2-7 Install Driver

2.2 Install Ubuntu SDK Tool

1） Get latest installation package:

Installation package 1：xvsdk_3.2.0-2022xxxx_amd64.snap

Installation package 2：

xvsdk_3.2.0-2022xxxx _bionic_amd64 （for Ubuntu 18.04）

xvsdk_3.2.0-2022xxxx _focal_amd64 （for Ubuntu 20.04）

2） Copy to system table file;

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

- Check all the snap package to find out xvsdk-viewer.

cmd：*sudo snap list*

- Delete xvsdk-viewer.

cmd：*sudo snap remove xvsdk-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 “xvsdk-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 vsc.

XVisio-Windows-drivers.pdf

Figure 3-1 Reference Document

vsc driver package:

zadig-2.5.7z

Figure 3-2 vsc Driver Package

3.1 Install Windows SDK

1） Get install package of xvsdk-viewer and SDK.

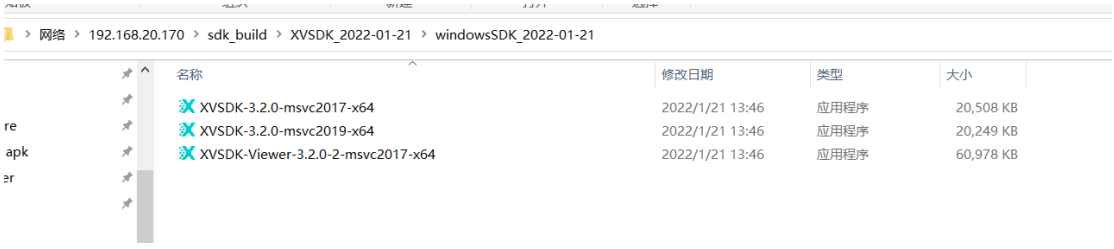

Figure 3-3 SDK Installation Package

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

3） Find out SDK installation catalogue (usually default to C:\Program Files\xvsdk\bin). Double click ”all_stream”which indicates all the camera have been started.

4. Android Platform

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

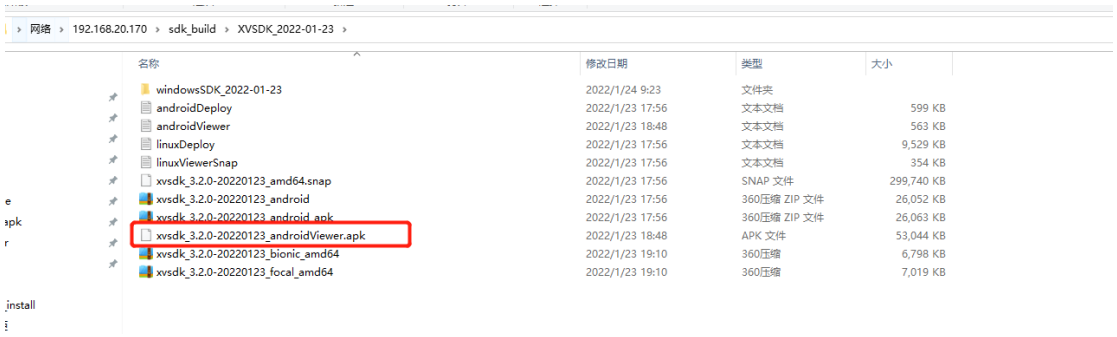

Figure 4-1 Get Android APK

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.

