



OpenStreetMap Library

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¿Qué es OpenStreetMap (OSM)?

- Proyecto colaborativo.
- Steve Coast (2004).
- Open Database License.
- Recolección GPS y con imagen satelital.
- Edición de puntos, rutas, áreas, tags, etc.



OpenStreetMap

Ejemplo Múnich Alemania



Librerías de acceso a datos no procesados

| Library ↕ | Platforms ↕ | Target languages ↕ |
|--|--------------------|--------------------|
| osm-common | Android, Java | Java |
| osmapi | Android, Java | Java |
| osmapi | Cross- platform | Python |
| osmaR | Cross- platform | R |
| OSMLib | Cross- platform | Ruby |
| Rosemary | Cross- platform | Ruby |
| Services_OpenStreetMap | Cross- platform | PHP |

Librerías para datos procesados

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Librerías para desplegar mapas interactivos

| Library ↕ | Platforms ↕ | Target languages ↕ |
|--|------------------------------------|--------------------------------|
| BruTile | Cross-platform | Silverlight, C# |
| Cartagen | Web | JavaScript |
| Carto Mobile SDK  | Android, iOS, Windows Phone | Java, Objective-C++, Swift, C# |
| CartoType | Windows, iOS, Android, macOS, Unix | C++, .NET, Java, Objective-C++ |
| COSMCtrl | Windows | C++ |
| GLMap | iOS, Android | Objective-C, Swift, Java |
| Halcyon | Flash | ActionScript |
| osmdroid | Android | Java |



Librerías para navegación

| Library | Platforms | Target languages |
|---|------------------------------------|--------------------------------|
| CartoType | Windows, iOS, Android, macOS, Unix | C++, .NET, Java, Objective-C++ |
| GraphHopper | Cross-platform | Java, Objective-C, Swift |
| libosmscout | Cross-platform | C++, Java |
| Mapbox Android Services  | Android, Java | Java |
| Mapbox GL Directions  | Web | JavaScript |

Hola Mundo en osmdroid

- build.gradle

```
dependencies {  
    compile fileTree(include: ['*.jar'], dir: 'libs')  
    androidTestCompile('com.android.support.test.espresso:espresso-core:2.2.2', {  
        exclude group: 'com.android.support', module: 'support-annotations'  
    })  
    compile 'com.android.support:appcompat-v7:26.+'  
    compile 'com.android.support.constraint:constraint-layout:1.0.2'  
    testCompile 'junit:junit:4.12'  
    compile 'org.osmdroid:osmdroid-android:5.6.5'  
    compile files('libs/slf4j-android-1.5.8.jar')  
}
```

- AndroidManifest.xml

```
<uses-permission android:name="android.permission.ACCESS_COARSE_LOCATION"/>  
<uses-permission android:name="android.permission.ACCESS_FINE_LOCATION"/>  
<uses-permission android:name="android.permission.ACCESS_WIFI_STATE" />  
<uses-permission android:name="android.permission.ACCESS_NETWORK_STATE" />  
<uses-permission android:name="android.permission.INTERNET" />  
<uses-permission android:name="android.permission.WRITE_EXTERNAL_STORAGE" />
```




Hola Mundo en osmdroid

- activity_main.xml

```
<org.osmdroid.views.MapView  
    android:id="@+id/map"  
    android:layout_width="fill_parent"  
    android:layout_height="fill_parent"/>
```

- MainActivity.java

```
mOpenMapView = (MapView) findViewById(R.id.map);  
mOpenMapView.setBuiltInZoomControls(true);  
IMapController myMapController = mOpenMapView.getController();  
myMapController.setZoom(4);  
mOpenMapView.setMultiTouchControls(true);
```



