# Android Applications

Project report submitted in partial fulfillment of the requirement for the degree of Bachelor of Technology

in

**Computer Science and Engineering**

By

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Under the supervision of

**Dr. Sakshi Babbar**

to

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# CERTIFICATE

## Candidate’s Declaration

I hereby declare that the work presented in this report entitled **“Android Applications”** in partial fulfillment of the requirements for the award of the degree of **Bachelor of Technology** in **Computer Science and Engineering/Information Technology** submitted in the department of Computer Science & Engineering and Information Technology**,** Jaypee University of Information Technology Waknaghat is an authentic record of my own work carried out over a period from August 2015 to May 2016 under the supervision of **Dr. Sakshi Babbar,** Assistant Professor (Senior Grade) of CSE Department.

The matter embodied in the report has not been submitted for the award of any other degree or diploma.

(Student Signature)

Deepanker Jain(121318)

Shashwat Singh(123207)

This is to certify that the above statement made by the candidate is true to the best of my knowledge.

(Supervisor Signature)

Dr.Sakshi Babbar

Assistant Professor(Senior Grade)

Computer Science Department

Dated:

# ACKNOWLEDGEMENT

We would like to express our special thanks of gratitude to our supervisor **Dr. Sakshi Babbar** who gave us the golden opportunity to do this wonderful project on Android Applications, which also helped us in doing a lot of research and we came to know about so many new things about android. We are really thankful to her.

Date:

Name of the students:
Deepanker Jain
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# ABSTRACT

In recent years, the emergence of smart phones has changed the definition of mobile phones. Phone is no longer just a communication tool, but also an essential part of the people's communication and daily life. Various applications added unlimited fun for people's lives. It is certain that the future of the network will be the mobile terminal. Now the Android system in the electronics market is becoming more and more popular, especially in the smartphone market. Because of the open source, some of the development tools are free, so there are plenty of applications generated.

So our aim is to develop an android application to give information about the details of International Conference on Image Information Processing and  to develop a media player which can run almost any  media content in any form.

# CHAPTER 1: INTRODUCTION

## 1.1 Introduction

In recent years, the emergence of smart phones has changed the definition of mobile phones. Phone is no longer just a communication tool, but also an essential part of the people's communication and daily life. Various applications added unlimited fun for people's lives. It is certain that the future of the network will be the mobile terminal. Now the Android system in the electronics market is becoming more and more popular, especially in the smartphone market. Because of the open source, some of the development tools are free, so there are plenty of applications generated. This greatly inspired the people to use the Android system. In addition, it provides a very convenient hardware platform for developers so that they can spend less effort to realize their ideas. This makes Android can get further development . As the smart phones and Android system getting popular, the operations like listening to music, watching videos, tweeting and some others can be moved from the computer to a phone now. The applications on the market today are mostly commercial applications, and contain a large number of built-in advertising. If the user prefers to remove the built-in advertising, a certain price must be paid to reach that and this is not convenient. Meanwhile, because of the unfair competition of IT, many applications built illegal program to steal user information and cause some damage to user’s personal privacy. Sometimes, users will pay more attention to the user experience of software. Therefore, the development of the application can not only be limited to the function, more attention should be paid to the user's experience. After studying some previous Android applications and access to large amounts of materials, we utilize the Java language, the Eclipse platform, Android ADT and the Android SDK to develop these three mobile applications. These systems have a nice interface and smooth operation. These Apps won’t steal any personal information, but can exclude useless information and bring a wonderful user experience.

### 1.1.1 Android

Android is a mobile operating system (OS) currently developed by Google, based on the Linux kernel and designed primarily for touchscreen mobile devices such as smartphones and tablets. Android's user interface is mainly based on direct manipulation, using touch gestures that loosely correspond to real-world actions, such as swiping, tapping and pinching, to manipulate on-screen objects, along with a virtual keyboard for text input. In addition to touchscreen devices, Google has further developed Android TV for televisions, Android Auto for cars, and Android Wear for wrist watches, each with a specialized user interface. Variants of Android are also used on notebooks, game consoles, digital cameras, and other electronics.Initially developed by Android, Inc., which Google bought in 2005, Android was unveiled in 2007, along with the founding of the Open Handset Alliance – a consortium of hardware, software, and telecommunication companies devoted to advancing open standards for mobile devices. As of July 2013, the Google Play store has had over one million Android applications ("apps") published, and over 50 billion applications downloaded. An April–May 2013 survey of mobile application developers found that 71% of developers create applications for Android, and a 2015 survey found that 40% of full-time professional developers see Android as their priority target platform.

**Figure1.Android Logo**

### 1.1.2 Android Architecture

We studied the Android system architecture. Android system is a Linux-based system, Use of the software stack architecture design patterns . As shown in Figure 1, the Android architecture consists of four layers: Linux kernel, Libraries and Android runtime, Application framework and Applications [5-8]. Each layer of the lower encapsulation, while providing call interface to the upper.

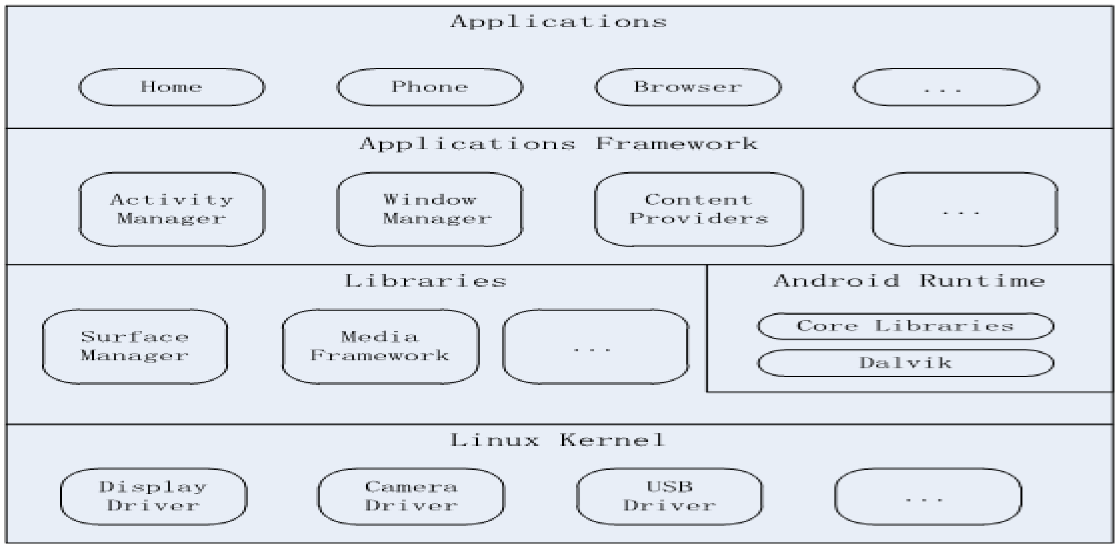


**Figure2. Android Architecture**

**A) Applications:**

Android app will be shipped with a set of core applications including client, SMS program, calendar, maps, browser, contacts, and others. All these application programs are developed in Java.

**B) Application Framework :**

The developer is allowed to access all the API framework of the core programs. The application framework simplifies the reuse of its components. Any other app can release its functional components and all other apps can access and use this component (but have to follow the security of the framework). Same as the users can be able to substitute the program components with this reuse mechanism

**C) Libraries and Android Runtime**

The library is divided in to two components: Android Runtime and Android Library. Android Runtime is consisted of a Java Core Library and Dalvik virtual machine. The Core Library provides Java core library with most functions. Dalvik virtual machine is register virtual machine and makes some specific improvements for mobile device. Android system library is support the application framework, it is also an important link connecting between application framework and Linux Kernel. This system library is developed in C or C++ language. These libraries can also be utilized by the different components in the Android system. They provide service for the developers through the application framework.

**D) Linux Kernel**

The kernel system service provided by Android inner nuclear layer is based on Linux 2.6 kernel, Operations like internal storage, process management, internet protocol, bottom-drive and other core service are all based on Linux kernel.

### 1.1.3 Software Development Kit(SDK)

A software development kit (SDK or "devkit") is typically a set of software development tools that allows the creation of applications for a certain software package, software framework, hardware platform, computer system, video game console, operating system, or similar development platform. To create applications you have to download this software development kit. For example, if you want to create an Android app you require an SDK with java programming, for iOS apps you require an iOS SDK with swift language, and to develop MS Windows apps you require the .net language. There are also SDKs that are installed in apps to provide analytics and data about activity. Prominent examples include Google and Facebook.

### 1.1.4 Android Studio

Android Studio is an integrated development environment (IDE) for developing for the Android platform. It was announced on May 16, 2013 at the Google I/O conference. Android Studio is freely available under the Apache License 2.0. Android Studio was in early access preview stage starting from version 0.1 in May 2013, then entered beta stage starting from version 0.8 which was released in June 2014. The first stable build was released in December 2014, starting from version 1.0. Based on JetBrains' IntelliJ IDEA software, Android Studio is designed specifically for Android development. It is available for download on Windows, Mac OS X and Linux, and replaced Eclipse Android Development Tools (ADT) as Google's primary IDE for native Android application development.

**Figure3.Android Studio Logo**

## 1.2 Problem Statement:

**1.2.1** To develop an android application to give information about the details of International Conference on Image Information Processing. This application will allow all users to receive all kinds of information regarding ICIIP such as Program schedule, Keynote Speakers, Important Dates, etc. User can access this application anywhere and anytime using his or her Smartphone.

**1.2.2** Many users like to watch video and listen to music using their mobile phone, but the media player has many limitations. With a rapid development of communication and network, multimedia based technology is adopted in media player. So our aim is to develop a media player which can run almost any media content in any form.

## 1.3 Objective

There are 5 objectives in this project:

1. To setup Android software development kit.
2. To write a program that can do various tasks such as running media(audio & video), displaying information, sending notifications, Bitmapping, asynchronous multi-tasking.
3. Crash handling and debugging.
4. Generating signed APK.
5. Upload application on  Google Playstore.

## 1.4 Methodology

This project is made by using Android studio, Virtual emulator and Photoshop. The programming languages used for building the application are Java, XML and C++.
User interface is handled using XML codes. Backend programming is handled mainly through set of java codes. Native libraries are accessed through set of predefined C++ codes.

The other libraries required are:

- Android SDK tools
- Android SDK platform tools
- Android SDK build tools
- SDK platform
- ARM EABI v7a System Image
- Intel x86 Atom_64 System Image
- Google APIs

- Google APIs ARM EABI v7a System Image
- GPU Debugging tools
- Android Support Library
- Google play services
- Google USB drivers
- Google Web drivers
- Intel x86 Emulator Acclerator(HAXM installer)

## 1.5 Organization:

As an overview, the structure of this report is organized as follows:

**Chapter 1** Describes a general introduction of the project, problem statement project aims and project scope.

**Chapter 2** Provides details literature review that includes an introduction to some basic concepts and a survey of existing works in the areas of developing the android application. This chapter explains in detail all the researches, studies, theories and gathering that have been make throughout the project.

**Chapter 3** Discusses the system and design of the project which provides a detailed description of the design to develop an application.