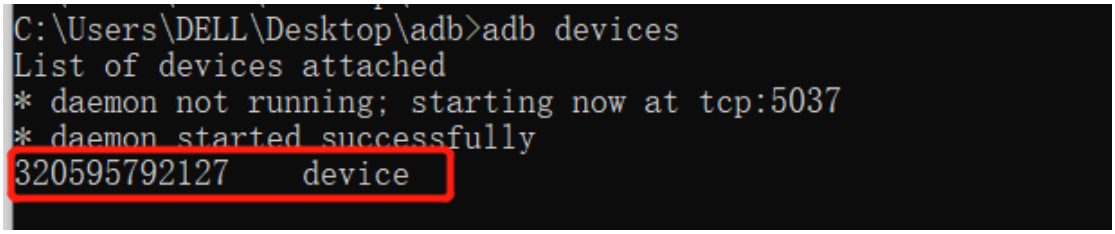

Figure 4-3 connected well

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

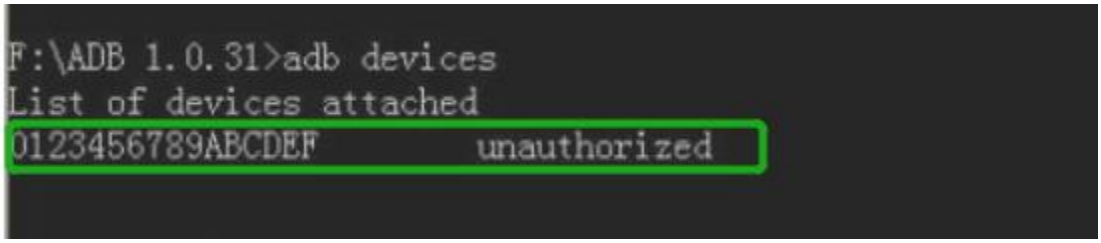

Figure 4-4 Unauthorized

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.

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 “xvsdk-viewer” to run:

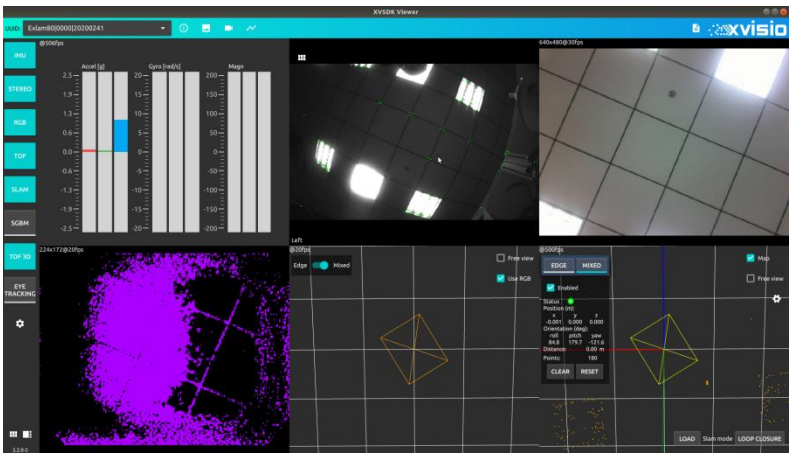

Figure 5-1 Run xvsdk-viewer

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:

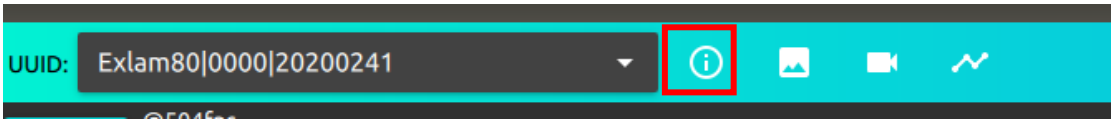

Figure 5-2 Check SN

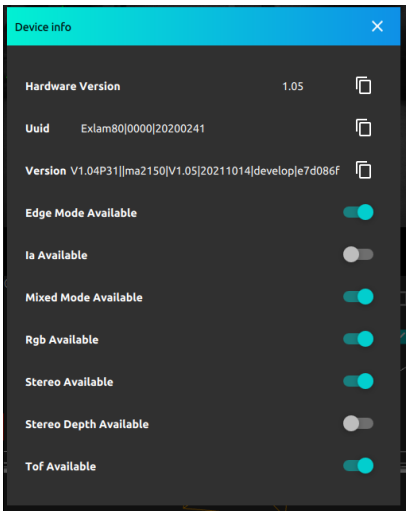

Figure 5-3 Revision Information

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

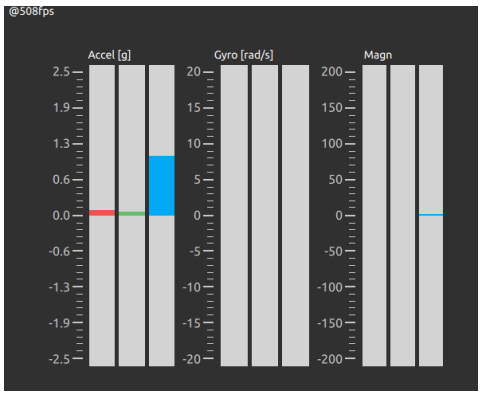

Figure 5-4 Accel,Gyro,Magn

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.

