tslib是电阻式触摸屏用于校准的一个开源程序软件库,能够为触摸屏驱动获得的采样提供诸如滤波、 去抖、校准等功能,通常作为触摸屏驱动的适配层,为上层的应用提供了一个统一的接口。这里先编 译安装 tslib,这样在后面编译 Qt 的时候才能打包编译进去。

1) 安装 autoconf、automake、libtool 包

apt-get install autoconf automake libtool libsysfs-dev g++

2) 下载文件 <u>https://github.com/kergoth/tslib</u>, 解压并编译:

tar -xvf tslib-1.4.tar.bz2

gedit ./tests/ts_calibrate.c

go to line227 &&line 229,

cal_fd = open (calfile, O_CREAT | O_RDWR, 0777);

cal_fd = open ("/etc/pointercal", 0_CREAT | 0_RDWR, 0777);

./tslib.sh 2>&1 | tee makeLog.txt

查看一下生成的文件是否为 ARM 运行文件: file bin/ts_test

编译完成后在-prefix 指定的主机目录下生成可用文件,修改 tslib/etc/ts.conf,去掉#号和空格:# module_raw input -> module_raw input, 然后将产生的整个 tslib 文件夹内容下载到开发板的对应路径下(/opt),并修改开发板环境变量。

4) 加载触摸屏驱动模块: modprobe ti_am335x_tsc.ko

允许校准程序进行校准: ./ts_calibrate,校准后在 tslib 的 etc 目录下生成校准文件。

如果触摸不准,需要删除之前的校准文件,重新校准:rm -rf /etc/pointercal*

运行测试: ./ts_print

2. 移植 qt

1)下载 qt-everywhere-opensource 和 qt-creator:

```
http://download.qt.io/archive/qt/
```

http://download.qt.io/new_archive/qt/

http://download.qt.io/official_releases/qt/

解压: tar -xvJf qt-everywhere-opensource-src-5.9.9.tar.xz -C /opt/

qt-everywhere-opensource-src-5.9.9

进入目录: cd qt-everywhere-opensource-src-5.9.9

2) 安装工具包: apt-get install g++-multilib libx11-dev libxext-dev libxtst-dev zlib1g-dev

lib32ncurses5 lib32z1 libpng-dev autoconf automake libtool lsb-core libqt4-dev

lib32stdc++6 libgl1-mesa-dev libXrender-dev libjpeg-dev

3) 复制脚本和配置文件,执行编译:

cp qmake.conf

/opt/qt-everywhere-opensource-src-5.9.9/qtbase/mkspecs/linux-arm-gnueabi-g++

cp qt-arm. sh qt-desktop. sh /opt/qt-everywhere-opensource-src-5.9.9/

查看配置帮助,将结果输出到文本 helpdoc.txt 中: ./configure -help > helpdoc.txt

make clean

make confclean

./qt-arm.sh 2>&1 | tee confLog.txt

make -j4 2>&1 | tee makeLog.txt

make install -j4 2>&1 | tee installLog.txt

4) 新建 fonts 文件夹并复制字体, QT 程序才能显示中文:

mkdir /opt/qt-arm-5.9.9/lib/fonts

cp STKAITI.TTF /opt/qt-arm-5.9.9/lib/fonts/

5)将编译好的/opt/qt-arm-5.9.9/bin下qmake 重命名为arm-qmake,然后拷贝到虚拟机/usr/bin下。

测试环境变量: qmake -v arm-qmake -v

此时在代码文件夹可以使用 make clean, make confclean, make 进行编译(需要 Makefile 文件)。

6)将编译好的/opt/qt-arm-5.9.9中的所有文件打包,并在 BeagleBone 开发板中新建文件夹解压:

