

# 一、 How to use NPU on Linux system

## 1. Write the firmware

The burning firmware is:

OrangePi\_4\_ubuntu\_bionic\_desktop\_linux4.4.179\_NPU\_v1.0.img

This firmware has installed opencv3.2

Burning method: Please refer to the user manual "Linux Firmware Burning Chapter"

## 2. Development board operation

Please insert the SD card with the firmware into OrangePi 4B, connect the mouse and keyboard, and then power on.

First refer to the user manual to expand the capacity to avoid problems caused by insufficient space.

Linux SDK has been placed in orangepi user home directory

```
cd /home/orangepi/GTISDK-Linux_aarch64_v4.5.1.0
```

### Directory structure description

```
GTISDK-Linux_aarch64_v4.5.1.0
├── Apps
│   ├── Data                Directory for storing video material files
│   ├── Demo                Demo test program for Linux platform
│   ├── liteDemo            liteDemo test program
│   ├── Models              Directory for storing neural network model files
│   ├── PipelineDemo
│   └── Python              Python test source
├── Bin
│   └── Linux
├── Build
│   ├── aarch64_cross.env    Environment profile
│   └── GTISDK.env
├── data
│   ├── Image_Lite
│   └── Models
├── Documents
│   ├── GTI2801-2803-5801_SDK_v4.5.1.0.pdf
│   └── GTI5801_Firmware_Release_Notes.pdf
└── End_User_License_Agreement.pdf
```

```

├── Firmware
│   └── 5801
├── Include
│   ├── GTILib.h           GTI related header files
│   └── GtiLog.h
├── Lib
│   └── Linux             GTI related libraries
├── Python
│   ├── Lib
│   ├── README_release.txt
│   └── Samples
├── README.txt
├── Samples
│   └── Sample
├── SourceMe.env         Environment profile
├── Terms_of_Service.pdf
├── Thirdparty
│   ├── download
│   ├── libusb
│   ├── libusb-aarch64
│   ├── libusb-android
│   └── libusb-armv7l
├── Third_Party_Terms_and_Open_Source_Terms.pdf
├── Tools
│   ├── eusbTool         Test tools provided by GTI
│   ├── hwTool
│   ├── imageTool
│   ├── modelTool
│   └── usbTool