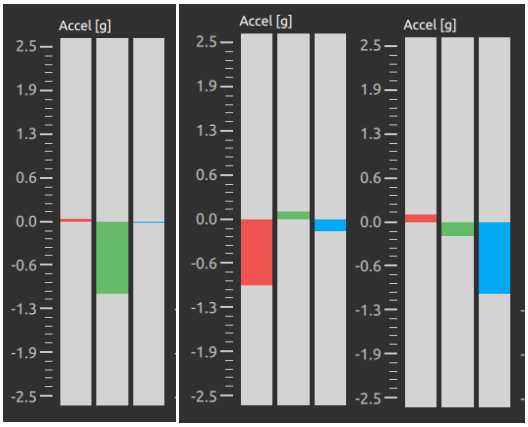

Figure 5-5 Accel

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:

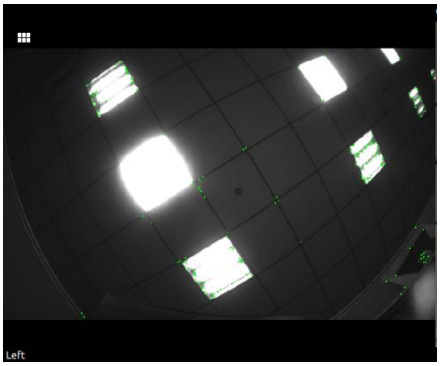

Figure 5-6 Left Fisheye

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.

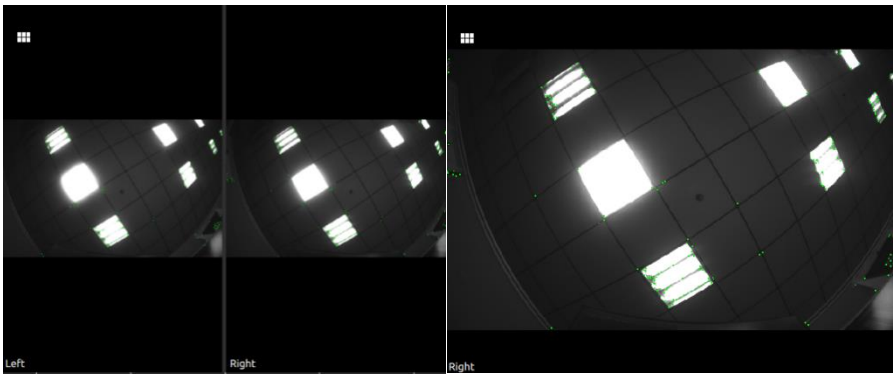

Figure 5-7 Enlarge Fisheye

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

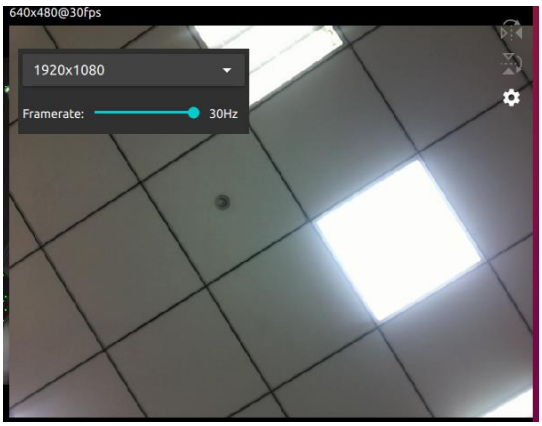

Figure 5-9 RGB Image

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.