Hola Mundo en osmdroid

- MainActivity.java

```
ArrayList<OverlayItem> points = new ArrayList<OverlayItem>();
points.add(new OverlayItem("US", "US", new GeoPoint(38.883333, -77.016667)));
points.add(new OverlayItem("China", "China", new GeoPoint(39.916667, 116.383333)));
points.add(new OverlayItem("United Kingdom", "United Kingdom", new GeoPoint(51.5, -0.116667)));
points.add(new OverlayItem("Germany", "Germany", new GeoPoint(52.516667, 13.383333)));
points.add(new OverlayItem("Korea", "Korea", new GeoPoint(38.316667, 127.233333)));
points.add(new OverlayItem("India", "India", new GeoPoint(28.613333, 77.208333)));
points.add(new OverlayItem("Russia", "Russia", new GeoPoint(55.75, 37.616667)));
points.add(new OverlayItem("France", "France", new GeoPoint(48.856667, 2.350833)));
points.add(new OverlayItem("Canada", "Canada", new GeoPoint(45.4, -75.666667)));
```

```
ItemizedOverlayWithFocus<OverlayItem> myItemizedOverlay =
    new ItemizedOverlayWithFocus<OverlayItem>(this, points, myOnItemGestureListener);
mOpenMapView.getOverlays().add(myItemizedOverlay);
myItemizedOverlay.setFocusItemsOnTap(true);
```

Hola Mundo en osmdroid

- MainActivity.java

```
ItemizedIconOverlay.OnItemGestureListener<OverlayItem> myOnItemGestureListener
    = new ItemizedIconOverlay.OnItemGestureListener<OverlayItem>() {

    @Override
    public boolean onItemLongPress(int arg0, OverlayItem arg1) {
        // TODO Auto-generated method stub
        return false;
    }

    @Override
    public boolean onItemSingleTapUp(int index, OverlayItem item) {
        Toast.makeText(
            MainActivity.this,
            item.getSnippet()+ "\n" + item.getTitle() + "\n"
                + item.getPoint().getLatitude() + " : "
                + item.getPoint().getLongitude(),
            Toast.LENGTH_LONG).show();

        return true;
    }
};
```



Hola Mundo en osmdroid

- Otros Overlay

```
MinimapOverlay miniMapOverlay =  
    new MinimapOverlay(this, mOpenMapView.getTileRequestCompleteHandler());  
miniMapOverlay.setZoomDifference(5);  
miniMapOverlay.setHeight(200);  
miniMapOverlay.setWidth(200);  
mOpenMapView.getOverlays().add(miniMapOverlay);
```

```
mRotationGestureOverlay = new RotationGestureOverlay(mOpenMapView);  
mRotationGestureOverlay.setEnabled(true);  
mOpenMapView.setMultiTouchControls(true);  
mOpenMapView.getOverlays().add(this.mRotationGestureOverlay);
```

```
mLocationOverlay = new MyLocationNewOverlay(new GpsMyLocationProvider( this ),mOpenMapView);  
mLocationOverlay.enableMyLocation();  
mOpenMapView.getOverlays().add(mLocationOverlay);
```



OSMBonusPack

```
allprojects {  
    repositories {  
        ...  
        maven { url 'https://jitpack.io' }  
    }  
}
```

```
dependencies {  
    compile 'com.github.User:Repo:Tag'  
}
```

```
dependencies {  
    ...  
    compile 'com.github.MKergall:osmbonuspack:6.4'  
}
```



Añadir Marcador en el mapa

```
Marker startMarker = new Marker(map);  
startMarker.setPosition(new GeoPoint(4.63731, -74.08274));  
startMarker.setAnchor(Marker.ANCHOR_CENTER, Marker.ANCHOR_BOTTOM);  
map.getOverlays().add(startMarker);  
map.invalidate();
```



Routing (OSMRoadManager)

```
RoadManager roadManagerLine = new OSMRoadManager(this);
ArrayList<GeoPoint> points = new ArrayList<GeoPoint>();
points.add(new GeoPoint(4.6503, -74.0660));
points.add(new GeoPoint(4.6346, -74.0795));
Road roadLine = roadManagerLine.getRoad(points);
Polyline roadOverlayLine = RoadManager.buildRoadOverlay(roadLine);
map.getOverlays().add(roadOverlayLine);
```