**Chapter 4** Discusses about the result and Screenshots.

**Chapter 5** Concludes the project and gives suggestions for future work.

# CHAPTER 2 : LITERATURE REVIEW

**Paper 1:** Research and Development of Mobile Application for Android Platform

The authors in [1] have tested the app in three environments including hardware, software and network. Test hardware environment is Lenovo Y460 laptop and millet M1 phone; software environment is windows 7 and phone system environment is android 4.0.3. Network environment is China Mobile which is 10M broadband, WIFI LAN and China Mobile GPRS network.By testing each function on mobile phone and the computer simulator, the result showed that video player and audio player run well and no advertising. Sina weibo client can successfully complete OAuth2.0 certificate authority and login and collect the basic data of the user information from sina server and no redundant information. Expected effect is achieved after testing all the functions. They says that since the Weibo client has to access to the network, when tested on an android phone, the performance under the environment of WIFI network and mobile 2G GPRS network can meet the expected requirements.

**Paper 2:** Research on Development of android Applications.

This article [2] gives a detailed introduction of android application framework and the working principal of android applications. Finally, a music player on the android platform was put forward as an example to illustrate this mechanism.

**Paper 3:** The android Application Development College Challenge

The authors in [3] say that android application development college challenge has only been held two times, but it greatly encourages and promotes the creativity of the college students. With more and more competitive teams participating the contest, it will be harder to win an award. However, many exciting applications will be presented in the contest. This challenge gives us an opportunity to learn about that a lot of ideas we think about can be implemented on android platform. At the same time, the contest provides a stage for android developer to discuss and communicate with each other. This can effectively promote the development of android and attract more software engineers to develop applications on android platform.

**Paper 4**: A model driven approach for android applications development

This paper [4] proposes a MDE approach for android applications development, which addresses how to model specific aspects of android applications, as intent and a data/service request, using standard UML notations. Moreover, it supports static and behavioral code generation from UML class and sequence diagrams, according to the rules imposed by the android platform. To demonstrate our approach, a case study was conducted, in which an android application was modeled in UML and code was generated from it. To generate code, the extension of GenCode was used. However, the actual version of GenCode tool that supports the proposed approach, only made an automatic transformation from UML class and sequence diagrams to the target android Java code, without consider any optimization in the generated code. As future work, we plan to extend this tool in order to consider the good practices for android development , and thus generating efficient code.

**Paper 5**: Design of Android based Media Player

This paper[5] proposes that many users like to watch video by a mobile phone, but the media player has many limitations. With a rapid development of communication and network, multimedia based technology is adopted in media player. Different approaches of media player shown in this paper are plug-in extension technology, multimedia based on hierarchy, media player based on file browser, media player based on FFmpeg (Fast Forward Moving Picture Expert Group), media player based on file server.

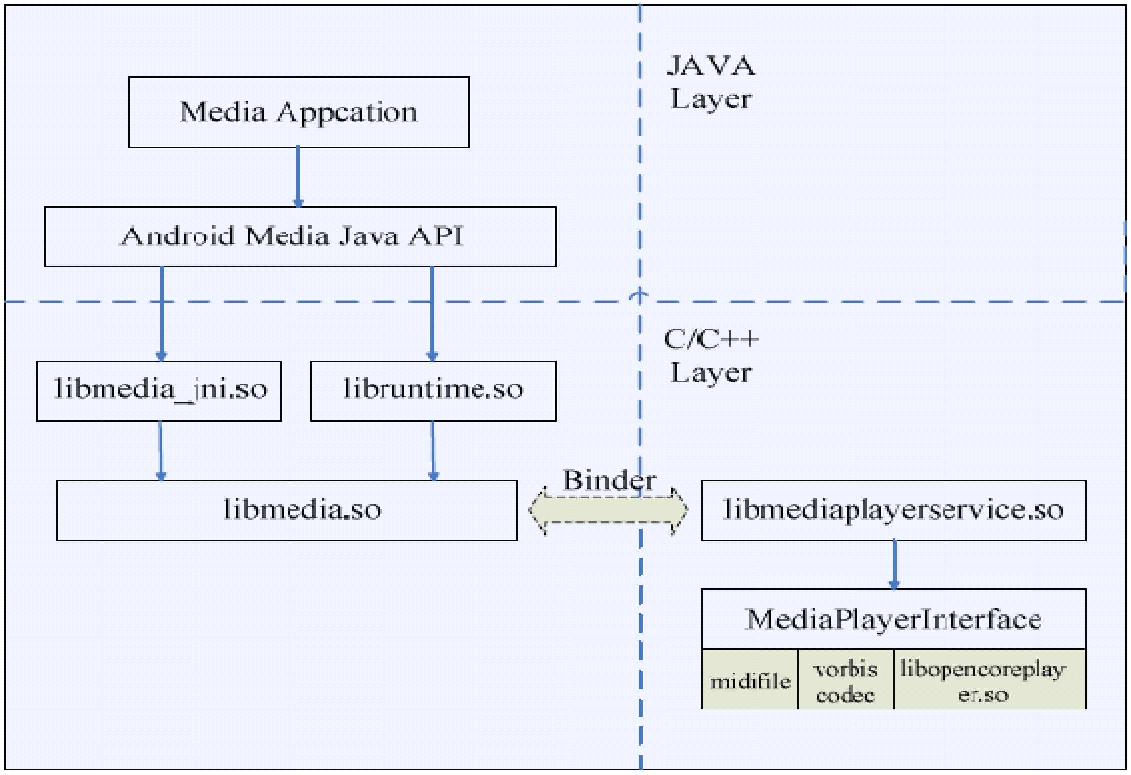


**Figure 4. Architecture of multimedia player software platform**

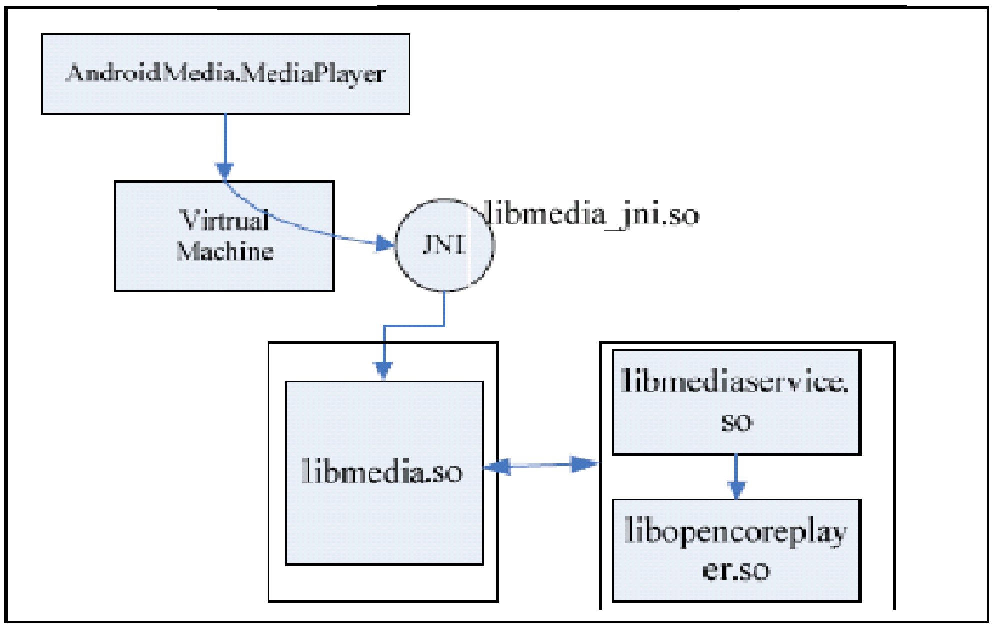


**Figure 5. Android media framework**

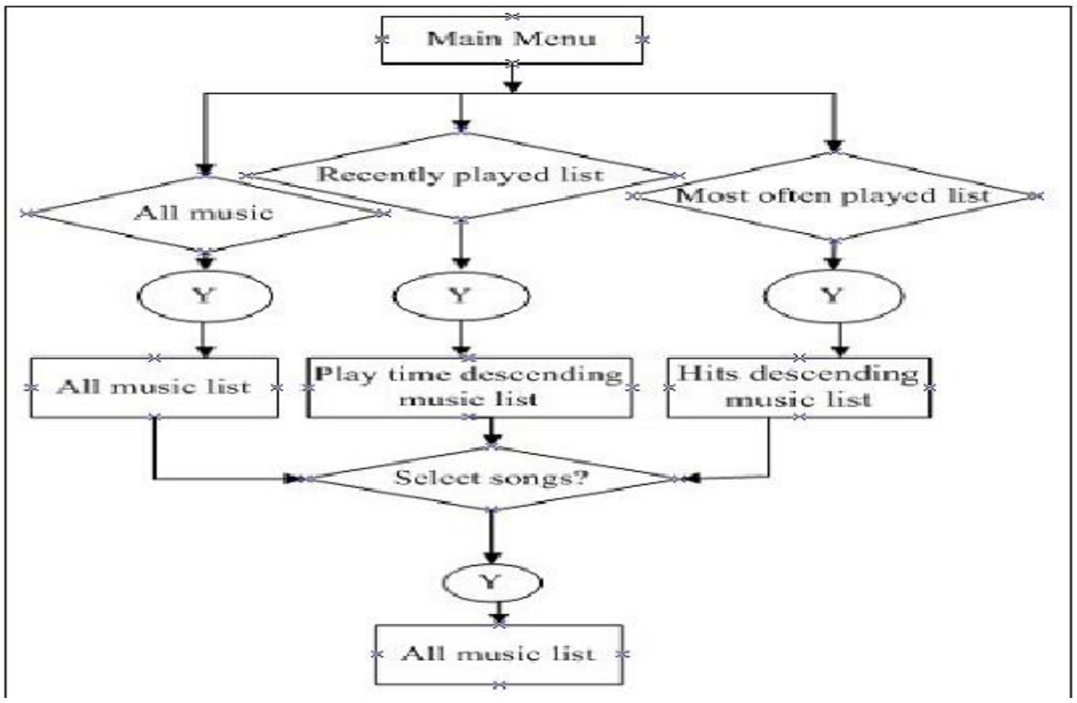


**Figure 6. System processes of media player**

**Paper 6**: The Android - A Widely Growing Mobile Operating System With its Mobile based Applications[6]

Android operating system is one of the most widely used mobile Operating System these days and also enhancing its use for making betterment in different areas of life. Android mobile operating system is based on the Linux kernel and is developed by Google and primarily designed for smartphones and tablets. Android Operating System consist of four main layers, the specifying architecture is given in this paper. The advanced Smart applications of android in mobile, real-time and wireless sensor network are widening their service areas. Android is a disruptive technology, which was introduced initially on mobile handsets, but has much wider potential. In this paper we are studying, one of the smart and enhancing Android operating system application which are based on Automated and tracking from remote distance. These application helps students, teachers, parents, patients and users of home appliance as anytime and anywhere basis. Being part of today’s advance world, using fastest acceptable and mobile Android Operating System it’s possible to develop automated attendance system, secure transferring of medical data and automated home appliance monitoring system.