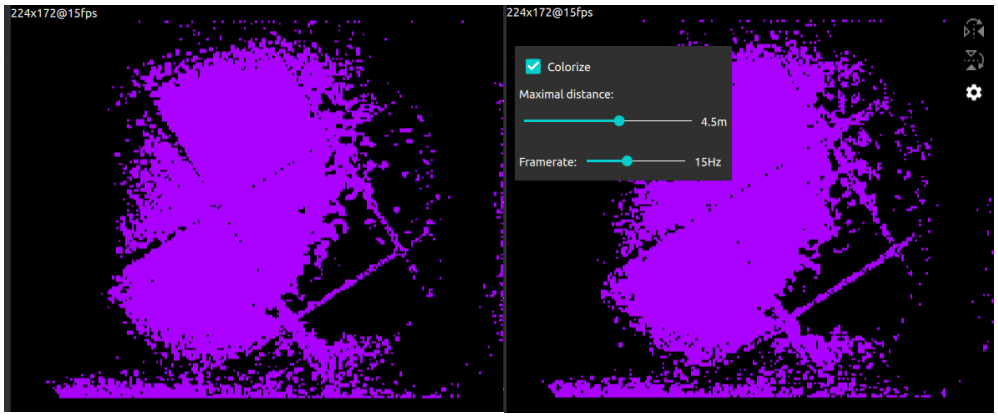

Figure 5-10 TOF Image

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

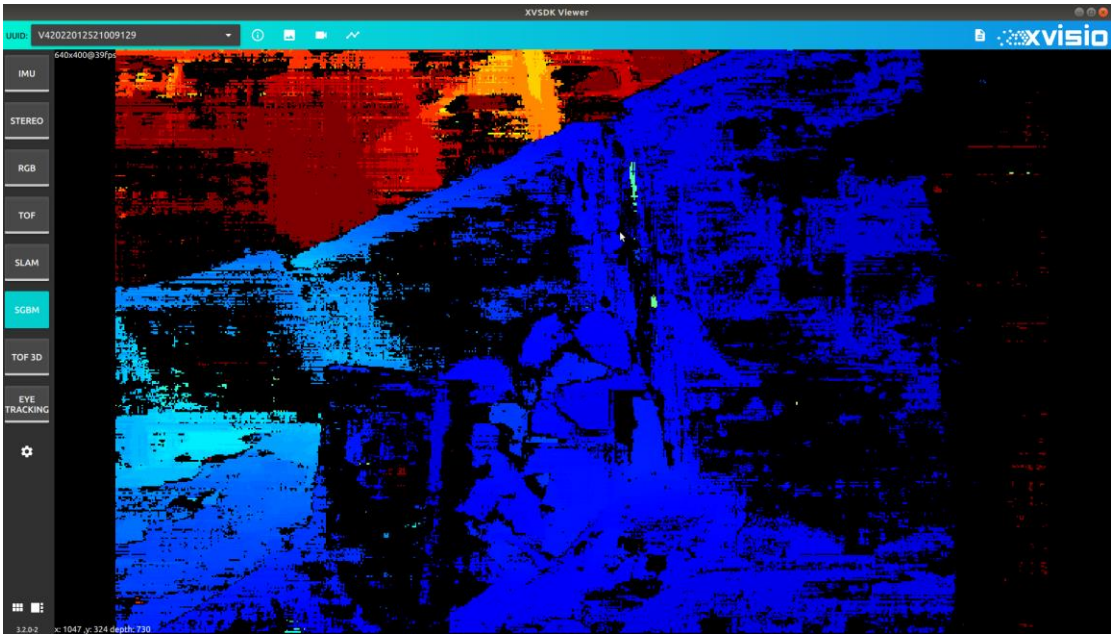

Figure 5-11 SGBM Image

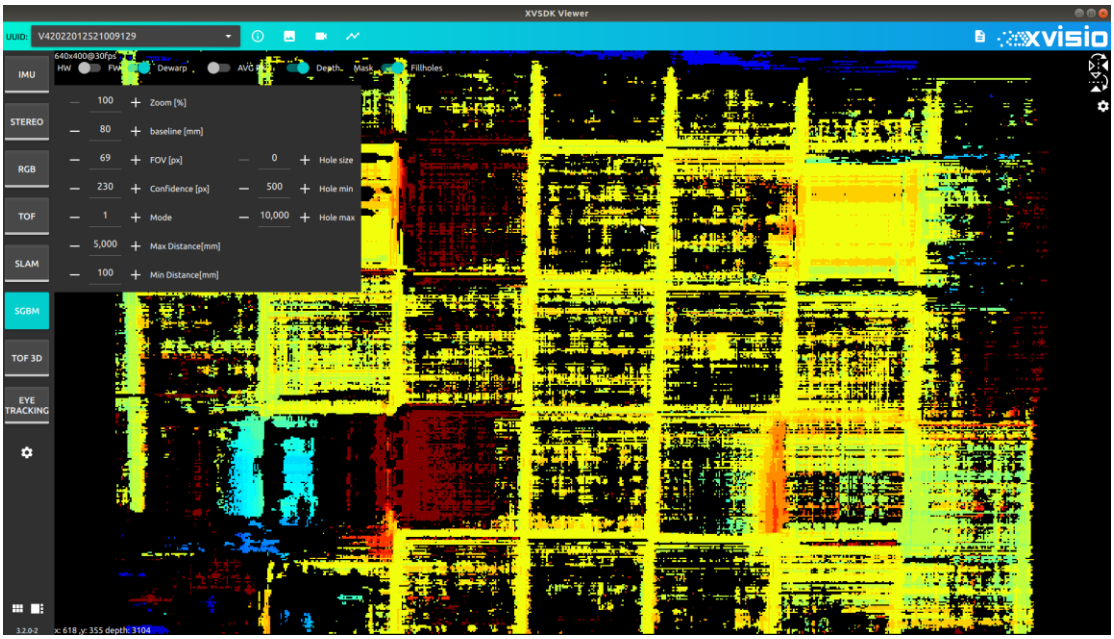

Figure 5-12 Set Parameters

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.

