

## **I-MAP: ANDROID BASED ONLINE AND OFFLINE LOCATION FINDER**

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### **ABSTRACT**

Android is becoming the fastest operating system to be used in the smart devices for which application are developing. This paper will justify the needs and types of map and also the ability to mark the location as the user needs for locating its home, office, car parking and it also provides placing markers to a specific area. The I-map contains feature of multiple marker which can specify multiple areas along with its Longitude and Latitude positions. The variations in the map type can give the user a detailed view about the regions and accordingly user can markup the region with the polygon feature. This technology also works in an offline mode, giving user less chance of Map Jaggies for any particular area. The application uses the Google API key and the encryption method SHA1 key

**KEYWORDS:** Encryption, Google API, Jaggies, SHA1 Key

### **INTRODUCTION**

The mobile has become the valuable part in the recent years for the human beings. It has become necessary for humans to have a powerful device which will provide numerous facilities other than simple facility available in mobile phones. I-map is the Android Application facility, Google supported map that will Search, locate and navigate the location on the map.

Android devices have become the first preference for many users and the demand for social application is growing immensely [1]. So this application is made to satisfy the need of the user while travelling or searching to locate and markup the region. The user can also get directions in Latitudinal and Longitudinal markings on the Map of any region. I-map provides different view like hybrid view and terrain view to provide user an accurate region with names and markings on it. It can mark multiple regions through pinpoint and enclose various selected regions through Polygon selection. The navigational feature gives handler its recent location on the map according to the real time data [2]. The map works smoothly in the offline mode without representing any jaggies in any 'zoom in' or 'zoom out' condition. The swipe function on the map can help the user to swipe easily between different regions and the pinch in function will let the map to 'zoom out', similarly the pinch out function will 'zoom in' the map view. I-map also has the map of the detailed and marked up view of the Centurion Institute Campus as it represents each part of the campus. The smooth, precise and quality features and functions on the map give user a useful technology on their hand to move freely on earth.

### **Overview of Google API**

Google has developed Google APIs using JavaScript APIs that allows interaction with Google Services and Assimilation of multimedia, feed-based Internet content into web applications [7]. Google user scripting language such as AJAX scripting and can be easily loaded using Google Loader. It provides many services to the developers to design various useful applications. Amongst numerous services Google API is a medium or platform for accessing various services provided by Google. Google offers variety of API for developers. The APIs can be used for Google Book Search, Google Analytics, Blogger, Google Code Search, Google Apps, Google Base, Google Spreadsheets, Google Calendar,



- Create New Android Project

Go to File > New > Android Application Project.

Select the Target SDK 4.2 & Min SDK 2.2, compile with Android 4.3



Figure 2

- Now Get an SHA1 Key

SHA1 key is required for we accesses API key from Google API console. How we get SHA1 key Go to Windows > Preference > Android> Build > Copy SHA1 key

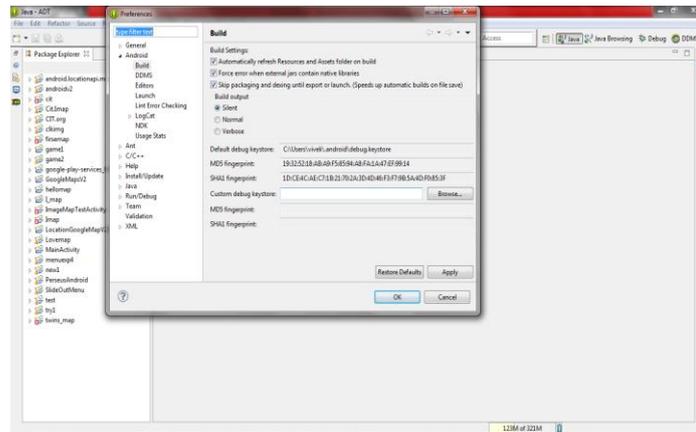


Figure 3

- Import the Google play Services on the workspace

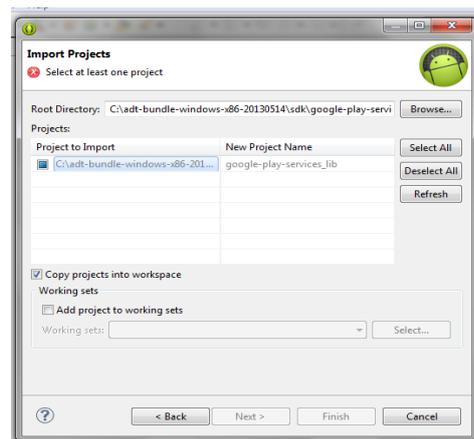


Figure 4

- After creating the new file for android project set the properties of android and imports the Google play service\_lib into the project.