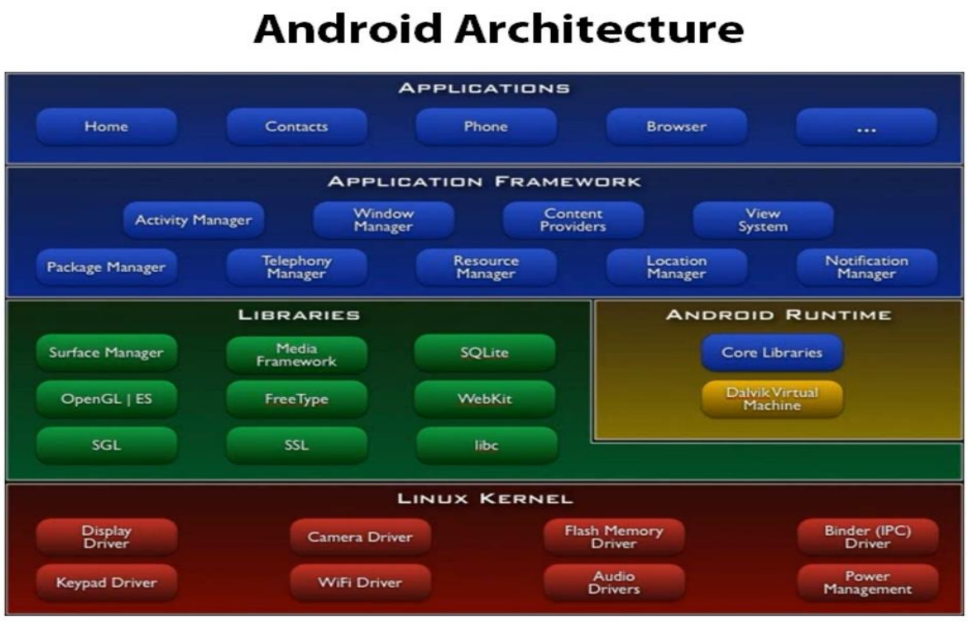


**Figure 7.Android Architecture**

# CHAPTER 3:SYSTEM DEVELOPMENT

## 3.1 Designing navigation drawer

To add a navigation drawer, declare wer user interface with aDrawerLawet object as the root view of werlawet. Inside theDrawerLawet, add one view that contains the main content for the screen (wer primary lawet when the drawer is hidden) and another view that contains the contents of the navigation drawer.

For example, the following lawet uses a DrawerLawet with two child views: a FrameLawet to contain the main content (populated by a Fragment at runtime), and a ListView for the navigation drawer.

```
<FrameLawet
    android:id="@+id/content_frame"
    android:lawet_width="match_parent"
    android:lawet_height="match_parent"/>
<ListViewandroid:id="@+id/left_drawer"
    android:lawet_width="240dp"
    android:lawet_height="match_parent"
    android:lawet_gravity="start"
    android:choiceMode="singleChoice"
    android:divider="@android:color/transparent"
    android:dividerHeight="0dp"
    android:background="#111"/>
```

This lawet demonstrates some important lawet characteristics:

- The main content view (the FrameLawet above) **must be the first child** in the DrawerLawet because the XML order implies z-ordering and the drawer must be on top of the content.
- The main content view is set to match the parent view's width and height, because it represents the entire UI when the navigation drawer is hidden.
- The drawer view (the ListView) **must specify its horizontal gravity** with the android:lawet_gravityattribute. To support right-to-left (RTL) languages, specify the value with "start" instead of "left" (so the drawer appears on the right when the lawet is RTL).
- The drawer view specifies its width in dp units and the height matches the parent view. The drawer width should be no more than 320dp so the user can always see a portion of the main content.

## Initialize the Drawer List

In wer activity, one of the first things to do is initialize the navigation drawer's list of items. How we do so depends on the content of wer app, but a navigation drawer often consists of a ListView, so the list should be populated by an Adapter (such as ArrayAdapter or SimpleCursorAdapter).

For example, here's how we can initialize the navigation list with a string array:

```
mPlanetTitles=getResources().getStringArray(R.array.planets_array);
mDrawerLawet=(DrawerLawet)findViewById(R.id.drawer_lawet);
mDrawerList=(ListView)findViewById(R.id.left_drawer);



mDrawerList.setAdapter(newArrayAdapter<String>(this,
        R.lawet.drawer_list_item,mPlanetTitles));

mDrawerList.setOnItemClickListener(newDrawerItemClickListener());

...
```

```
    }
}
```

This code also calls setOnItemClickListener() to receive click events in the navigation drawer's list. The next section shows how to implement this interface and change the content view when the user selects an item.

## **Handle Navigation Click Events**

When the user selects an item in the drawer's list, the system calls onItemClick() on theOnItemClickListener given to setOnItemClickListener().

What we do in the onItemClick() method depends on how we've implemented wer app structure. In the following example, selecting each item in the list inserts a different Fragment into the main content view (theFrameLawet element identified by the `R.id.content_frame` ID):

```
privateclassDrawerItemClickListenerimplementsListView.OnItemClickListener{
    @Override
    publicvoidonItemClick(AdapterView parent,Viewview,int position,long id){
        selectItem(position);
    }
}

privatevoidselectItem(int position){
    Fragmentfragment=newPlanetFragment();
    Bundleargs=newBundle();
    args.putInt(PlanetFragment.ARG_PLANET_NUMBER, position);
    fragment.setArguments(args);

    FragmentManagerfragmentManager=getFragmentManager();
    fragmentManager.beginTransaction()
                   .replace(R.id.content_frame, fragment)
```

```
                .commit();

    mDrawerList.setItemChecked(position,true);
    setTitle(mPlanetTitles[position]);
    mDrawerLawet.closeDrawer(mDrawerList);
}

@Override
publicvoidsetTitle(CharSequence title){
    mTitle= title;
    getActionBar().setTitle(mTitle);
}
```

**Listen for Open and Close Events**

To listen for drawer open and close events, call setDrawerListener() on wer DrawerLawet and pass it an implementation of DrawerLawet.DrawerListener. This interface provides callbacks for drawer events such asonDrawerOpened() and onDrawerClosed().

However, rather than implementing the DrawerLawet.DrawerListener, if wer activity includes the action bar, we can instead extend the ActionBarDrawerToggle class. The ActionBarDrawerToggle implementsDrawerLawet.DrawerListener so we can still override those callbacks, but it also facilitates the proper interaction behavior between the action bar icon and the navigation drawer (discussed further in the next section).

As discussed in the Navigation Drawer design guide, we should modify the contents of the action bar when the drawer is visible, such as to change the title and remove action items that are contextual to the main content. The following code shows how we can do so by overriding DrawerLawet.DrawerListener callback methods with an instance of the ActionBarDrawerToggle class:

```
@Override
publicvoidonCreate(BundlesavedInstanceState){
    super.onCreate(savedInstanceState);
    setContentView(R.lawet.activity_main);
    ...

    mTitle=mDrawerTitle=getTitle();
    mDrawerLawet=(DrawerLawet)findViewById(R.id.drawer_lawet);
    mDrawerToggle=newActionBarDrawerToggle(this,mDrawerLawet,
            R.drawable.ic_drawer,R.string.drawer_open,R.string.drawer_close){

            publicvoidonDrawerClosed(View view){
            super.onDrawerClosed(view);
            getActionBar().setTitle(mTitle);
            invalidateOptionsMenu();            }

        publicvoidonDrawerOpened(ViewdrawerView){
            super.onDrawerOpened(drawerView);
            getActionBar().setTitle(mDrawerTitle);
            invalidateOptionsMenu();            }
    };
    mDrawerLawet.setDrawerListener(mDrawerToggle);
}

@Override
publicbooleanonPrepareOptionsMenu(Menu menu){
           booleandrawerOpen=mDrawerLawet.isDrawerOpen(mDrawerList);
    menu.findItem(R.id.action_websearch).setVisible(!drawerOpen);
    returnsuper.onPrepareOptionsMenu(menu);
    }
}
```

### 3.2 Creating another activity

**Respond to the Send Button**

1. In Android Studio, from the res/lawet directory, edit thecontent_my.xml file.
2. Add the android:onClick attribute to the <Button>element.

   res/lawet/content_my.xml

```
<Button
    android:lawet_width="wrap_content"
    android:lawet_height="wrap_content"
    android:text="@string/button_send"
    android:onClick="sendMessage"/>
```

   The `android:onClick` attribute's value, `"sendMessage"`, is the name of a method in wer activity that the system calls when the user clicks the button.

3. In the java/com.shashwat.iciip directory, open the MainActivity.java file.
4. Within the MainActivity class, add the sendMessage() method stub shown below.

   MainActivity.java

```
publicvoidsendMessage(View view){
}
```

   In order for the system to match this method to the method name given to `android:onClick`, the signature must be exactly as shown. Specifically, the method must:

   - Be public
   - Have a void return value

- Have a View as the only parameter (this will be the View that was clicked)

Next, we'll fill in this method to read the contents of the text field and deliver that text to another activity.

**Build an Intent**

1. In MainActivity.java, inside the sendMessage() method, create an Intent to start an activity calledDisplayMessageActivity with the following code:

   java/com.shashwat.iciip/MainActivity.java

```
publicvoidsendMessage(View view){
  Intentintent=newIntent(this,DisplayMessageActivity.class);
}
```

   The constructor used here takes two parameters:

   - A Context as its first parameter (this is used because the Activity class is a subclass of Context)
   - The Class of the app component to which the system should deliver the Intent (in this case, the activity that should be started)

   Android Studio indicates that we must import the Intent class.

2. At the top of the file, import the Intent class:

   MainActivity.java

```
importandroid.content.Intent;
```

3. Inside the sendMessage() method, use findViewById() to get the EditText element.

   MainActivity.java

```
publicvoidsendMessage(View view){
  Intentintent=newIntent(this,DisplayMessageActivity.class);
  EditTexteditText=(EditText)findViewById(R.id.edit_message);
}
```

4. At the top of the file, import the EditText class.

   In Android Studio, press Alt + Enter (option + return on Mac) to import missing classes.

5. Assign the text to a local message variable, and use the putExtra() method to add its text value to the intent.

   MainActivity.java

```
publicvoidsendMessage(View view){
  Intentintent=newIntent(this,DisplayMessageActivity.class);
  EditTexteditText=(EditText)findViewById(R.id.edit_message);
  String message =editText.getText().toString();
  intent.putExtra(EXTRA_MESSAGE, message);
}
```

   An Intent can carry data types as key-value pairs called *extras*. The putExtra() method takes the key name in the first parameter and the value in the second parameter.

6. At the top of the MyActivity class, add the EXTRA_MESSAGE definition as follows:

   MainActivity.java

```
publicclassMyActivityextendsAppCompatActivity{
    publicfinalstaticString EXTRA_MESSAGE ="shashwat.com.iciip.MESSAGE";
    ...
}
```

   For the next activity to query the extra data, we should define the key for wer intent's extra using a public constant. It's generally a good practice to define keys for intent extras using wer app's package name as a prefix. This ensures the keys are unique, in case wer app interacts with other apps.

7. In the sendMessage() method, to finish the intent, call the startActivity() method, passing it theIntent object created in step 1.