```

36 directories, 12 files

### 3. Compile and run

#### 1) Switch to root user

```
$ su
```

#### 2) Make sure the NPU device node exists

```
$ ls /dev/sg*  
/dev/sg0
```

#### 3) SDK compilation environment detection and environment configuration

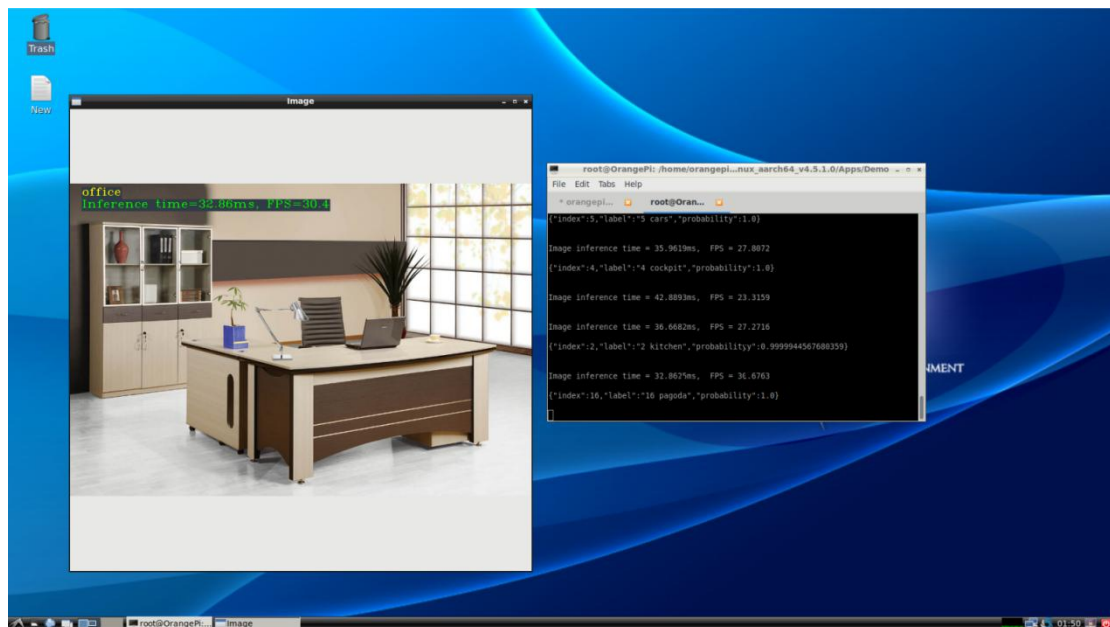
```
source SourceMe.env
```

#### 4) Compile Demo

```
cd Apps/Demo  
make
```

#### 5) Run Demo

```
rm /dev/mmcblk1          Delete mmcblk1 node  
./demo  
slideshow ../Models/2801/gti_gnet3_fc20_2801.model ../Data/Image_bmp_c  
20/
```



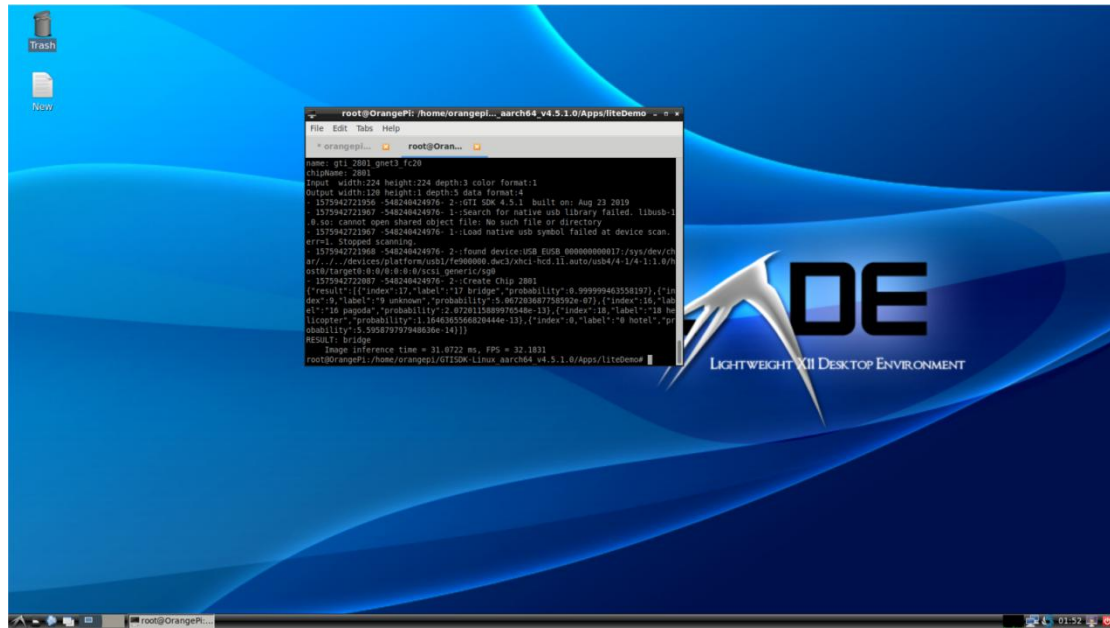
The upper left corner of the window will show the correct recognition result

## 6) Compile liteDemo

```
cd Apps/liteDemo  
make
```

## 7) Run liteDemo

```
./liteDemo ../Models/2801/gti_gnet3_fc20_2801.model ../Data/Image_lite/bridge_c20.bin
```



## 二、 How to use NPU on Android system

### 1. NPU device node settings

Connect to the Android shell using adb, then do the following to modify node permissions

```
chmod 777 /dev/sg*
```