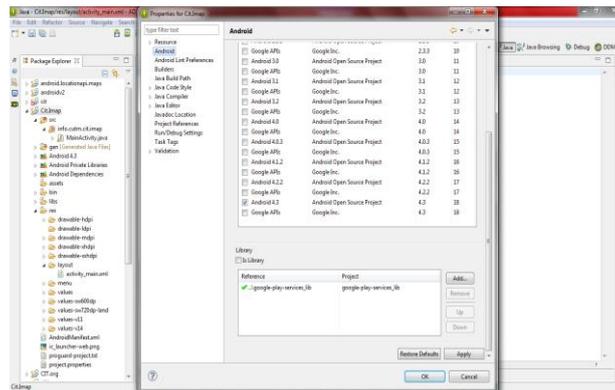


Figure 5

- Get the Android API key

Log in to Google API then name the project and go to Services to get the Android API key value for android map v2, get the SHA1 Key number along with the package name with a semicolon between them.

- In AndroidManifest.xml, the following element is added as a child of the `<application>` element.

```
<meta-data
```

```
  android:name="com.oogle.android.maps.v2.API_KEY"
```

```
  android:value="API_KEY"/>
```

This section sets the key `com.google.android.maps.v2.API_KEY` to the value `API_KEY` and makes the API key visible to any Map Fragment in the application.

- Specify Permissions

Specify the permissions your application needs, by adding `<uses-permission>` elements as children of the `<manifest>` element.

```
<uses-permissionandroid:name="android.permission.INTERNET"/>
```

```
<uses-permissionandroid:name="android.permission.ACCESS_NETWORK_STATE"/>
```

```
<uses-permissionandroid:name="android.permission.WRITE_EXTERNAL_STORAGE"/>
```

```
<uses-permissionandroid:name="com.google.android.providers.gsf.permission.READ_GSERVICES"/>
```

```
  android:name="android.permission.ACCESS_COARSE_LOCATION"/>
```

```
<uses-permission
```

```
  android:name="android.permission.ACCESS_FINE_LOCATION"/>
```

- Specify Requirement for OpenGL ES Version 2

The Google Maps Android API uses OpenGL ES version 2 to render the map. If OpenGL ES version 2 is not present on application map will not appear. Add the following `<uses-feature>` element as a child of the `<manifest>` element in `AndroidManifest.xml`

```

<uses-feature
    android:glEsVersion="0x00020000"
    android:required="true"/>
    
```

- Add a Fragment to support the layout

The XML file that defines the app's layout, and the main activity Java file is added with the fragment.

```

<?xml version="1.0" encoding="utf-8"?>
<fragment xmlns:android="http://schemas.android.com/apk/res/android"
    android:id="@+id/map"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:name="com.google.android.gms.maps.MapFragment"/>
    
```

- For the Polygon Functionality

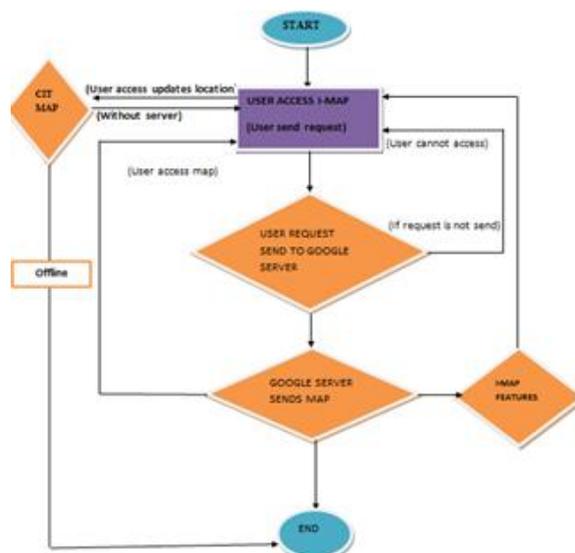
```

polygonOptions.add (marker.getPosition());
polygonOptions.strokeColor (Color.RED);
polygonOptions.fillColor (Color.BLUE);
polygon = myMap.addPolygon (polygonOptions);
    
```

- To setup the Navigational feature for the Map, the following codes is needed while coding GoogleMap.OnMyLocationButtonClickListener.

**Flowchart**

The flowchart explains the detailed working of the application in online and offline mode with respect to its request for data retrieving from the Google server and response made by the server for the acceptance of data by the application.



