GOWARRIOR

GoDroid

GoDroid

Application Notes

How to Change Android Fonts

v1.1

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Preface

Overview

This manual provides step-by-step details about the process change the fonts in Android platform.

- **Chapter 1: Introduction**

This chapter introduces the fonts supported by Android and two methods to change the fonts attribute.

- **Chapter 2: Using System Fonts**

This chapter provides compact description on how to use system fonts.

- **Chapter 3: Customizing Android Fonts**

This chapter gives details on how to customize fonts applied in Android.

Audience

This manual is primarily written to provide complete guidance for those who wants to exploit GoWarrior TIGER Board, such as makers, tinkers, innovators, students, etc.

Applicable Products

This manual is applicable for the GoWarrior TIGER Board.

Reference Documents

N/A

Conventions

Typographical Conventions

Item	Format
codes, keyboard input commands, file names, equations, and math	Courier New, Size 10.5
Variables, code variables, and code comments	*Courier New, Size, Italic*
Menu item, buttons, tool names	**Ebrima, Size 10.5, Bold** e.g. Select **USB Debugging**
Screens, **windows**, dialog boxes, and tabs	**Ebrima, Size 10.5, Bold** **Enclosed in double quotation marks** e.g. Open the **"Debug Configuration"** dialog box

Table 1. Typographical Conventions

Symbol Conventions

Item	Description
Caution	Indicates a potential hazard or unsafe practice that, if not avoided, could result in data loss, device performance degradation, or other unpredictable results.
Note	Indicates additional and supplemental information for the main contents.
Tip	Indicates a suggestion that may help you solve a problem or save your time.

Table 2. Symbol Conventions

How to Contact Us

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For questions regarding GoWarrior, contact our support team at the email listed below:

support@gowarriorosh.com

1 Introduction

There are three basic kinds of default typefaces for Android platform which are known as the Droid font family. The fonts are intended for use on the small screens. The Droid font family consist of Serif, Sans-serif and Monospace.

Figure 1. Android Typefaces

- **Serif typeface:** The serif typeface consists of Regular, Bold, Italic and Bold Italic fonts. The term "serif" comes from the Dutch word, meaning "line". In typography, a serif is a small line used to finish off a main stroke of each letter or symbol. A typeface with serifs is called a Serif typeface. Examples of serif typeface include, Times New Roman, Georgia.
- **Sans-serif typeface:** The sans-serif typeface consists of Regular, Bold, Italic and Bold Italic fonts. The term "sans" comes from the French word, meaning "without". So in typography, a San-serif font tends to have no stroke line at the end of each letter or symbol. A san-serif typeface is one that does not have the small projecting features called "serifs" at the end of strokes. Examples of san-serif fonts include, Verdana and Arial.
- **Monospace typeface**: The monospace typeface consists of only regular font to provide a more prominent differentiation between the two characters. In monospace typeface each letter and character occupies the same amount of horizontal space. Examples of monospace

typefaces include, Courier, Courier New, Lucida Console, Monaco, and Consolas.

There are generally two methods of changing Android font on GoDroid, the first method is to make full use of the system fonts; and the second is to customize fonts in your application to extend the Android fonts library.

Chapter 2 will introduce the first method and Chapter 3 will introduce the second method.

2 Using System Fonts

This chapter summarizes how to make full use of system fonts in Android applications.

2.1 Introduction of System Fonts

In AOSP, all the font-related files are located in the directory `frameworks/base/data/fonts/`. These files include various types of .ttf font files and font resource definition XML files such as system_fonts.xml, fallback_fonts.xml, and vendor_fonts.xml, as shown below.

```
arvin.zhou@shsa02:~/android/frameworks/base/data/fonts$ tree -L 1
.
|-- Android.mk
|-- DroidSans.ttf
|-- DroidSerif-BoldItalic.ttf
|-- DroidSerif-Bold.ttf
|-- DroidSerif-Italic.ttf
|-- DroidSerif-Regular.ttf
|-- fallback_fonts.xml
|-- fonts.mk
|-- system_fonts.xml
`-- vendor_fonts.xml
```

