

Mobile and Wireless Systems Programming

LWUIT The Lightweight User Interface Toolkit



Introduction

- MIDP has two UI layers high level and low level
 - High level : heavyweight components, limited lightweight component support
 - Lowlevel is similar to SE 1.0 Graphics : no scaling, hard coded fonts etc...
- Device fragmentation : separate JAR for every device
- Difficult to program simple things (no modal Dialogs, no list customization...)

What is LWUIT ?

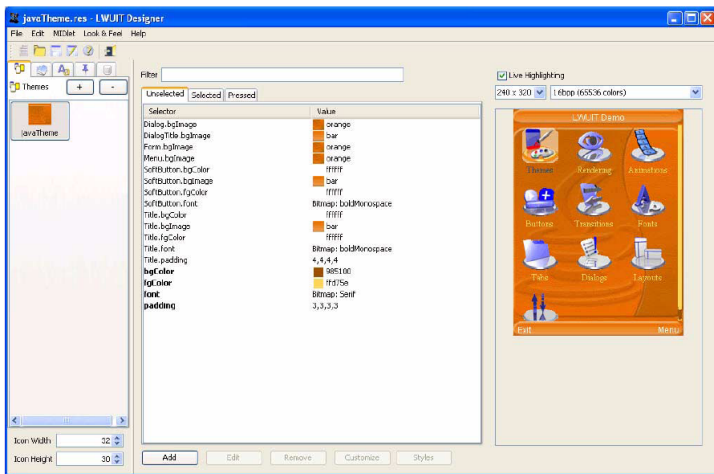
- Advanced UI library
- Lightweight on low level graphics
- Inspired by Swing : Single Threaded, Extensible, Hierarchy composite, Layouts, MVC...
- Consistent across devices (one JAR for all) -> not really true !
- Mass market devices - MIDP 2.0, CLDC 1.1
- Portable : MIDP, CDC, Android, SE, Blackberry...

Key Features

- UI Controls (Swing-like)
- XHTML support
- Bitmap Fonts
- Touch Screen
- Animations and Transitions
- Virtual keyboard support
- 3D and SVG Graphics Integration
- Look and Feel and Themes
- Highly customizable
- Bi-directional text support

Resource Editor

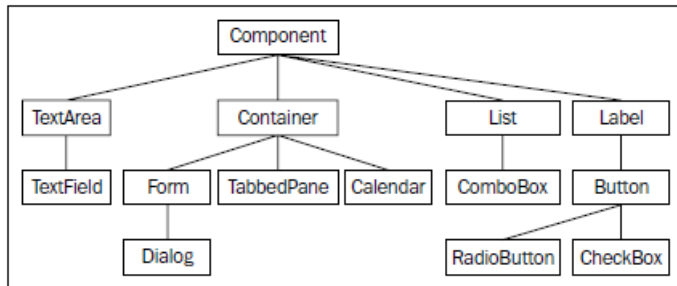
- A standalone GUI tool
- Live preview
- .res file : Image Resources, Dynamic Fonts, Localization, Themes



Jar file

- Open source
- Jar file (Version 1.4 : 541 KB)
- Packages : `com.sun.lwuit.*`
 - `com.sun.lwuit`
 - `com.sun.lwuit.animations`
 - `com.sun.lwuit.events`
 - `com.sun.lwuit.geom`
 - `com.sun.lwuit.impl`
 - `com.sun.lwuit.impl.midp`
 - `com.sun.lwuit.layouts`
 - `com.sun.lwuit.list`
 - `com.sun.lwuit.painter`
 - `com.sun.lwuit.plaf`
 - `com.sun.lwuit.util`

Widgets



HelloWorld

```
import javax.microedition.midlet.*;
import com.sun.lwuit.*;
import com.sun.lwuit.events.*;

public class HelloWorld extends MIDlet implements ActionListener {
    public void startApp() {
        Display.init(this);

        Form f = new Form("Hello World!");

        f.show();

        Command exitCommand = new Command("Exit");
        f.addCommand(exitCommand);
        f.setCommandListener(this);
    }

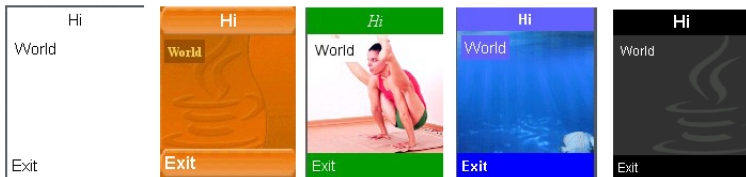
    public void pauseApp() {}

    public void destroyApp(boolean unconditional) {}

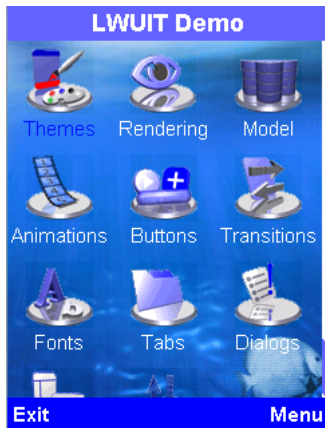
    public void actionPerformed(ActionEvent ae) {
        notifyDestroyed();
    }
}
```


HelloWorld

```
Resources r = Resources.open("/myTheme.res");  
UIManager.getInstance().setThemeProps(r.getTheme("theme"));
```



Demo



Drawbacks

- Performance on some old mobiles
- Huge final jar size ? 541 KB + Application size → Obfuscation
- Portability issue related to some mobiles !

Conclusion

- Userfriendly and useful for developers (prototype and demo)
- Some links :
 - Main developer blog : <http://lwuit.blogspot.com/>
 - Official page : <http://java.sun.com/javame/technology/lwuit/>
 - Javadoc :
<https://lwuit.dev.java.net/nonav/javadocs/index.html>