## Result and Simulation

- Output on AVD (Online Mode)

Parameters -

**Name:** nokia2

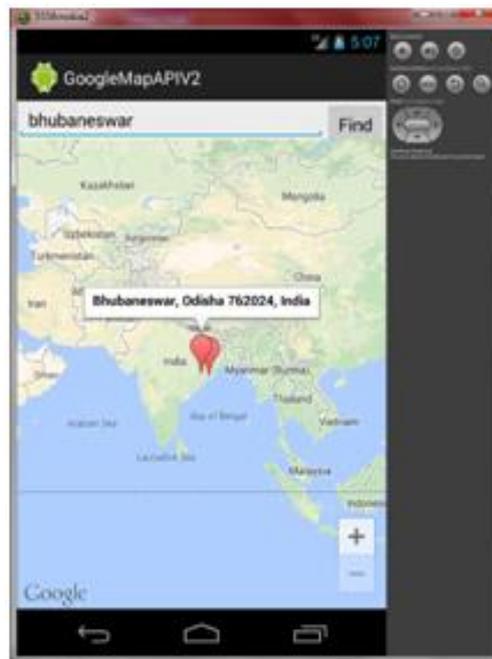
**Target:** Android 4.3(API Level 18)

- The output appears as the splash screen along with the Menus, representing different functions of the I-map after execution.



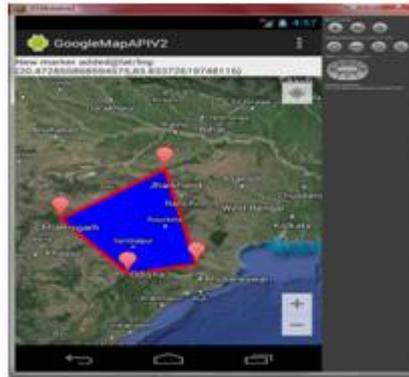
**Figure 6**

- The Main Activity in the Menu will show the output of the search field, through which user can easily locate their interest of areas. The search point will represent the area in the following format: City/State, Capital, Pin Number, and Country.



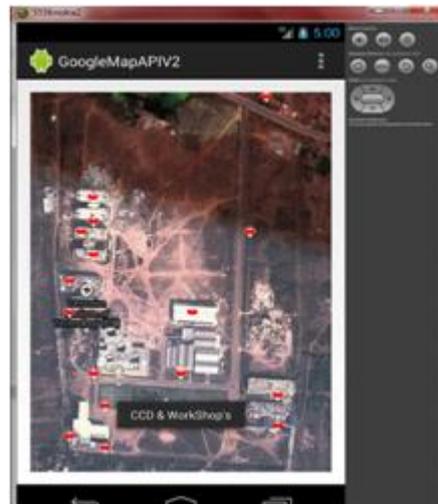
**Figure 7**

- The Second selection on the map naming Map1, will give the output on the emulator consisting of Latitude and Longitude, in the Hybrid map type, along with the Compass. The Pin point view has a multiple markup feature on the map. The Selected region can together show a polygon view to enclose the region of focus.



**Figure 8**

- The below image represents the Third option on the menu which will give the output of the Centurion Institute Campus, Bhubaneswar, Odisha with its detailed marking, representing each location of the campus



**Figure 9**

- The Fourth Menu will display the Developers Detail and about the application.
  - Output on AVD (Offline Mode)

In offline mode of the AVD the application will only show the Map of Centurion Campus with all its details as it works on the offline mode and rest of the parts of the application will not be displayed because the rest parts need Online Connection to view the Map on the AVD emulator.

- Output on the Android Device (Online Mode)

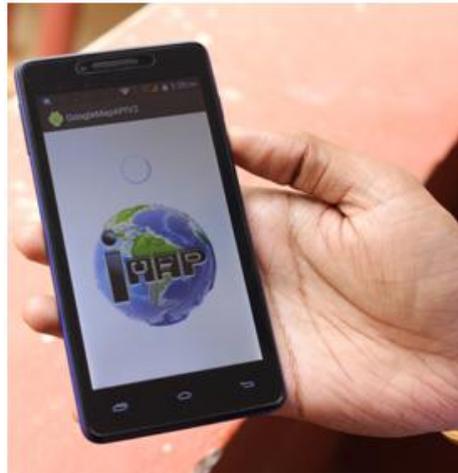
Parameters-

**Name:** Micromax Canvas a76

**Target:** Android 4.2.2

**Kernel Version:** 3.4.5

- Executing the Application on the Device, the Splash screen of the application results like in Figure 10.



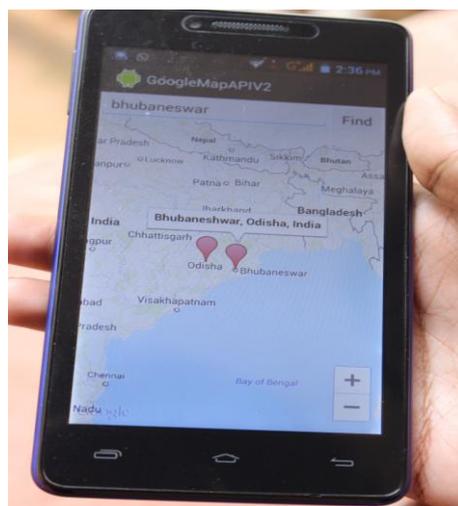
**Figure 10**

- The Menu layout of the Application in the device appears to be as in Figure 11.