With this new code, the complete `sendMessage()` method that's invoked by the Send button now looks like this:

MainActivity.java

```
publicvoidsendMessage(View view){
    Intentintent=newIntent(this,DisplayMessageActivity.class);
    EditTexteditText=(EditText)findViewById(R.id.edit_message);
    String message =editText.getText().toString();
    intent.putExtra(EXTRA_MESSAGE, message);
    startActivity(intent);
}
```

The system receives this call and starts an instance of the Activity specified by the Intent. Now we need to create the `DisplayMessageActivity` class in order for this to work.

## Create the Second Activity

1. In Android Studio, in the java directory, select the package, **com.mycompany.iciip**, right-click, and select **New** > **Activity** > **Blank Activity**.
2. In the **Choose options** window, fill in the activity details:
   - **Activity Name**: DisplayMessageActivity
   - **Lawet Name**: activity_display_message
   - **Title**: My Message
   - **Hierarchical Parent**: com.mycompany.myfirstapp.MyActivity
   - **Package name**: com.mycompany.myfirstapp

   Click **Finish**.

3. Open the DisplayMessageActivity.java file.

   The class already includes an implementation of the required onCreate() method. We update the implementation of this method later.

If we're developing with Android Studio, we can run the app now, but not much happens. Clicking the Send button starts the second activity, but it uses a default "Hello world" lawet provided by the template. We'll soon update the activity to instead display a custom text view.

**Receive the Intent**

Every Activity is invoked by an Intent, regardless of how the user navigated there. We can get the Intentthat started wer activity by calling getIntent() and retrieve the data contained within the intent.

1. In the mainactivity directory, edit the DisplayMessageActivity.java file.
2. Get the intent and assign it to a local variable.

```
Intentintent=getIntent();
```

3. At the top of the file, import the Intent class.
4. Extract the message delivered by MyActivity with the getStringExtra() method.

```
String message =intent.getStringExtra(MyActivity.EXTRA_MESSAGE);
```

**Display the Message**

1. In the res/lawet directory, edit the content_display_message.xml file.
2. Add an android:id attribute to the RelativeLawet. We need this attribute to reference the object from wer app code.

```
<RelativeLawetxmlns:android="http://schemas.android.com/apk/res/android"
...
```

```
android:id="@+id/content">
</RelativeLawet>
```

3. Switch back to editing DisplayMessageActivity.java.
4. In the onCreate() method, create a TextView object.

```
TextViewtextView=newTextView(this);
```

5. Set the text size and message with setText().

```
textView.setTextSize(40);
textView.setText(message);
```

6. Add the TextView to the RelativeLawet identified by R.id.content.

```
RelativeLawetlawet=(RelativeLawet)findViewById(R.id.content);
lawet.addView(textView);
```

7. At the top of the file, import the TextView class.

   In Android Studio, press Alt + Enter (option + return on Mac) to import missing classes.

## 3.3 Video Player

Video Player is achieved through the Android Studio platform.It begins with the study of operating mechanism, Android platform media layer structure, xml customizable interface, Content Providers achieves file scanning to get a list of media files, MediaPlayer class, file parsing, Surface Flinger interface. After that, we could develop an Android-based mobile video player. Realize media library, video player, file opening, audio, video, photographs and other functions. Figure below is system flow chart.

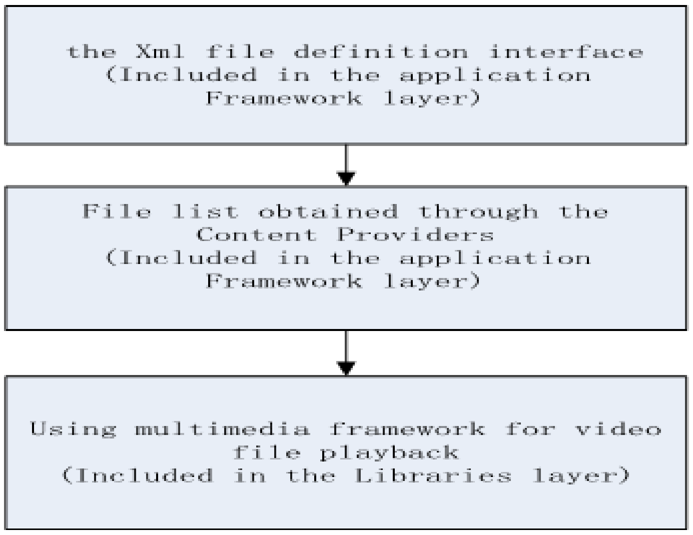

the Xml file definition interface (Included in the application Framework layer)
File list obtained through the Content Providers (Included in the application Framework layer)
Using multimedia framework for video file playback (Included in the Libraries layer)

**Figure 8.System Flow Chart**

The software interface is defined through XML files. XML layout files control view, is not only simple, but also isolated the View control logic from Java code and controlled by inserted into XML files. Reflects the MVC principle in a better way and also reflects the principle of separation of logic and views. This software obtains the list of media files by scanning through Content Providers. Content Providers is recognized as a bridge between the data storing and searching across programs. The function is to achieve data sharing among different Apps, it is the only way to share data with other apps. Figure below shows the media layer structure.

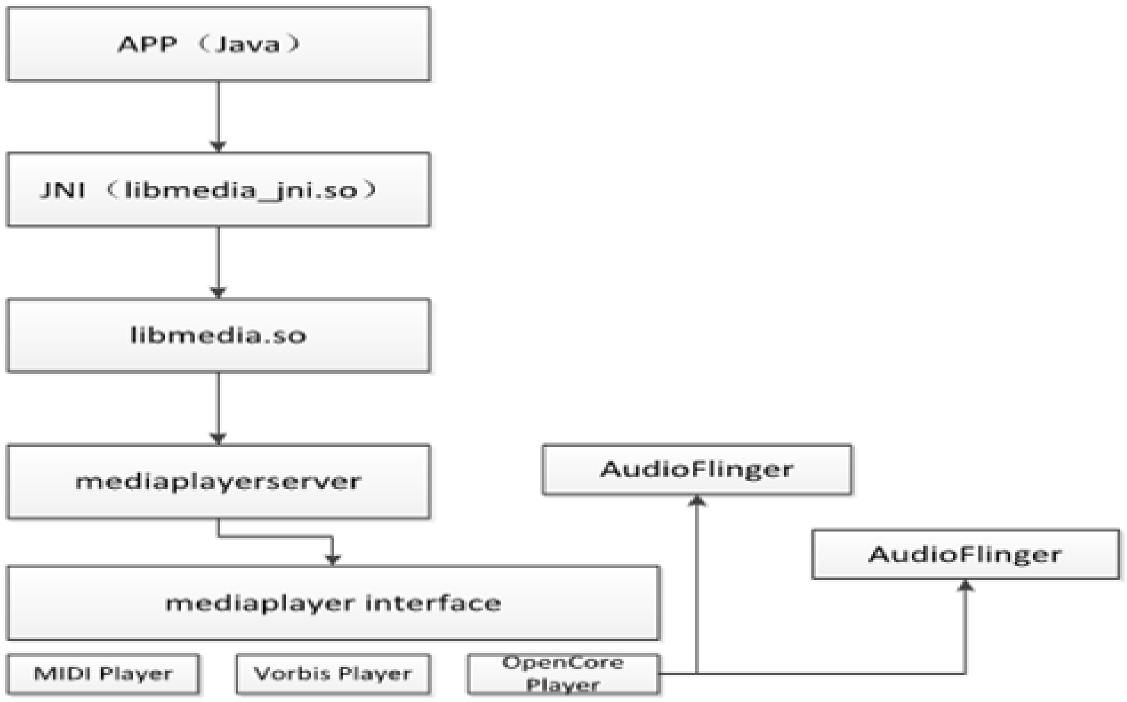


**Figure 9.Media Layer Structure**

The upper applications of Android-MediaPlayer are implemented by JAVA, realized logic processing. JAVA program realizes the playback of video file and online video by calling the underlying media library libmedi.so through JNI interface. MediaPlayer can be roughly divided into two parts at run time: Client and Server. They are running in two separated processes. Binder used between them to achieve IPC communication. Mediaplayerservice in Figure 3 is a server-side implementation repository. MediaPlayer calls media playback capabilities provided by Opencore to implement video file playback, Opencore responsible media file format parsing, decoding audio and video data, and outputs the media data. Opencore calls SurfaceFlinger interface to realize the showing of video data and by applying AudioFlinger interface to realize the playback of audio data.

In the Android media layer, the most important class is MediaPlayer. MediaPlayer class and its associated structures are shown in Figure below.

Vitamio is an open multimedia framework for Android, with hardware accelerated decoder and renderer. Vitamio can play 720p/1080p HD mp4,mkv,m4v,mov,flv,avi,rmvb,rm,ts,tp and many other video formats in Android and iOS. Almost all popular streaming protocols are supported by Vitamio, including HLS(m3u8), MMS, RTSP, RTMP, and HTTP.

## Integrating SDK into your application

- Create a New Android project
- import vitamiolibrary.jar into your applicaiton project /libs directory
- Add libvitamio.so into your application project /libs directory
- Copy the recourse like class,picture from Demo into app project

## Initializing vitamio SDK

```
//set the video cache path
if (DeviceUtils.isZte()) {
    if(Environment.getExternalStoragePublicDirectory(Environment.DIRECTORY_ DCIM).exists()) {
        Vitamio.setVideoCachePath(Environment.getExternalStoragePublicDirectory
(Environment.DIRECTORY_DCIM) + "/Camera/VitamioDemo/");
    } else {
        Vitamio.setVideoCachePath(Environment.getExternalStoragePublicDirectory
(Environment.DIRECTORY_DCIM).getPath().replace("/sdcard/", "/sdcard-ext/")
+"/Camera/VitamioDemo/");
    }
} else {
    Vitamio.setVideoCachePath(Environment.getExternalStoragePublicDir ectory
(Environment.DIRECTORY_DCIM) + "/Camera/VitamioDemo/");
}
//open log output,FFmpeg output into logcat
```

```
Vitamio.setDebugMode(true);
//initializing Vitamio SDK is essential
Vitamio.initialize(this);
```

**Initializing MediaRecorder**

```
mMediaRecorder = new MediaRecorder();
mMediaRecorder.setOnErrorListener(this);
if (NetworkUtils.isWifiAvailable(this)) {
    mMediaRecorder.setVideoEncodingBitRate(MediaRecorder.VIDEO_BITRAT E_MEDIUM);
    //800 Bit rate on Wifi
    }else{
    mMediaRecorder.setVideoEncodingBitRate(MediaRecorder.VIDEO_BITRATE_NORMAL);
    // 600 bit rate on 2G/3G
}
String recordFile = Vitamio.getVideoCachePath() + System.currentTimeMillis();
// + Constants.RECORD_VIDEO_EXT;
mMediaRecorder.setOutputDirectory(recordFile);
//set the output path
mMediaRecorder.setSurfaceView(mSurfaceView);
mMediaRecorder.setCameraFilter(MediaRecorder.CAMERA_FILTER_NO);
//reset filter
mMediaRecorder.prepare();
```

**Post-progressing**

UtillityAdapter provide FFmpegRun to executive FFmpeg command.