### 2. Modify the max\_sectors property

Connect to the Android shell using adb and do the following

```
find /sys/devices/ -name max_sectors -exec sh -c 'echo 2048 > "$1"' _ {} \;
```

Set the max\_sectors value to 2048

### 3. Install the files and models required by the demo.

Extract the compressed package

```
tar -xvf gtiData.tar.gz
```

Use adb to push files to android

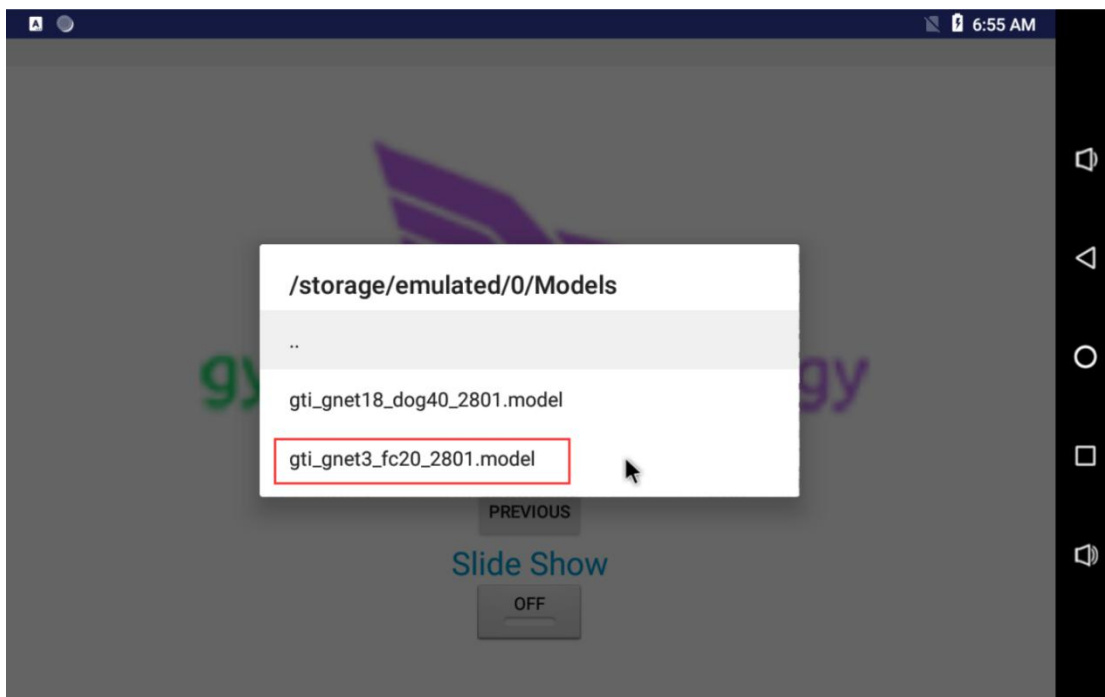
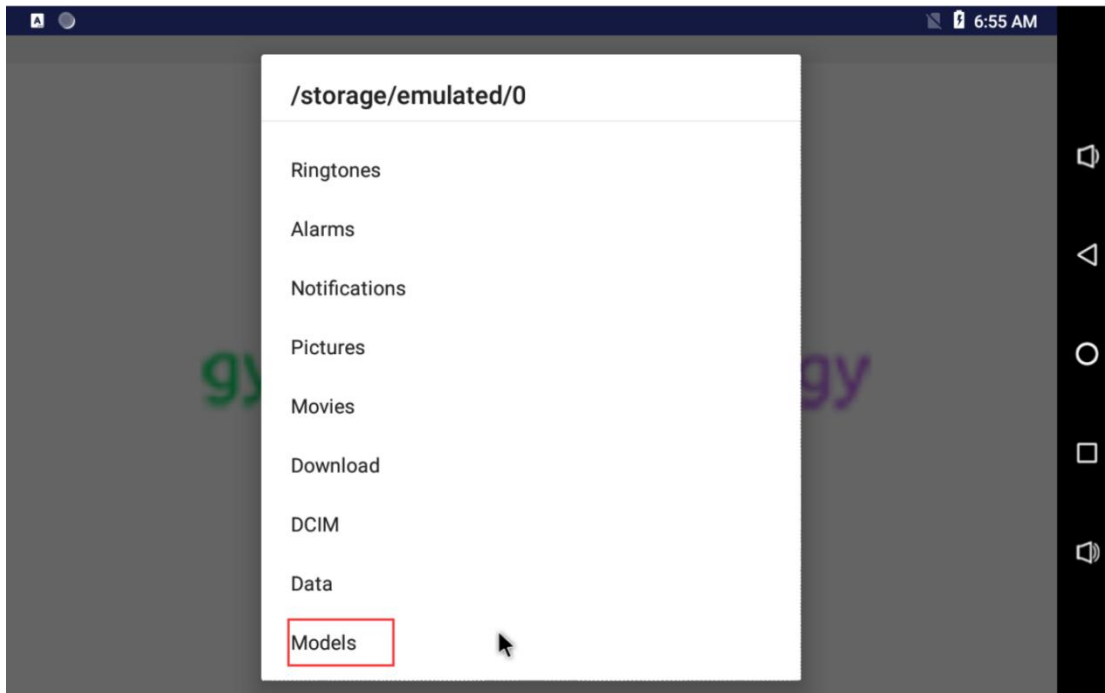
```
adb push gtiData /sdcard/
```