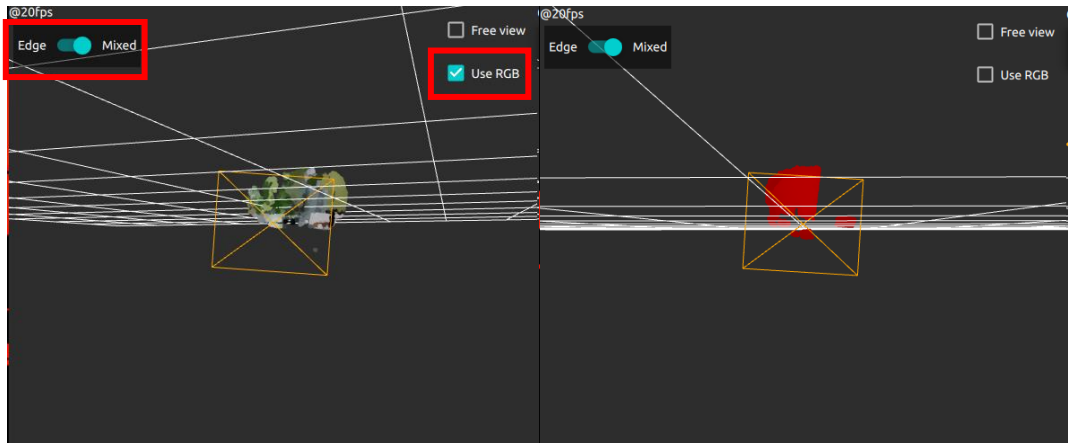

Figure 5-13 RGBD

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.

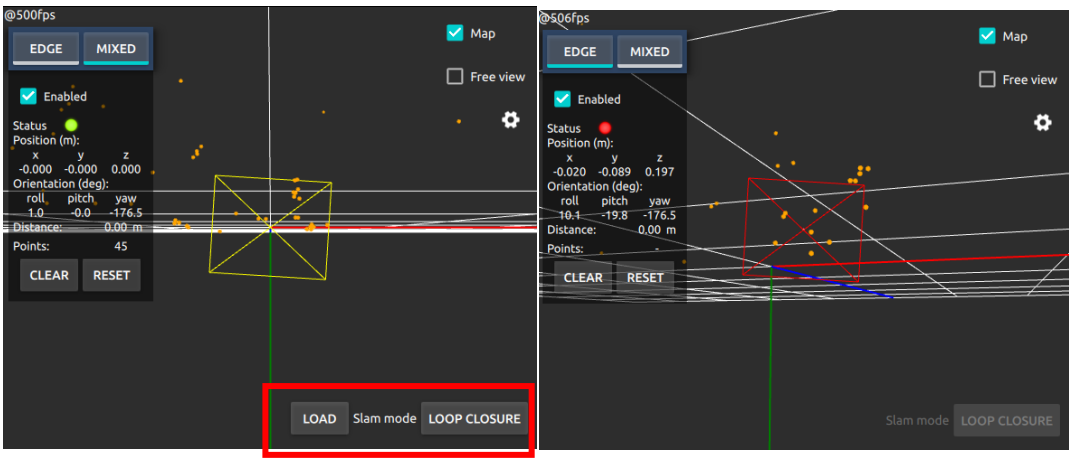

Figure 5-14 SLAM

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" Iis 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.