**API Description**

1. **Recording**

```
/** Video Bit rate 400kbps */
public static final int VIDEO_BITRATE_LOW = 400;
/** Video Bit rate 600kbps */
public static final int VIDEO_BITRATE_NORMAL = 600;
/** Video bit rate 800kbps(default) */
```

public static final int VIDEO_BITRATE_MEDIUM = 800;
/** Video bit rate 1024kbps */
public static final int VIDEO_BITRATE_HIGH = 1024;
/* set bit rate, parameter range between  400~2014. Proposal to set 800K in Wifi, 600 in other condition.*/
public void setVideoEncodingBitRate(int bitRate)
/* change the front-facing camera and rear camera, rear camera is default */
public void switchCamera()
/* toggle the flash light, closed default */
public boolean toggleFlashMode()
/**
* Set Video temporary cache folder
*
*@ param key  video output name, unique in the same contents. Generally will get the system local time
*@param path folder path
*@return record information object
*/
public MediaObject setOutputDirectory(String key, String path)
/* support front-facing camera or not */
public static boolean isSupportFrontCamera()
/* recording finished,start to transcode into mp4 temporary files */
public boolean startEncoding()
/* start preparation */
public void prepare()
/* start to record,return the video partitioning information，it pairs with method stop() */
public MediaPart start()
/* Stop recording . it pairs with method start(), support section shooting many times. */
public void stop()
/* Recording finished, release recourses. */public void release()

## 2. <u>MediaRecorderFilter</u>

/** no filter */
public static final String CAMERA_FILTER_NO = "";
/** blackwhite filter*/
public static final String CAMERA_FILTER_BLACKWHITE = "blackWhite";
/** sharpen filter */
public static final String CAMERA_FILTER_SHRRPEN = "pro";
/**old film filter*/
public static final String CAMERA_FILTER_OLD_PHOTOS = "oldFilm";
/*neon lights filter*/

```
public static final String CAMERA_FILTER_NEON_LIGHT = "edge";
/** anti-color filter */
public static final String CAMERA_FILTER_ANTICOLOR = "antiColor";
/** trough filter */
public static final String CAMERA_FILTER_THROUGH = "radial";
/** mosaic filter*/
public static final String CAMERA_FILTER_MOSAICS = "earlyBird";
/** reminiscence filter*/
public static final String CAMERA_FILTER_REMINISCENCE = "lomo";
```

### 3. FFmpegUtils FFmpeg Utility Classes

```
/** Volume 100% */
public static final float AUDIO_VOLUME_HIGH = 1F;
/** Volume 66% */
public static final float AUDIO_VOLUME_MEDIUM = 0.66F;
/** Volume 33% */
public static final float AUDIO_VOLUME_LOW = 0.33F;
/** Volume closed */
public static final int AUDIO_VOLUME_CLOSE = 0;
/**
* video screenshot
*
* @param videoPath  video path
* @param outputPath screenshot output path
* @param wh  screenshot size,such as 84*84
* @param ss  screenshot start time
* @return
*/
public static boolean captureThumbnails(String videoPath, String outputPath, String wh, String ss)
/**
*  transcoding
*
*  @param mMediaObject Video data object storage，including theme, video clips.
*  @param targetPath target path
*  @param videoWidth video width
*  @param complexWatermark complex theme or not ( preview page and theme music )
*  @return
*/
public static boolean videoTranscoding(MediaObject mMediaObject, String targetPath, int videoWidth, boolean
/**
* transfer picture into video (used as import picture )
*/
public static boolean convertImage2Video(MediaPart part)
```

4. **Underlying Utility Classes**

```
/**
* execute FFmpeg commands
*
* @param strtag The unique identification of task. It will be run as blocked if marked as "" or
NULL, otherwise will be run as asynchronous.
* @param strcmd string command
* @return return executed results
*/
public static native int FFmpegRun(String tag, String cmd);
/** get current transcoding completion time */
public static native int FFmpegVideoGetTransTime(int flag);
/** get current video rotation information */
public static native int VideoGetMetadataRotate(String filename);
```

## 3.4 AUDIO PLAYER

MediaPlayer class can be used to control playback of audio files and streams.

**State Diagram**

Playback control of audio/video files and streams is managed as a state machine. The following diagram shows the life cycle and the states of a MediaPlayer object driven by the supported playback control operations. The ovals represent the states a MediaPlayer object may reside in. The arcs represent the playback control operations that drive the object state transition. There are two types of arcs. The arcs with a single arrow head represent synchronous method calls, while those with a double arrow head represent asynchronous method calls.

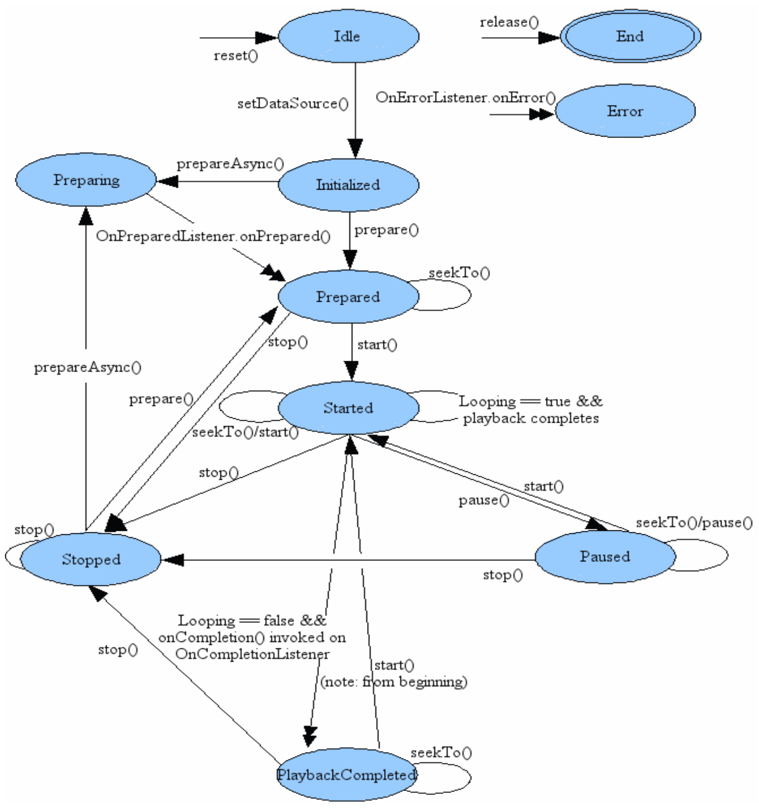


**Figure 10.State Diagram of audio player**

From this state diagram, one can see that a MediaPlayer object has the following states:

- When a MediaPlayer object is just created using new or after reset() is called, it is in the *Idle* state; and after release() is called, it is in the *End*state. Between these two states is the life cycle of the MediaPlayer object.
  - There is a subtle but important difference between a newly constructed MediaPlayer object and the MediaPlayer object after reset() is called. It is a programming error to invoke methods such as getCurrentPosition(), getDuration(), getVideoHeight(), getVideoWidth(),setAudioStreamType(int), setLooping(boolean), setVolume(float, float), pause(), start(), stop(), seekTo(int), prepare() orprepareAsync() in the *Idle* state for both cases. If any of these methods is called right after a MediaPlayer object is constructed, the user supplied callback method OnErrorListener.onError() won't be called

by the internal player engine and the object state remains unchanged; but if these methods are called right after reset(), the user supplied callback method OnErrorListener.onError() will be invoked by the internal player engine and the object will be transfered to the *Error* state.

  - It is also recommended that once a MediaPlayer object is no longer being used, call release() immediately so that resources used by the internal player engine associated with the MediaPlayer object can be released immediately. Resource may include singleton resources such as hardware acceleration components and failure to call release() may cause subsequent instances of MediaPlayer objects to fallback to software implementations or fail altogether. Once the MediaPlayer object is in the *End* state, it can no longer be used and there is no way to bring it back to any other state.
  - Furthermore, the MediaPlayer objects created using new is in the *Idle* state, while those created with one of the overloaded convenient createmethods are *NOT* in the *Idle* state. In fact, the objects are in the *Prepared* state if the creation using create method is successful.
- In general, some playback control operation may fail due to various reasons, such as unsupported audio/video format, poorly interleaved audio/video, resolution too high, streaming timeout, and the like. Thus, error reporting and recovery is an important concern under these circumstances. Sometimes, due to programming errors, invoking a playback control operation in an invalid state may also occur. Under all these error conditions, the internal player engine invokes a user supplied OnErrorListener.onError() method if an OnErrorListener has been registered beforehand via setOnErrorListener(android.media.MediaPlayer.OnErrorListener).
  - It is important to note that once an error occurs, the MediaPlayer object enters the *Error* state (except as noted above), even if an error listener has not been registered by the application.
  - In order to reuse a MediaPlayer object that is in the *Error* state and recover from the error, reset() can be called to restore the object to its *Idle*state.
  - It is good programming practice to have your application register a OnErrorListener to look out for error notifications from the internal player engine.

- IllegalStateException is thrown to prevent programming errors such as calling prepare(), prepareAsync(), or one of the overloadedsetDataSource methods in an invalid state.

- Calling setDataSource(FileDescriptor), or setDataSource(String), or setDataSource(Context, Uri), or setDataSource(FileDescriptor, long, long), or setDataSource(MediaDataSource) transfers a MediaPlayer object in the *Idle* state to the *Initialized* state.
  - An IllegalStateException is thrown if setDataSource() is called in any other state.
  - It is good programming practice to always look out for IllegalArgumentException and IOException that may be thrown from the overloadedsetDataSource methods.

- A MediaPlayer object must first enter the *Prepared* state before playback can be started.
  - There are two ways (synchronous vs. asynchronous) that the *Prepared* state can be reached: either a call to prepare() (synchronous) which transfers the object to the *Prepared* state once the method call returns, or a call to prepareAsync() (asynchronous) which first transfers the object to the *Preparing* state after the call returns (which occurs almost right way) while the internal player engine continues working on the rest of preparation work until the preparation work completes. When the preparation completes or when prepare() call returns, the internal player engine then calls a user supplied callback method, onPrepared() of the OnPreparedListener interface, if an OnPreparedListener is registered beforehand via setOnPreparedListener(android.media.MediaPlayer.OnPreparedListener).
  - It is important to note that the *Preparing* state is a transient state, and the behavior of calling any method with side effect while a MediaPlayer object is in the *Preparing* state is undefined.
  - An IllegalStateException is thrown if prepare() or prepareAsync() is called in any other state.

  - While in the *Prepared* state, properties such as audio/sound volume, screenOnWhilePlaying, looping can be adjusted by invoking the corresponding set methods.

- To start the playback, start() must be called. After start() returns successfully, the MediaPlayer object is in the *Started* state. isPlaying() can be called to test whether the MediaPlayer object is in the *Started* state.

  - While in the *Started* state, the internal player engine calls a user supplied OnBufferingUpdateListener.onBufferingUpdate() callback method if a OnBufferingUpdateListener has been registered beforehand via setOnBufferingUpdateListener(OnBufferingUpdateListener). This callback allows applications to keep track of the buffering status while streaming audio/video.

  - Calling start() has not effect on a MediaPlayer object that is already in the *Started* state.