cd /opt/qt-arm-5.9.9/

```
tar -cvf qt5.tar ./*
```

mkdir /opt/qt5

tar -xvf qt5.tar -C /opt/qt5

7) 在目标板/etc下的 profile 文件中添加环境变量 gedit /etc/profile

使环境变量生效: source /etc/profile

8)将编译器下 usr/lib, QT 缺失的库拷贝到目标文件系统对应目录下,加载触摸驱动,运行 QT 程序。

cp /mnt/libicuuc.so.62 /usr/lib

3. 安装 Qtcreator

Qtcreator 安装: ./qt-creator-opensource-linux-x86_64-4.11.2.run

安装目录选择: /opt/qtcreator-4.11.2

安装完成后, /opt/qtcreator-4.11.2/bin/qtcreator 即是可执行文件。

环境配置,在tools->options里面进行设置:

添加交叉编译器(arm-linux-gnueabihf-gcc)

Kits			
Kits Qt Versions Compilers Debuggers Qbs CMake			
Name	Туре		Add
 Auto-detected C++ 			Clone
GCC (C++, x86 64bit in /usr/bin)			Remove
* C			Remove All
GCC (C, x86 64bit in /usr/bin) GCC (C, arm 32bit in /opt/ti-processor-sdk-linux-am335x-evm-06.03.00.106/linux-devkit/sysroots/x86_64-arago-linux/usr/bin)	GCC		De detect
Clang (C, x86 64bit in /opt/qtcreator-4.11.2/libexec/qtcreator/clang/bin)	Clang		Re-delect
 Manual C++ 			Auto-detection Settings
ARM-GCC++	GCC		
	600		
Name: ARM-GCC			
Compiler paths		Browro	
Complete path. approximate and a second seco	In an average and a second s	browse	
Platform codegen flags:			
Platform linker flags:			
ABI: arm-linux-generic-elf-32bit *	arm • linux • generic • elf • -	32bit 👻	

添加 qmake 编译工具



添加构建套件 (Kit)

Kits																																
Kits	Qt Versions	Compilers	Debuggers	Qbs (Make																											
Name																															Ade	d
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	Desktop (de	fault)				_	_	_	_	_	_	_	_	_	_												_				temo	ove
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File s	system name:																															
Devi	ce type:		Generic Linux D	evice	>																										•	
Devi	ce:																														- N	Manage
Sysro	oot:	<	/opt/ex/qt5	>																											E	Browse
	- 11	0	C: ARM-GCC] _	120200
Com	piler:		ARM-CCC	-																											- L	Manage
Envir	onment:		No changes to a	oply.																											(Change
Debu	ugger:		System GDB at	/usr/bin/g	db																											Manage
Qt ve	ersion:	<	Qt 5.9.9 (qt-arm	-5.9.9)	•																										- •	Manage
Qt m	kspec:																															
Addi	tional Qbs Prof	ile Settings:																													(Change
CMa	ke Tool:		System CMake a	it /opt/ti-	processor	-sdk-lin	inux-a	-am3	335x-	k-evm	n-06.(.03.00	0.106/	/linux-	devki	it/sysro	oots/x8	6_64-ara	ago-lin	ux/usr,	/bin/	/cmake	e									Manage
CMa	ke generator:		CodeBlocks - Un	x Makefi	es, Platfo	rm: <no< td=""><td>ione>,</td><td>>, To</td><td>oolse</td><td>et: <r< td=""><td>none</td><td>e></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>(</td><td>Change</td></r<></td></no<>	ione>,	>, To	oolse	et: <r< td=""><td>none</td><td>e></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>(</td><td>Change</td></r<>	none	e>																			(Change
CMa	ke Configuratio	n: (CMAKE_CXX_CC	MPILER:	STRING=%	{Compi	piler:F	r:Exec	ecutal	able:	:Cxx};	; CM/	AKE_C	с_сом	PILE	R:STRI	ING=%{	Compile	r:Execu	utable:	:C}; C	MAKE	E_PREF	IX_PAT	TH:STR	RING=%	6{QEQT	INSTALL	PREFIX}	QT_QMAK	🤇	Change