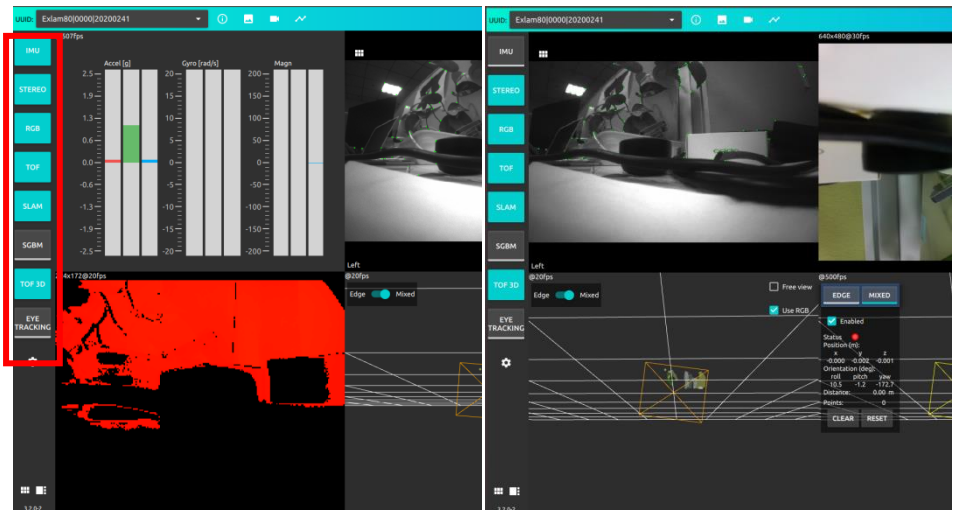

Figure 5-15 Options

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.“xvsdk_3.2.0-20220321_bionic_amd64.deb” is used for Ubuntu 20.04.

xvsdk_3.2.0-20220321_bionic_amd64.deb //double click “xvsdk_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 floder “xv_sdk” into floder “src”

Go to “include” in floder “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/xvsdk" -DXVSDK_LIBRARIES="/usr/lib/libxvsdk.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 staring 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)

rosrun 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 xvsdk provided" through "CMakeList.txt". "include" and "lib" haven't been recognized.

Yhe 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 "xvsdk_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 xvsdk_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 xvsdk", and then click "next stap":

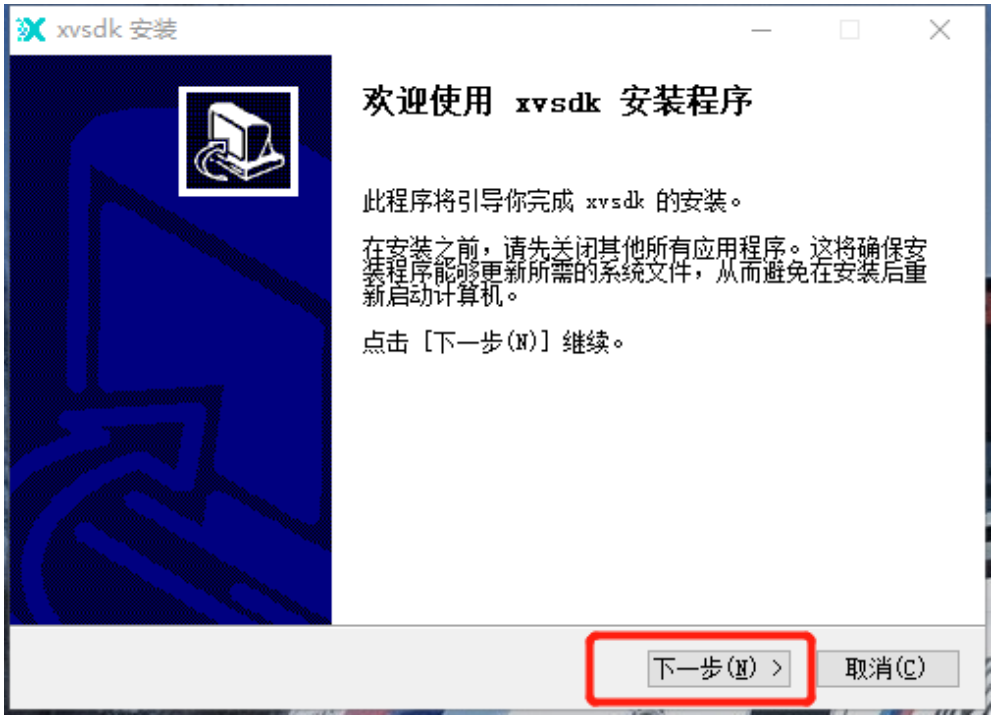

Figure 6-1 click “next setp”

2) Click “I accept”：

Figure 6-2 click “I accept”