### 4. Compile and test demo

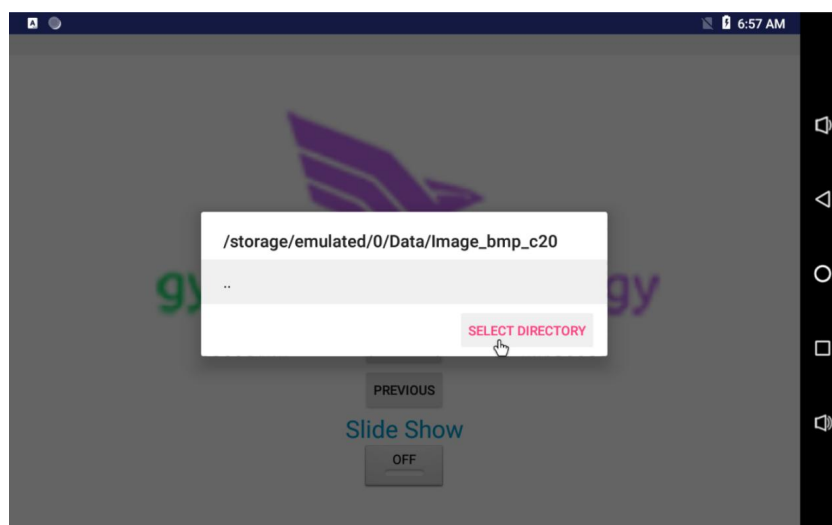
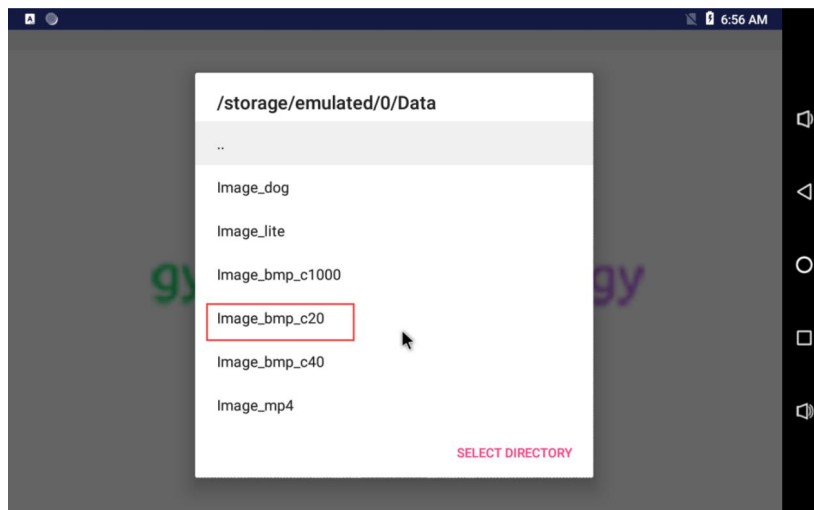
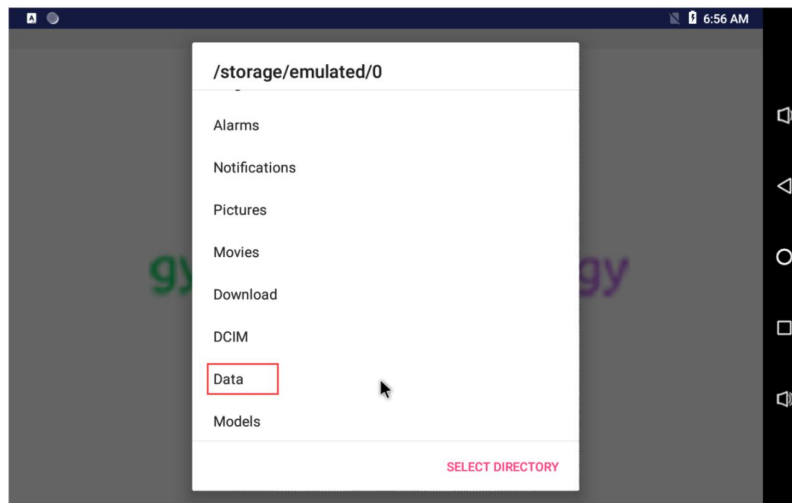
Use Android Studio to open the gti4Demo project on the computer.