添加 Debuggers, 点击"Debuggers -> Browse…", 选择对应平台 GDB, 具体 路 径 为

 $/{\tt TI-SDK}/{\tt linux-devkit/sysroots/x86_64-arago-{\tt linux/usr/bin/arm-linux-gnueabihf-gdb}}$

Kits									
Kits Qt Versions	Compilers Debuggers	Qbs CMake							
Name	Location						Туре		Add
 Auto-detected System GDB al 	/usr/bin/gdb /usr/bin/gdb						GDB		Clone
 Manual BBBS Debugg 	er /opt/ti-proce	ssor-sdk-linux-am	335x-evm-06.03.00.106/linux-devl	kit/sysroots/x86_64-a	rago-linux/usr/bin/a	arm-linux-gnueabihf-g	db GDB		Remove
	anach I an								
Name:	RBB2 Depudder								
Path: <	/opt/ti-processor-sdk-linux	-am335x-evm-06.0	3.00.106/linux-devkit/sysroots/x86	_64-arago-linux/usr/bir	n/arm-linux-gnueabih	f-gdb		Browse	
Туре:	GDB								
ABIs:	arm-linux-generic-elf-32bit								
Version:	8.2.0								
Working directory								Browse	

注: QtCreator 使用 QT 开发,在 QtCreator 菜单 -> 帮助 -> 关于 QtCreator 就可以查看对应版本。

4. 虚拟机中运行 QT 程序

make clean

make confclean

```
./qt-desktop.sh 2>&1 | tee confLog.txt
```

查看 log, 可知使用 mkspecs/linux-g++下的 qmake.conf

如果编译出错,有可能系统的 gcc 版本不够,需要升级为 gcc 8。

make -j4 2>&1 | tee makeLog.txt

make install -j4 2>&1 | tee installLog.txt

编译成功后,需要拷贝字体

```
mkdir /opt/qt-5.9.9/lib/fonts
```

```
cp STKAITI.TTF /opt/qt-5.9.9/lib/fonts/
```

设置 Kit 如下:

Kits		
Kits Qt Versions Comp	illers Debuggers Qbs CMake	
Name		Add
Auto-detected * Manual		Clone
A BBBS		Remove
- Desktop (dej daity	Ma	ke Default
	Sett	ings Filter
	Default	Settings Filter
Name:	Desktop	Q,
File system name:		
Device type:	Desktop	-
Device:	Local PC (default for Desktop)	Manage
Sysroot:		Browse
Compiler:	e GCC 5 (C, x86 64bit in /usr/bin) C++: GCC 5 (C++, x86 64bit in /usr/bin)	Manage
Environment:	No changes to apply.	Change
Debugger:	System GDB at /usr/bin/gdb	Manage
Qt version:	Q£ 5.9.9 (qt-5.9.9)	Manage
Qt mkspec:		
Additional Qbs Profile Sett	ings:	Change
CMake Tool:	System CMake at /opt/ti-processor-sdk-linux-am335x-evm-06.03.00.106/linux-devkit/sysroots/x86_64-arago-linux/usr/bin/cmake	Manage
CMake generator:	CodeBlocks - Unix Makefiles, Platform: «none», Toolset: «none»	Change
CMake Configuration:	CMAKE_CXX_COMPILER:STRING=%{Compiler:Executable:Cxx}; CMAKE_C_COMPILER:STRING=%{Compiler:Executable:C}; CMAKE_PREFIX_PATH:STRING=%{Qt:QT_INSTALL_PREFIX}; QT_QMAK	Change

Kits																		
Kits	Qt Versions	Compilers	Debuggers	Qbs	CMake													
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Vers qma No q	ion name: Qt ke location: /or mlscene install	%{Qt:Versior t/qt-5.9.9/bir ed.	1} (qt-5.9.9) 1/qmake															
Qt v	ersion 5.9.9 for	Desktop																

在虚拟机的运行效果:

8 🖶 🗈 MainWindow	
Hello Qt5! 中文!	
Information Really to clear data?	
▲ No ▲ Yes	