Jetson Orin NX Hardware Library Configuration

Jetson.GPIO - Linux for Tegra

1.introduce

The Jetson TX1, TX2, AGX Xavier, Nano, and Orin series development boards include a 40 pin GPIO connector, similar to the 40 pin connector in Raspberry Pi. You can use the Python library provided in the Jetson GPIO Library package to control the digital inputs and outputs of these GPIOs. This library shares the same API as Raspberry Pi's RPi. GPIO library to provide a convenient way to move applications running on Raspberry Pi to the Jetson board.

In addition to this document, the Jetson GPIO library package also includes the following content:

1. This lib/Python/subdirectory contains Python modules that implement all library functions. The gpio.py module is the main component of gpio that imports applications and provides the required APIs_ Event.py and gpio_ pin_ The data.py module is used for importing directly into applications through the gpio.py module.
2. This samples/subdirectory contains sample applications to help you familiarize yourself with the library API and start using the application. These simple_ Input.py and simple_ The output.py application shows how to perform read and write operations on GPIO pins using buttons_ led.py， button_ Event.py and button_ Interrupt. py shows how to use buttons to use busy waiting, blocking waiting, and interrupt callback to make the LED blink.

This document will introduce the content contained in the Jetson GPIO library package, how to configure the system, and run the provided sample applications and library APIs. Here we briefly introduce how to use this library for Jetson.GPIO, with detailed instructions:
https://pypi.org/project/Jetson.GPIO/
或者
https://github.com/NVIDIA/jetson-gpio

2.Pin diagram

GPIO and BCM Comparison Table

BCM编码	功能名	物理引脚		功能名	BCM编码
	3V3	1	2	5V	
2	SDA	3	4	5V	
3	SCL	5	6	GND	
4	D4	7	8	D14(TXD)	14
	GND	9	10	D15(RXD)	15
17	D17	11	12	D18	18
27	D27	13	14	GND	
22	D22	15	16	D23	23
	3V3	17	18	D24	24
10	D10	19	20	GND	
9	D9	21	22	D25	25
11	D11	23	24	D8	8
	GND	25	26	D7	7
0	D0(ID_SD)	27	28	D1(ID_SC)	1
5	D5	29	30	GND	
6	D6	31	32	D12	12
13	D13	33	34	GND	
19	D19	35	36	D16	16
26	D26	37	38	D20	20
	GND	39	40	D21	21

3.Environmental configuration

Environmental configuration

1、DownLoad jetson-gpio：

git clone https://github.com/NVIDIA/jetson-gpio

```
jetson@jetson-desktop:~$ git clone https://github.com/NVIDIA/jetson-gpio
Cloning into 'jetson-gpio'...
remote: Enumerating objects: 168, done.
remote: Counting objects: 100% (168/168), done.
remote: Compressing objects: 100% (97/97), done.
remote: Total 597 (delta 79), reused 135 (delta 48), pack-reused 429
Receiving objects: 100% (597/597), 128.43 KiB | 38.00 KiB/s, done.
Resolving deltas: 100% (267/267), done.
```

2、Move downloaded files to directory：　/opt/nvidia 中

If your directory exists in this library, we need to backup the original directory as follows:

```
nano@nano-desktop:/opt/nvidia$ sudo mv jetson-gpio jetson-gpio_bak
[sudo] password for nano:
nano@nano-desktop:/opt/nvidia$ ls
jetson-gpio_bak  l4t-usb-device-mode
nano@nano-desktop:/opt/nvidia$
```

Then place the downloaded folder in the opt/nvidia directory. Since I am placing the folder in the path~/and currently in opt/nvidia, I can execute the following command to move the folder.

```
sudo mv ~/jetson-gpio ./
```

```
jetson@jetson-desktop:/opt/nvidia$ sudo mv ~/jetson-gpio ./
[sudo] password for jetson:
jetson@jetson-desktop:/opt/nvidia$ ls
jetson-gpio  jetson-io  l4t-bootloader-config  l4t-usb-device-mode  vpi  vpi-0.4
jetson@jetson-desktop:/opt/nvidia$ cd ~
```

3、Install pip3 tool：

sudo apt-get install python3-pip

4、Enter the Jetson gpio library folder and install the library。

cd /opt/nvidia/jetson-gpio

sudo python3 setup.py install

```
creating dist
creating 'dist/Jetson.GPIO-2.0.12-py3.6.egg' and adding 'build/bdist.linux-aar
removing 'build/bdist.linux-aarch64/egg' (and everything under it)
Processing Jetson.GPIO-2.0.12-py3.6.egg
Copying Jetson.GPIO-2.0.12-py3.6.egg to /usr/local/lib/python3.6/dist-packages
Adding Jetson.GPIO 2.0.12 to easy-install.pth file

Installed /usr/local/lib/python3.6/dist-packages/Jetson.GPIO-2.0.12-py3.6.egg
Processing dependencies for Jetson.GPIO==2.0.12
Finished processing dependencies for Jetson.GPIO==2.0.12
```

5、Before using, you also need to create a GPIO group, add your current account to this group, and grant usage permissions

sudo groupadd -f -r gpio

sudo usermod -a -G gpio user_name

```
nano@nano-desktop:/opt/nvidia/jetson-gpio$ sudo groupadd -f -r gpio
nano@nano-desktop:/opt/nvidia/jetson-gpio$ sudo usermod -a -G gpio nano
```

sudo cp /opt/nvidia/jetson-gpio/lib/python/Jetson/GPIO/99-gpio.rules /etc/udev/rules.d/

In order for the new rule to take effect, you need to reboot or reload the udev rule by running the following command

```
sudo udevadm control --reload-rules && sudo udevadm trigger
```

Attention: user_ Name is the username you use, such as Jetson