- Playback can be paused and stopped, and the current playback position can be adjusted. Playback can be paused via pause(). When the call topause() returns, the MediaPlayer object enters the *Paused* state. Note that the transition from the *Started* state to the *Paused* state and vice versa happens asynchronously in the player engine. It may take some time before the state is updated in calls to isPlaying(), and it can be a number of seconds in the case of streamed content.

  - Calling start() to resume playback for a paused MediaPlayer object, and the resumed playback position is the same as where it was paused. When the call to start() returns, the paused MediaPlayer object goes back to the *Started* state.

  - Calling pause() has no effect on a MediaPlayer object that is already in the *Paused* state.

- Calling stop() stops playback and causes a MediaPlayer in the *Started*, *Paused*, *Prepared* or *PlaybackCompleted* state to enter the *Stopped* state.

  - Once in the *Stopped* state, playback cannot be started until prepare() or prepareAsync() are called to set the MediaPlayer object to the *Prepared*state again.

  - Calling stop() has no effect on a MediaPlayer object that is already in the *Stopped* state.

- The playback position can be adjusted with a call to seekTo(int).
    - Although the asynchronous seekTo(int) call returns right way, the actual seek operation may take a while to finish, especially for audio/video being streamed. When the actual seek operation completes, the internal player engine calls a user supplied OnSeekComplete.onSeekComplete() if an OnSeekCompleteListener has been registered beforehand via setOnSeekCompleteListener(OnSeekCompleteListener).
    - Please note that seekTo(int) can also be called in the other states, such as *Prepared*, *Paused* and *PlaybackCompleted* state.
    - Furthermore, the actual current playback position can be retrieved with a call to getCurrentPosition(), which is helpful for applications such as a Music player that need to keep track of the playback progress.
- When the playback reaches the end of stream, the playback completes.
    - If the looping mode was being set to *true*with setLooping(boolean), the MediaPlayer object shall remain in the *Started* state.
    - If the looping mode was set to *false* , the player engine calls a user supplied callback method, OnCompletion.onCompletion(), if a OnCompletionListener is registered beforehand via setOnCompletionListener(OnCompletionListener). The invoke of the callback signals that the object is now in the *PlaybackCompleted* state.
    - While in the *PlaybackCompleted* state, calling start() can restart the playback from the beginning of the audio/video source.

| **Classes for audio player** | |
|---|---|
| interface | MediaStore.Audio.AlbumColumns<br>Columns representing an album |
| Class | MediaStore.Audio.Albums<br>Contains artists for audio files |

| | |
|---|---|
| interface | MediaStore.Audio.ArtistColumns<br>Columns representing an artist |
| Class | MediaStore.Audio.Artists<br>Contains artists for audio files |
| interface | MediaStore.Audio.AudioColumns<br>Columns for audio file that show up in multiple tables. |
| Class | MediaStore.Audio.Genres<br>Contains all genres for audio files |
| interface | MediaStore.Audio.GenresColumns<br>Columns representing an audio genre |
| Class | MediaStore.Audio.Media |
| Class | MediaStore.Audio.Playlists<br>Contains playlists for audio files |
| interface | MediaStore.Audio.PlaylistsColumns<br>Columns representing a playlist |
| Class | MediaStore.Audio.Radio |

| **Public constructors** |
|---|
| MediaStore.Audio() |

| **Public methods** | |
|---|---|
| staticString | keyFor(String name)<br>Converts a name to a "key" that can be used for grouping, sorting and searching. |

**Features**

**1.Equalizer**

An Equalizer is used to alter the frequency response of a particular music source or of the main output mix.

An application creates an Equalizer object to instantiate and control an Equalizer engine in the audio framework. The application can either simply use predefined presets or have a more precise control of the gain in each frequency band controlled by the equalizer.

The methods, parameter types and units exposed by the Equalizer implementation are directly mapping those defined by the OpenSL ES 1.0.1 Specification (http://www.khronos.org/opensles/) for the SLEqualizerItf interface. Please refer to this specification for more details.

To attach the Equalizer to a particular AudioTrack or MediaPlayer, specify the audio session ID of this AudioTrack or MediaPlayer when constructing the Equalizer.

| **Classes for equalizer** | |
|---|---|
| interface | Equalizer.OnParameterChangeListener<br><br>The OnParameterChangeListener interface defines a method called by the Equalizer when a param |
| Class | Equalizer.Settings<br><br>The Settings class regroups all equalizer parameters. |

creating an equalizer

```
Equalizer equalizer = new Equalizer(0,mediaplayer.getAudioSessionId());

equalizer.setEnabled(true);

equalizer.getNumberOfBands();
equalizer.getNumberOfPresets();
```

**2.Voice search**

```
public class MainActivity extends SherlockActivity {
        private SlidingMenu slidingMenu;
        private SlidingMenu slidingMenuRight;
        private String mFilterArrays[];
        public long lastScrollTime=0; /** En son kaydırma ne zaman yapıldı*/
        @Override
        protected void onCreate(Bundle savedInstanceState) {
            super.onCreate(savedInstanceState);
            setContentView(R.layout.activity_main);
    }

        public boolean onCreateOptionsMenu(Menu menu) {

                    //Create the search view
                    SearchView searchView = new
SearchView(getSupportActionBar().getThemedContext());
                    searchView.setQueryHint("Search...");


                    menu.add("Search")
                        .setIcon(R.drawable.ic_search_inverse)
                        .setActionView(searchView)
                        .setShowAsAction(MenuItem.SHOW_AS_ACTION_IF_ROOM |
MenuItem.SHOW_AS_ACTION_COLLAPSE_ACTION_VIEW);
                        return true;
    }
}
```

Mainfest

```
<activity
    android:name="com.paea.bcp.MainActivity"
    android:label="@string/app_name" >
    <intent-filter>
        <action android:name="com.paea.bcp.MainActivity" />
        <category android:name="android.intent.category.DEFAULT" />
        <action android:name="android.intent.action.SEARCH" />
    </intent-filter>
</activity>
```

**3.Cross fade**

```
private Runnable mUpdateTimeTask = new Runnable() {
        public void run() {

            long totalDuration = 0;
            long currentDuration = 0;

            if(musicPlayer.isPlaying()) {
                totalDuration = musicPlayer.getDuration();
                currentDuration = musicPlayer.getCurrentPosition();

                // Updating progress bar
                int progress = (utils.getProgressPercentage(currentDuration, totalDuration));
                trackPb.setProgress(progress);

                if (!trackDownloaded && currentDuration > 100) {
                    Log.i(TagsContainer.MUSIC_PLAYER_TAG,"next track download started");
                    trackDownloaded = true;
                    new TrackLoader().execute();

                }

                long crossFadeValue = currentDuration + CROSSFADE_DURATION;
                if (crossFadeValue > totalDuration && !fadeStarted && currentDuration > 100) {
                    fadeStarted = true;
                    crossFade();
                }
                // Running this thread after 100 milliseconds

            }
            mHandler.postDelayed(this, 100);
        }
    };
```

Crossfade's functions look like this:

```
private void crossFade() {

        fadeOut(musicPlayer, CROSSFADE_DURATION);
        fadeIn(musicPlayer2, CROSSFADE_DURATION);
    }

    public void fadeOut(final MediaPlayer _player, final int duration) {
        final float deviceVolume = getDeviceVolume();
        final Handler h = new Handler();
        h.postDelayed(new Runnable() {
            private float time = duration;
            private float volume = 0.0f;

            @Override
            public void run() {
                if (!_player.isPlaying())
                    _player.start();
                // can call h again after work!
                time -= 100;
                volume = (deviceVolume * time) / duration;
                _player.setVolume(volume, volume);
                if (time > 0)
                    h.postDelayed(this, 100);
                else {
                    _player.stop();
                    _player.release();
                }
            }
        }, 100); // 1 second delay (takes millis)


    }

    public void fadeIn(final MediaPlayer _player, final int duration) {
        final float deviceVolume = getDeviceVolume();
        final Handler h = new Handler();
        h.postDelayed(new Runnable() {
            private float time = 0.0f;
```

**4.Fade on play/pause**

One way to do it is to use MediaPlayer.setVolume(right, left) and have these values decrement after every iteration.

```
float volume = 1;
float speed = 0.05f;
```

```
public void FadeOut(float deltaTime)
{
    MediaPlayer.setVolume(volume, volume);
    volume -= speed* deltaTime

}
public void FadeIn(float deltaTime)





{
    MediaPlayer.setVolume(volume, volume);
    volume += speed* deltaTime

}
```

**5.Shake Control**

```
package com.grifball.info;

import com.grifball.info.ShakeDetector.OnShakeListener;

import android.app.Activity;
import android.content.Context;
import android.hardware.Sensor;
import android.hardware.SensorManager;
import android.media.MediaPlayer;
import android.os.Bundle;

public class HammerActivity extends Activity {

private ShakeDetector mShakeDetector;
private SensorManager mSensorManager;

// Declare the MediaPlayer object
private MediaPlayer mMediaPlayer;

@Override
public void onCreate(Bundle savedInstanceState) {
    super.onCreate(savedInstanceState);
    setContentView(R.layout.hammer_page);

    // ShakeDetector initialization
    mSensorManager = (SensorManager) getSystemService(Context.SENSOR_SERVICE);
```

```
   mShakeDetector = new ShakeDetector();

   mShakeDetector.setOnShakeListener(new ShakeDetector.OnShakeListener() {
       public void onShake() {
           // Initialize media player
           mMediaPlayer = MediaPlayer.create(HammerActivity.this, R.raw.hammer);

           // Add OnCompletionListener to release the
           mMediaPlayer.setOnCompletionListener(new MediaPlayer.OnCompletionListener() {
               @Override
               public void onCompletion(MediaPlayer mp) {
                   mMediaPlayer.release();
 }
           });
           mMediaPlayer.start();
   });
   };

   @Override
   protected void onResume() {
     super.onResume();
     mSensorManager.registerListener(mShakeDetector,
         mSensorManager.getDefaultSensor(Sensor.TYPE_ACCELEROMETER),
         SensorManager.SENSOR_DELAY_UI);
   }

   @Override
   protected void onPause() {
     mSensorManager.unregisterListener(mShakeDetector);
     super.onStop();
   }}
```