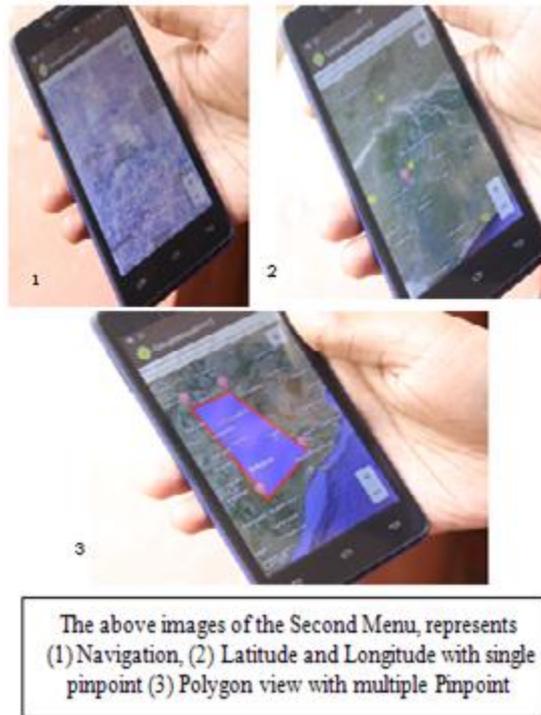
**Figure 11**

- The first option of the Menu naming Main Activity is represented below (Figure 12) in the online mode, which is showing the Terrain map type along with the location which is searched and the location is searched according to City/State, Capital, and Country.



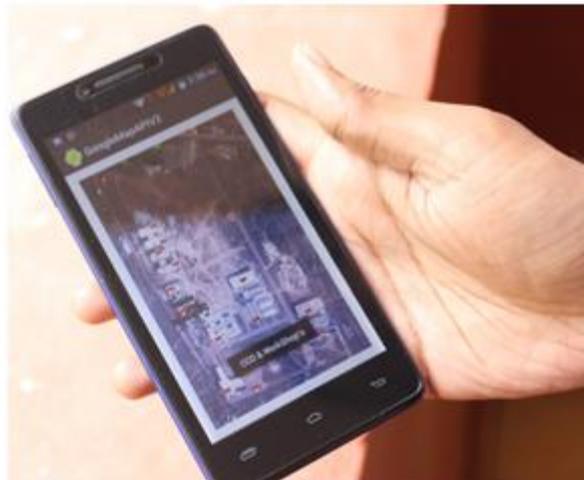
**Figure 12**

- In the Second option of the menu of the I-map, the application will show the map in the Hybrid Map type along with the Navigation, Multiple Pinpoint, Latitude and Longitude and the Polygon Functionality.



**Figure 13**

- The image of Figure 14 represents the Third option of the menu which will give the output of the Centurion University Campus, Bhubaneswar with its detailed marking, representing each location on the campus.

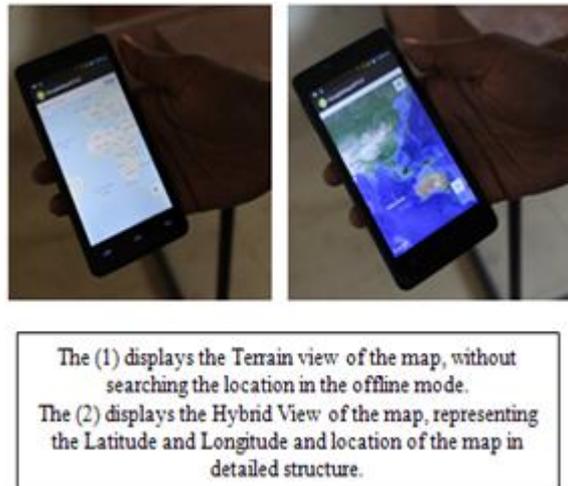


**Figure 14**

- The Fourth Menu will just show the information about the Developers.

#### **Output on the Android Device (Offline Mode)**

- In offline mode the application displays the map by retrieving it from the buffer memory.



**Figure 15**

## CONCLUSIONS

We used the Google API key to construct the map and its various forms and its types to help the public using android devices. Android applications are becoming a great scope for the future purpose in the field of smart devices to Google database connectivity. Similarly, I-map retrieves data form Google database in Online mode and also works offline using the buffer memory of the device. As it consumes less data on the device, it works more swiftly. Moreover the Polygon Feature and the Campus Specification Map extends the application existence and differentiate it from others.

The challenges for the future work of this application may include the feature to track the objects and navigate accordingly, and should work more effectively in the offline mode and at any presence of time.

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