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

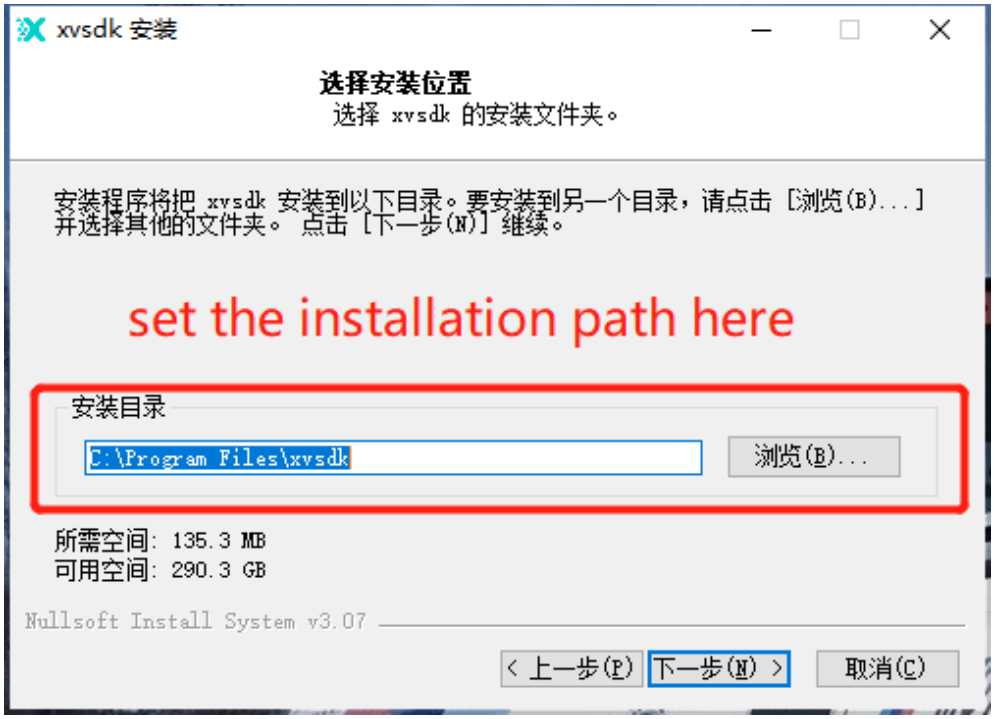

Figure 6-3 Select Installation Path

4) Click “next step”

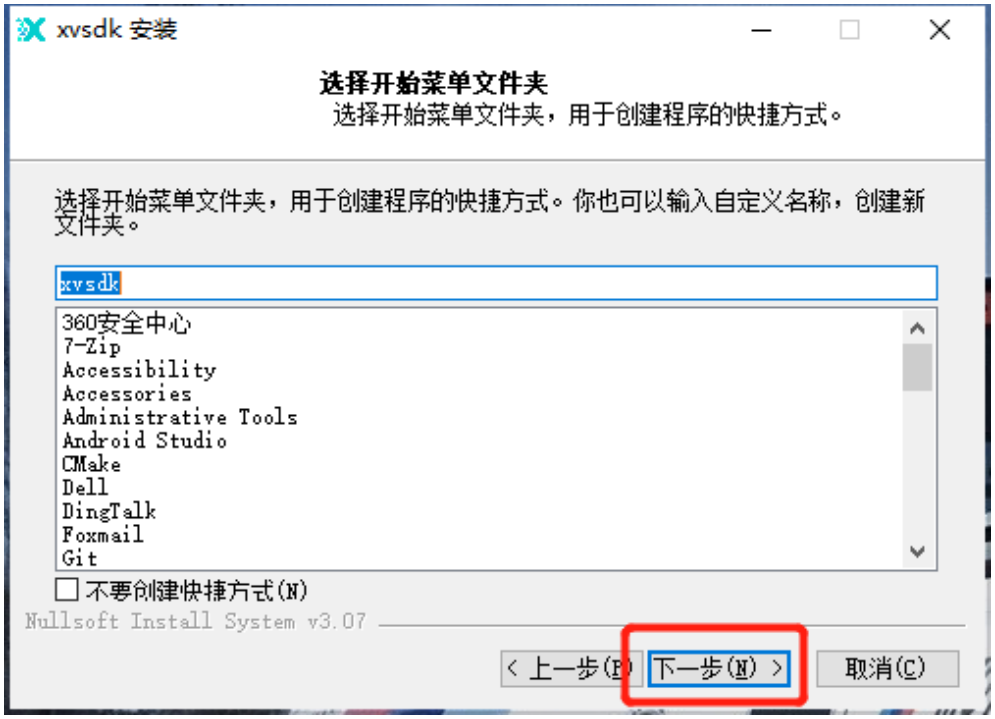

Figure 6-4 Click “next setp”