For images generated by AOSP, their font files (.ttf) are placed in the directory `/system/fonts/`.

```
/system/fonts # ls
AndroidClock.ttf
```

```
AndroidClock_Highlight.ttf…
```

But XML files related to fonts are placed in the directory `/system/etc/`.

```
/system/etc # ls

fallback_fonts.xml

system_fonts.xml…
```

2.2 system_fonts.xml

system_fonts.xml defines the default font files used by three types of typefaces (serif, sans-serif, and monospace). For example, serif uses DroidSerif-Regular.ttf by default; san-serif uses Roboto-Regular.ttf by default, while monospace uses DroidSansMono.ttf by default. These three kinds of fonts are applied by defining the attribute of ***android: typeface*** in the `layout.XML` file. Detailed information can be found in *2.3 How to Use System Fonts.*

In the case of sans-serif, the corresponding definition in `system_fonts.xml` is as follows. Furthermore, it also defines the `.ttf` files used by Bold, Italic, and Bold Italic in sans-serif that are `Roboto-Bold.ttf`, `Roboto-Italic.ttf` and `Roboto-BoldItalic.ttf`.

```
<familyset>
    <family>
        <nameset>
            <name>sans-serif</name>
            <name>arial</name>
            <name>helvetica</name>
            <name>tahoma</name>
            <name>verdana</name>
        </nameset>
```

```
        <fileset>
            <file>Roboto-Regular.ttf</file>
            <file>Roboto-Bold.ttf</file>
            <file>Roboto-Italic.ttf</file>
            <file>Roboto-BoldItalic.ttf</file>
        </fileset>
    </family>
</familyset>
```

Besides defining the three default fonts (serif, sans-serif and monospace), the `system_fonts.xml` also defines some extended fonts, such as sans-serif-light, sans-serif-thin, and sans-serif-condensed and Droid Sans. The extended fonts are applied by defining the attribute of *`android:fontFamily`* in the `layout XML` file. The following pieces of codes are the XML segment for sans-serif-condensed definition.

```
    <family>
        <nameset>
            <name>sans-serif-condensed</name>
        </nameset>
        <fileset>
            <file>RobotoCondensed-Regular.ttf</file>
            <file>RobotoCondensed-Bold.ttf</file>
            <file>RobotoCondensed-Italic.ttf</file>
            <file>RobotoCondensed-BoldItalic.ttf</file>
        </fileset>
    </family>
```

2.3 How to Use System Fonts

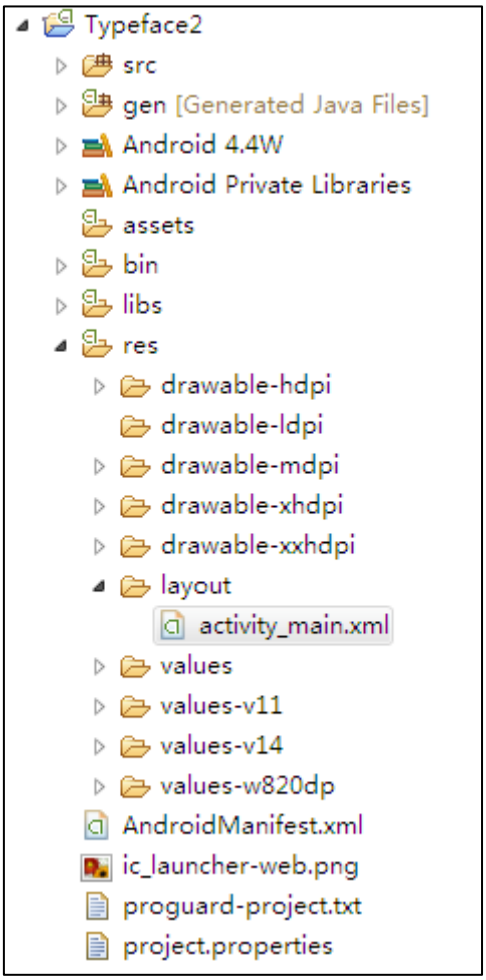

Figure 2. Sample Project of Using System Fonts

In the above sample project, the first three TextViews in `activity_main.xml` use the default three kinds of fonts (sans-serif, serif and monospace) by defining the `android:typeface` attribute. The fourth TextView uses the Sans-serif-condensed font by defining the `android:fontFamily` attribute.