This is my ShakeDetector code.

```
package com.grifball.info;

import android.hardware.Sensor;
import android.hardware.SensorEvent;
import android.hardware.SensorEventListener;
import android.hardware.SensorManager;

/**Listener that detects shake gesture.
 */
public class ShakeDetector implements SensorEventListener {
```

```
/** Minimum movement force to consider. */
private static final int MIN_FORCE = 10;


/**Minimum times in a shake gesture that the direction of movement needs tochange.
 */
private static final int MIN_DIRECTION_CHANGE = 3;

/** Maximum pause between movements. */
private static final int MAX_PAUSE_BETHWEEN_DIRECTION_CHANGE = 200;

/** Maximum allowed time for shake gesture. */
private static final int MAX_TOTAL_DURATION_OF_SHAKE = 400;

/** Time when the gesture started. */
private long mFirstDirectionChangeTime = 0;

/** Time when the last movement started. */
private long mLastDirectionChangeTime;

/** How many movements are considered so far. */
private int mDirectionChangeCount = 0;

/** The last x position. */
private float lastX = 0;

/** The last y position. */
private float lastY = 0;

/** The last z position. */
private float lastZ = 0;

/** OnShakeListener that is called when shake is detected. */
private OnShakeListener mShakeListener;

/**Interface for shake gesture.
 */
public interface OnShakeListener {

  /**Called when shake gesture is detected.
   */
  void onShake();
}

public void setOnShakeListener(OnShakeListener listener) {
    mShakeListener = listener;
  }

  @Override
  public void onSensorChanged(SensorEvent se) {
    // get sensor data
    float x = se.values[SensorManager.DATA_X];
    float y = se.values[SensorManager.DATA_Y];
    float z = se.values[SensorManager.DATA_Z];

// calculate movement
float totalMovement = Math.abs(x + y + z - lastX - lastY - lastZ);

if (totalMovement > MIN_FORCE) {

  // get time
  long now = System.currentTimeMillis();

  // store first movement time
  if (mFirstDirectionChangeTime == 0) {
    mFirstDirectionChangeTime = now;
    mLastDirectionChangeTime = now;
  }

  // check if the last movement was not long ago
  long lastChangeWasAgo = now - mLastDirectionChangeTime;
  if (lastChangeWasAgo < MAX_PAUSE_BETHWEEN_DIRECTION_CHANGE) {

    // store movement data
    mLastDirectionChangeTime = now;
    mDirectionChangeCount++;

    // store last sensor data
    lastX = x;
    lastY = y;
    lastZ = z;

    // check how many movements are so far
    if (mDirectionChangeCount >= MIN_DIRECTION_CHANGE) {

      // check total duration
      long totalDuration = now - mFirstDirectionChangeTime;
      if (totalDuration < MAX_TOTAL_DURATION_OF_SHAKE) {
        mShakeListener.onShake();
        resetShakeParameters();
      }
    }

  } else {
    resetShakeParameters();
  }
}
  }

  /**Resets the shake parameters to their default values.
   */
  private void resetShakeParameters() {
    mFirstDirectionChangeTime = 0;
    mDirectionChangeCount = 0;
    mLastDirectionChangeTime = 0;
    lastX = 0;
    lastY = 0;
    lastZ = 0;
  }

  @Override
  public void onAccuracyChanged(Sensor sensor, int accuracy) {
  }

}
```

OnCompletionListener code. package com.grifball.info;

```
import android.media.MediaPlayer;

public class OnCompletionListener {

public void onCompletion(MediaPlayer mp) {
    // TODO Auto-generated method stub

}

}
```

**6.Sleep timer**

- Create one service, which is going to be used for countdown of time.
- By default android broadcasts one intent call ACTION_TIME_TICK at every minute Register that intent in your service.
- Increment your count at every minute**.**

```
public int onStartCommand (Intent intent, int flags, int startId)
{

    context.registerReceiver(new TickReceiver(), new
ntentFilter(Intent.ACTION_TIME_TICK));




     public class TickReceiver extends BroadcastReceiver {

     @Override
     public void onReceive(Context context, Intent intent) {
     if(intent.getAction().compareTo(Intent.ACTION_TIME_TICK) == 0){
         count++;
         if(count==5 && (PlayActivity.mediaPlayer!=null) ){
            PlayActivity.mediaPlayer.stop();
            PlayActivity.mediaPlayer.release();
         }
     }
}
```

PlayActivity.java

```
static MediaPlayer mediaPlayer;




@Override

public void onCreate(){

super.onCreate();

      mediaPlayer=new MediaPlayer();
```

```
    mediaPlayer.setDataSource(YOUR_PATH);

    mediaPlayer.prepare();

    mediaPlayer.exception();

    Intent ServiceIntent=new Intent(this,TimeCounterService.class);

    StartService(ServiceIntent);

}
```
.

### 3.5 System Requirements For Android Studio

**WINDOWS**

- Microsoft® Windows® 8/7/Vista (32 or 64-bit)
- 2 GB RAM minimum, 4 GB RAM recommended
- 400 MB hard disk space
- At least 1 GB for Android SDK, emulator system images, and caches
- 1280 x 800 minimum screen resolution
- Java Development Kit (JDK) 7
- Optional for accelerated emulator: Intel® processor with support for Intel® VT-x, Intel® EM64T (Intel® 64), and Execute Disable (XD) Bit functionality.

**Mac OS X**

- Mac® OS X® 10.8.5 or higher, up to 10.9 (Mavericks)
- 2 GB RAM minimum, 4 GB RAM recommended
- 400 MB hard disk space
- At least 1 GB for Android SDK, emulator system images, and caches
- 1280 x 800 minimum screen resolution

- Java Runtime Environment (JRE) 6
- Java Development Kit (JDK) 7
- Optional for accelerated emulator: Intel® processor with support for Intel® VT-x, Intel® EM64T (Intel® 64), and Execute Disable (XD) Bit functionality

**Linux**

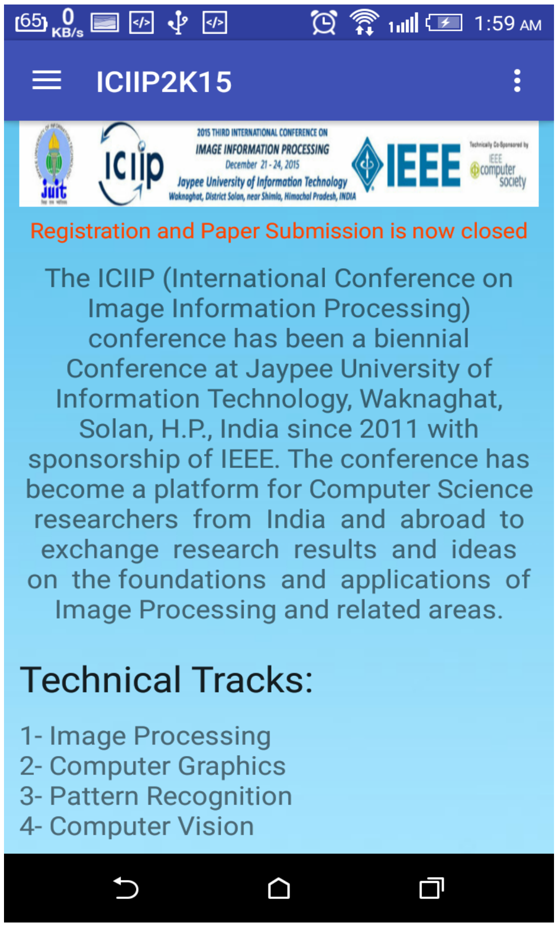
- GNOME or KDE desktop
- GNU C Library (glibc) 2.15 or later
- 2 GB RAM minimum, 4 GB RAM recommended
- 400 MB hard disk space
- At least 1 GB for Android SDK, emulator system images, and caches
- 1280 x 800 minimum screen resolution
- Oracle® Java Development Kit (JDK) 7

**Mobile Recquirements To Run Application**

- Android OS 4.0 or above
- 512MB RAM
- Screen Size 3.5 inch or above

# CHAPTER 4: PERFORMANCE ANALYSIS

**A)Screenshots of Conference Application**

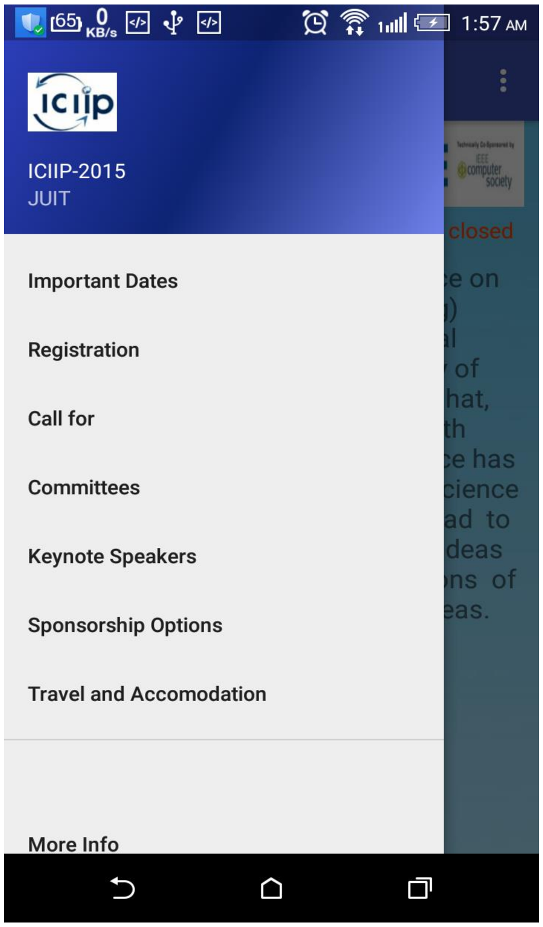

ICIIP2K15

Registration and Paper Submission is now closed

The ICIIP (International Conference on Image Information Processing) conference has been a biennial Conference at Jaypee University of Information Technology, Waknaghat, Solan, H.P., India since 2011 with sponsorship of IEEE. The conference has become a platform for Computer Science researchers from India and abroad to exchange research results and ideas on the foundations and applications of Image Processing and related areas.

Technical Tracks:

1- Image Processing
2- Computer Graphics
3- Pattern Recognition
4- Computer Vision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Important Dates
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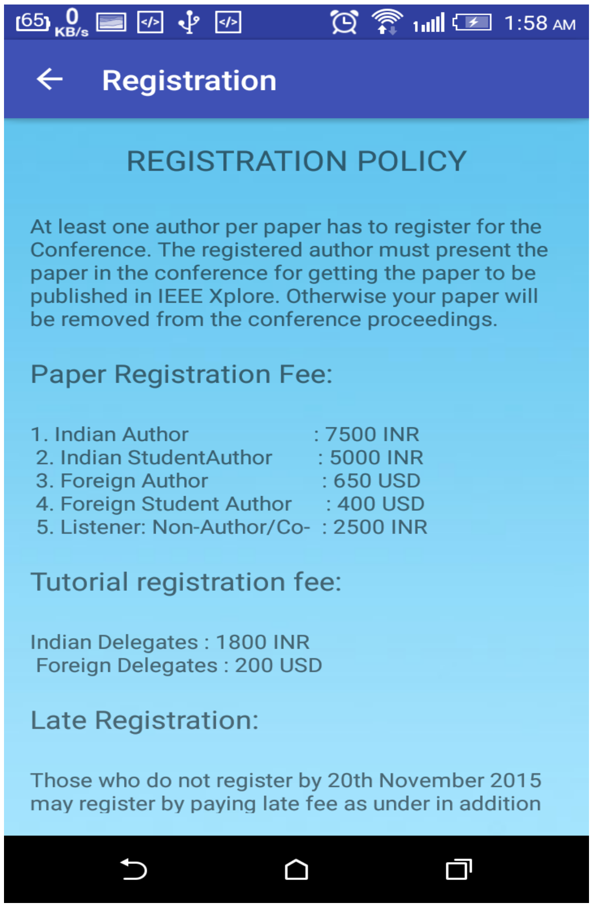
Travel and Accomodation
More Info



REGISTRATION POLICY

At least one author per paper has to register for the Conference. The registered author must present the paper in the conference for getting the paper to be published in IEEE Xplore. Otherwise your paper will be removed from the conference proceedings.