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

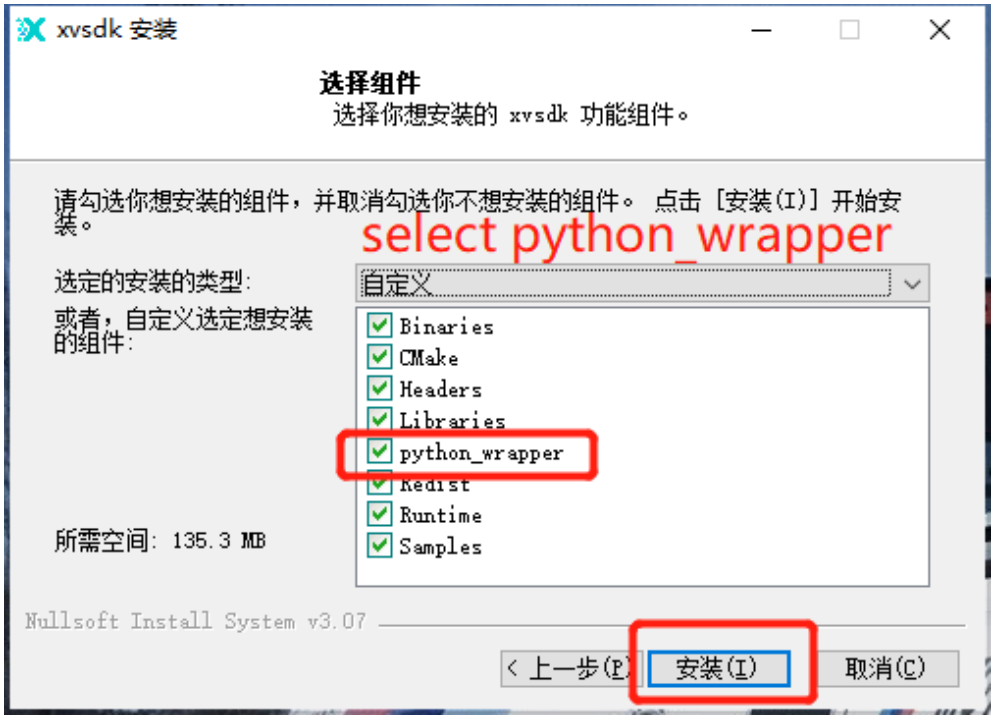

Figure 6-5 Cilck “install”

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

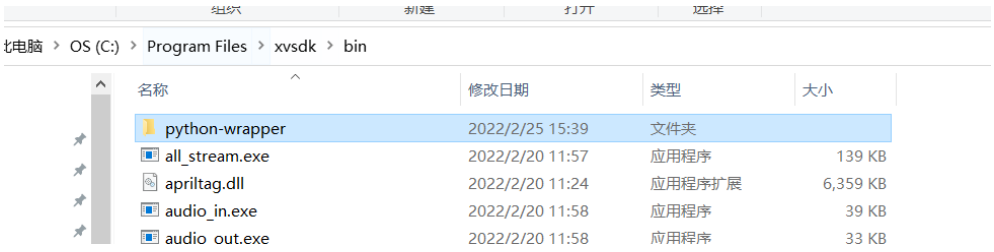

Figure 6-6 “python-wrapper”

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

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

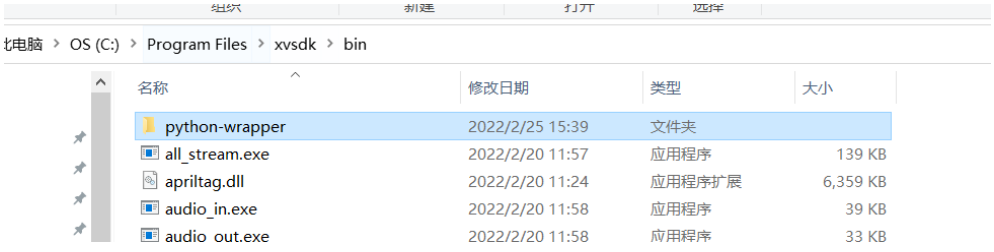

Figure 6-6 Folder “python-wrapper”

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