The complete codes of `layout/activity_main.xml` are shown as below:

```
<TableLayout
xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
```

```
    android:paddingBottom="@dimen/v_margin"
    android:paddingLeft="@dimen/h_margin"
    android:paddingRight="@dimen/h_margin"
    android:paddingTop="@dimen/v_margin"
    tools:context="com.alitech.arvin.typeface2.MainActivity" >

<TableRow>
        <TextView
            android:layout_marginRight="@dimen/h_margin"
            android:text="@string/sans"
            android:textSize="36sp" >
        </TextView>
        <!—Use default sans-serif font -->
        <TextView
            android:id="@+id/sans"
           android:text="@string/text"
            android:textSize="36sp"
            android:typeface="sans" >
        </TextView>
    </TableRow>

    <TableRow>
        <TextView
            android:layout_marginRight="@dimen/h_margin"
            android:text="@string/serif"
            android:textSize="36sp" >
        </TextView>
       <!--  Use default serif font -->
        <TextView
            android:id="@+id/serif"
            android:text="@string/text"
            android:textSize="36sp"
            android:typeface="serif" >
        </TextView>
    </TableRow>

    <TableRow>
        <TextView
            android:layout_marginRight="@dimen/h_margin"
            android:text="@string/monospace"
            android:textSize="36sp" >
        </TextView>
        <!—Use default monospace font -->
```

```
        <TextView
            android:id="@+id/monospace"
            android:text="@string/text"
            android:textSize="36sp"
            android:typeface="monospace" >
        </TextView>
    </TableRow>

    <TableRow>
        <TextView
            android:layout_marginRight="@dimen/h_margin"
            android:text="@string/custom"
            android:textSize="36sp" >
        </TextView>
        <!—Use sans-serif-condensed font -->
        <TextView
            android:id="@+id/custom"
            android:text="@string/text"
            android:textSize="36sp"
            android:fontFamily= "sans-serif-condensed"
        </TextView>
    </TableRow>

</TableLayout>
```

The program running result is as follows.

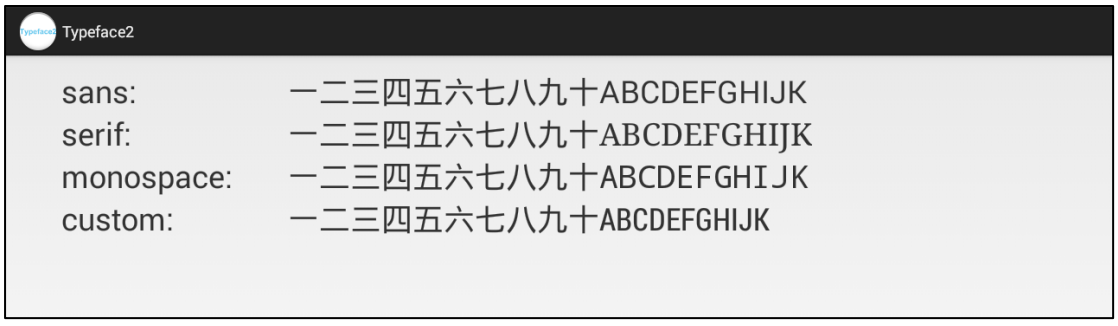

Figure 3. Display Effect of Used System Fonts

3 Customizing Android Fonts

This chapter explains how to customize Android fonts in your applications with the help of practical examples.

3.1 Preparing Font Files

Place the font files (`.ttf` files) in the `assets/font/` folder of the applications, as shown in Figure 4. In this regard there are two kinds of fonts available in the folder (Castellar and Courier New).