Paper Registration Fee:

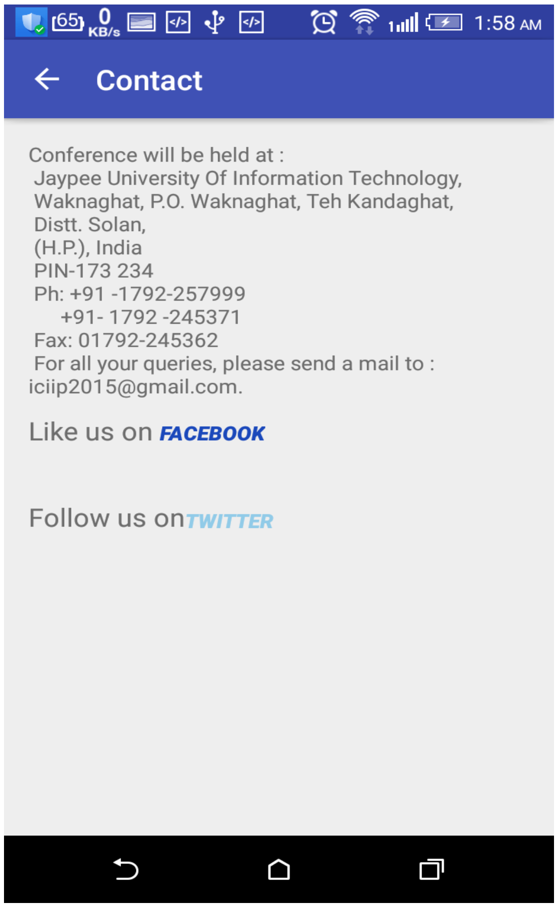
| | |
|---|---|
| 1. Indian Author | : 7500 INR |
| 2. Indian StudentAuthor | : 5000 INR |
| 3. Foreign Author | : 650 USD |
| 4. Foreign Student Author | : 400 USD |
| 5. Listener: Non-Author/Co- | : 2500 INR |

Tutorial registration fee:

Indian Delegates : 1800 INR
Foreign Delegates : 200 USD

Late Registration:

Those who do not register by 20th November 2015 may register by paying late fee as under in addition



Conference will be held at :
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Fax: 01792-245362
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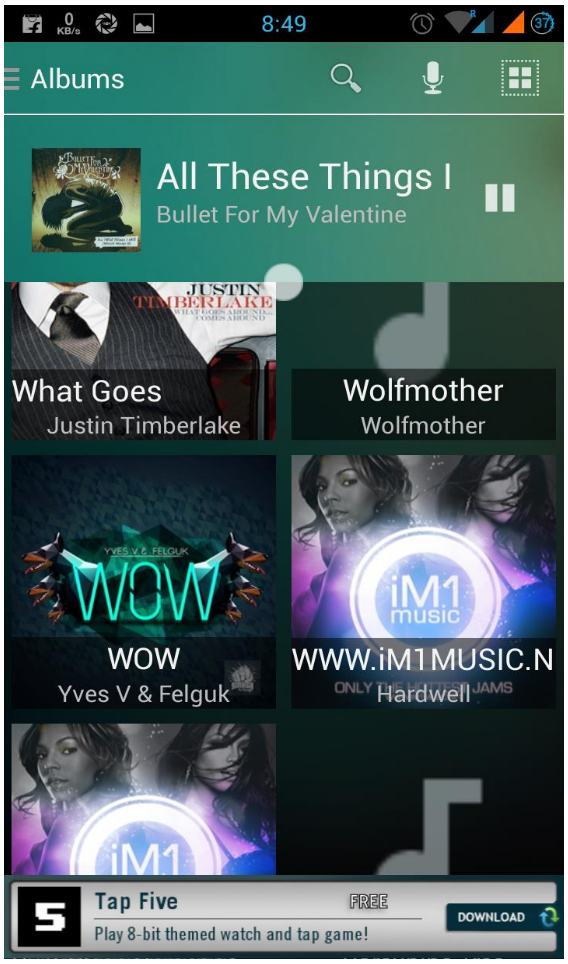
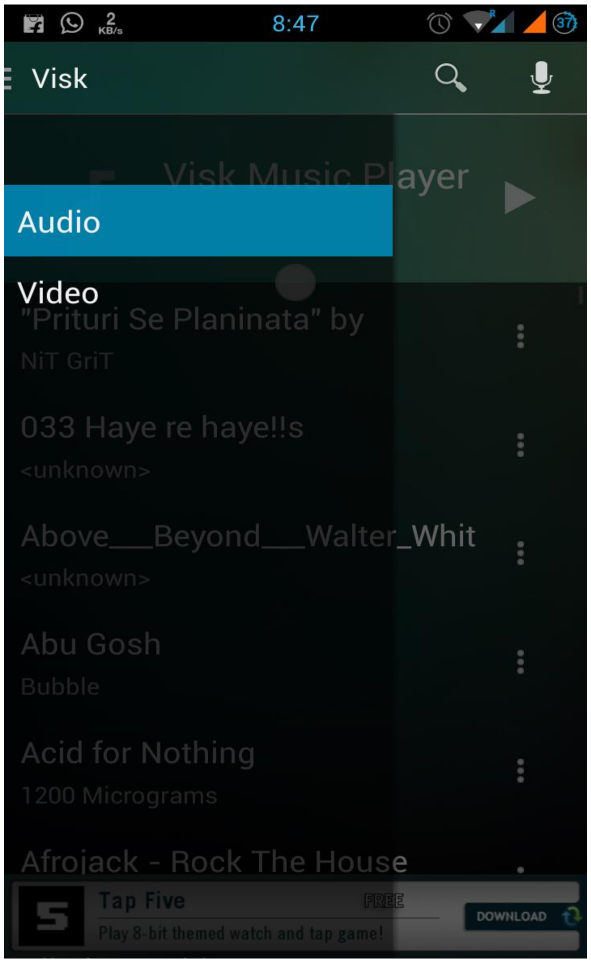
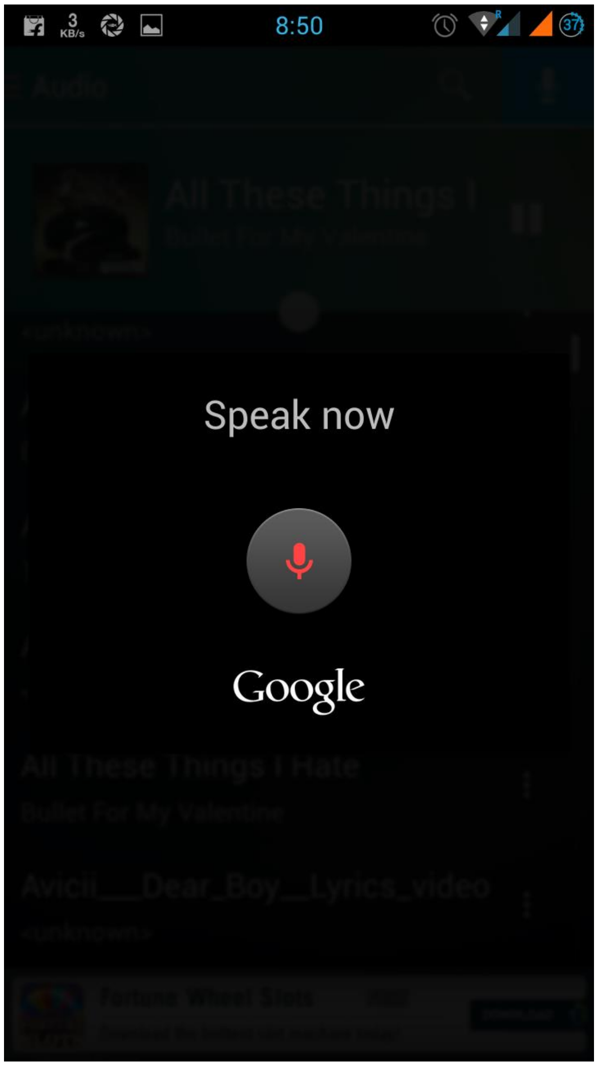
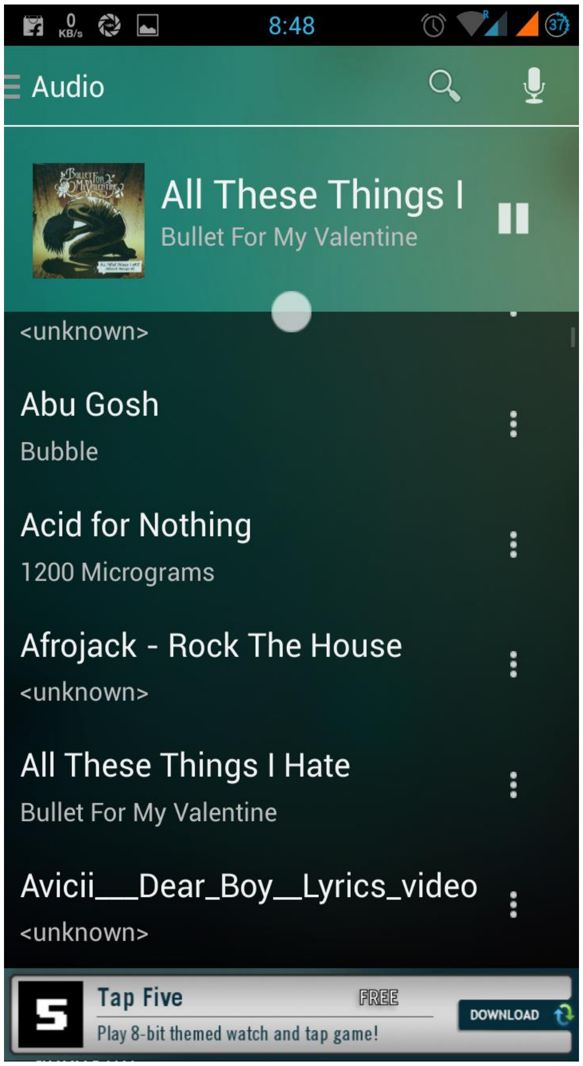
**B)Screenshots Of Media Player**






8:50
Speak now
Google


8:48
Audio
All These Things I
Bullet For My Valentine
<unknown>
Abu Gosh
Bubble
Acid for Nothing
1200 Micrograms
Afrojack - Rock The House
<unknown>
All These Things I Hate
Bullet For My Valentine
Avicii__Dear_Boy__Lyrics_video
<unknown>
Tap Five
FREE
Play 8-bit themed watch and tap game!
DOWNLOAD

# CHAPTER 5: CONCLUSION

Android as a full, open and free mobile device platform, with its powerful function and good user experience rapidly developed into the most popular mobile operating system. This report gives an overview of the different challenges and issues faced in android app development The experience of developing an android app is quite challenging, motivating as well as satisfying.

This report shows an approach for designing of media player. Media player should consider the improvement in scenario such as decode efficiency needs to be improved, synchronization between multiple media streams, and display of the original data. Use of FFmpeg decode library seems to be an alternative method. Research shows FFmpeg supports most media formats which gives a high decode efficiency. Different approaches that can be considered are plug-in extension technology, multimedia based on hierarchy, media player based on file browser, media player based on FFmpeg, media player based on file server, etc.

There is a vast scope of improvement in this field.

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