After the dependencies are installed, click the Android Studio run button to run the demo.

# 1) Select the Model file



## 2) Select picture directory



### 3) Start running Demo

0.9575 - 14 toyshop  
0.0273 - 9 unknown  
0.0149 - 10 People



NEXT

PREVIOUS

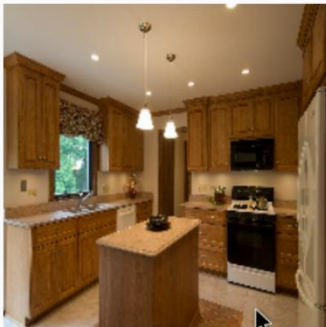
Slide Show

OFF

6:57 AM

This screenshot shows a mobile application interface. At the top, there is a blue header bar with a status bar on the right showing the time as 6:57 AM. Below the header, there is a list of three items: '0.9575 - 14 toyshop' in green, '0.0273 - 9 unknown' in red, and '0.0149 - 10 People' in red. The main content area features a large photograph of a toy store aisle. Below the photo are three buttons: 'NEXT', 'PREVIOUS', and 'Slide Show'. Underneath the 'Slide Show' button is a toggle switch labeled 'OFF' with a hand cursor pointing to it. On the right side of the screen, there is a vertical black bar containing standard Android navigation icons: a back arrow, a home circle, a recent apps square, and a power button.

0.9575 - 14 toyshop  
0.0273 - 9 unknown  
0.0149 - 10 People



NEXT

PREVIOUS

Slide Show

ON

6:58 AM

This screenshot shows the same mobile application interface as the first one, but with a different image. The main content area now features a photograph of a modern kitchen with wooden cabinets, a central island, and a window. Below the photo are three buttons: 'NEXT', 'PREVIOUS', and 'Slide Show'. Underneath the 'Slide Show' button is a toggle switch labeled 'ON' with a green bar indicating it is turned on. The status bar at the top right shows the time as 6:58 AM. The same vertical black bar with navigation icons is present on the right side of the screen.