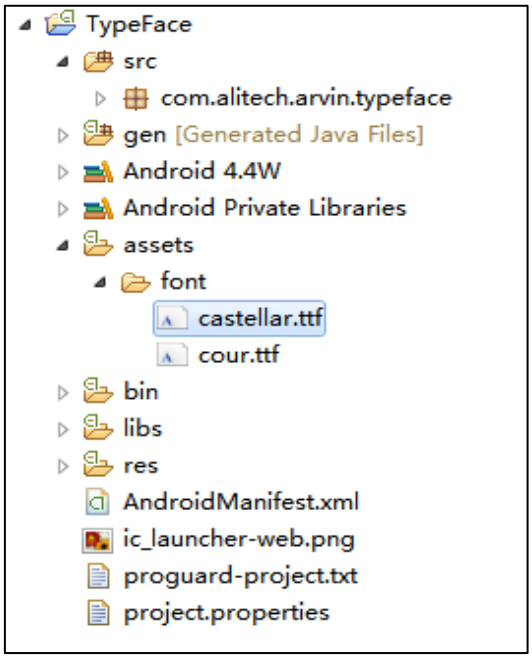

Figure 4. Path of Font Files

3.2 Customizing Android Fonts

Procedure:

1. Use the font files prepared in the previous section to instantiate a Typeface object in the program.

```
private Typeface mFaceCour;
private Typeface mFaceCastellar;

mFaceCour = Typeface.createFromAsset(getContext().getAssets(),
                "font/cour.ttf");
mFaceCastellar = Typeface.createFromAsset(getContext().getAssets(),
                "font/castellar.ttf");
```

2. Set this *Typeface* object to *Paint* object or *TextView/Button/EditText* object. Take an example of *Paint* object for the following codes.

```
private Paint mPaint = new Paint(Paint.ANTI_ALIAS_FLAG);

mPaint.setTypeface(null);  //Use the default font
canvas.drawText("Default: ABCDEFGHIJK", 50, 100, mPaint);

mPaint.setTypeface(mFaceCour); //Use the Courier New font
canvas.drawText("Courier New: ABCDEFGHIJK", 50, 200, mPaint);

mPaint.setTypeface(mFaceCastellar); // Use the Castellar font
canvas.drawText("Castellar: ABCDEFGHIJK", 50, 300, mPaint);
```

The program running result is shown as below:

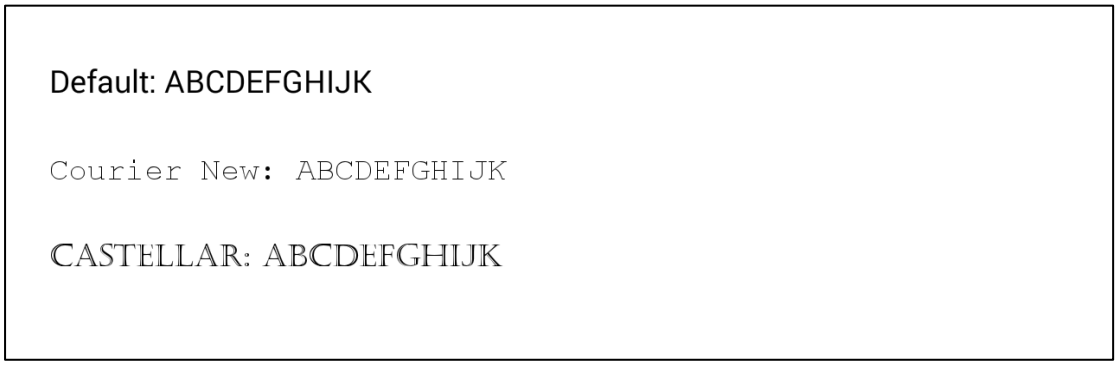

Figure 5. Display Effects of Customized Fonts

The complete codes are shown as below:

```
package com.alitech.arvin.typeface;

import android.app.Activity;
import android.content.Context;
import android.graphics.Canvas;
import android.graphics.Color;
import android.graphics.Paint;
import android.graphics.Typeface;
import android.os.Bundle;
import android.view.View;


public class MainActivity extends Activity {

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(new FaceView(this));
    }

    private static class FaceView extends View {
        private Paint    mPaint = new Paint(Paint.ANTI_ALIAS_FLAG);
        private Typeface mFaceCour;
        private Typeface mFaceCastellar;

        public FaceView(Context context) {
            super(context);
            mFaceCour = Typeface.createFromAsset(
                      getContext().getAssets(),"font/cour.ttf");
            mFaceCastellar = Typeface.createFromAsset(
                      getContext().getAssets(), "font/castellar.ttf");
            mPaint.setTextSize(36);
        }

        @Override protected void onDraw(Canvas canvas) {
            canvas.drawColor(Color.WHITE);
            mPaint.setTypeface(null);
            canvas.drawText("Default: ABCDEFGHIJK", 50, 100, mPaint);

            mPaint.setTypeface(mFaceCour);
            canvas.drawText("Courier  New:  ABCDEFGHIJK",  50,  200,
```

```
mPaint);

            mPaint.setTypeface(mFaceCastellar);
            canvas.drawText("Castellar: ABCDEFGHIJK", 50, 300, mPaint);
        }
    }
}
```

Revision History

Document Changes

Revision	Changes	Date
v1.1	Updated document version to 1.1.	February 29, 2016
v1.0	Initial Release	September 07, 2015

Table 3. Document Change History

Software Changes

Revision	Changes	Date
v1.1	Install and start GoDroid with a MicroSD card.	February 29, 2016
v1.0	Initial Release	September 07, 2015

Table 4. Software Change History

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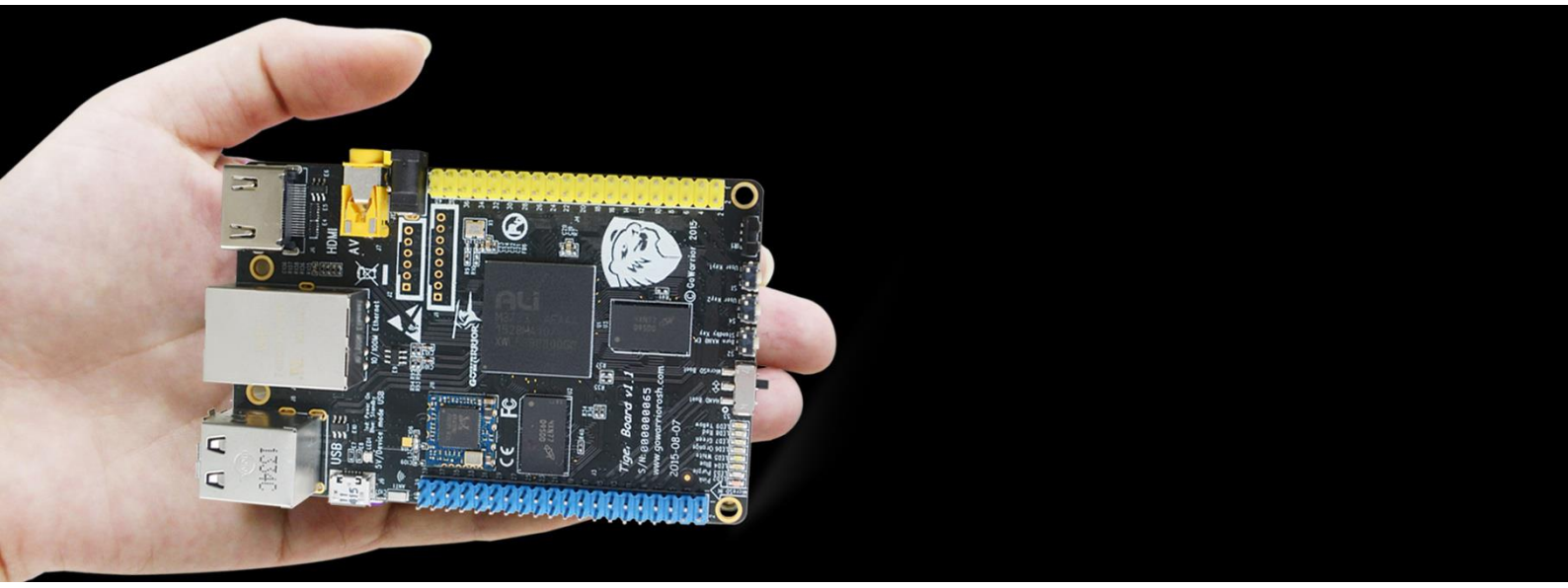
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