Routing(MapQuestRoadManager)

MapQuest service (<http://developer.mapquest.com>)

```
RoadManager roadManager = new MapQuestRoadManager("_YOUR MAPQUEST API KEY_");  
roadManager.addRequestOption("routeType=bicycle");
```




MapQuest Information

- **fastest:** Quickest drive time route
- **shortest:** Shortest driving distance route
- **pedestrian:** Walking route; Avoids limited access roads; Ignores turn restrictions
- **bicycle:** Bike route; Avoids limited access roads; Avoids roads where bicycle access is false; Favors bike specific paths and lower maxspeed roads
- **multimodal:** Combination of walking and (if available) public transit

Accessing Road Information

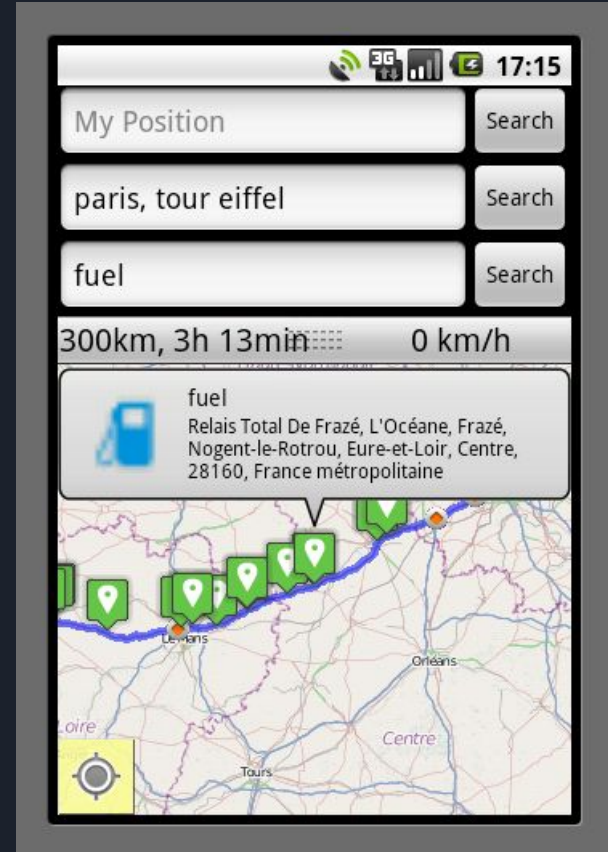
```
Drawable nodeIcon = getResources().getDrawable(R.drawable.marker_node);
for (int i=0; i<road.mNodes.size(); i++){
    RoadNode node = road.mNodes.get(i);
    Marker nodeMarker = new Marker(map);
    nodeMarker.setPosition(node.mLocation);
    nodeMarker.setIcon(nodeIcon);
    nodeMarker.setSnippet(node.mInstructions);
    nodeMarker.setTitle("Step "+i);
    nodeMarker.setSubDescription(Road.getLengthDurationText(this, node.mLength, node.mDuration));
    Drawable icon = getResources().getDrawable(R.drawable.ic_continue);
    nodeMarker.setImage(icon);
    map.getOverlays().add(nodeMarker);
}
```

POI (Point of Interest)

```
NominatimPOIProvider poiProvider = new NominatimPOIProvider("http://nominatim.openstreetmap.org/");  
ArrayList<POI> pois = poiProvider.getPOICloseTo(startPoint, "cinema", 50, 0.01);
```

```
FolderOverlay poiMarkers = new FolderOverlay(this);  
map.getOverlays().add(poiMarkers);  
  
Drawable poiIcon = getResources().getDrawable(R.drawable.marker_poi_default);  
for (POI poi : pois){  
    Marker poiMarker = new Marker(map);  
    poiMarker.setTitle(poi.mType);  
    poiMarker.setSnippet(poi.mDescription);  
    poiMarker.setPosition(poi.mLocation);  
    poiMarker.setIcon(poiIcon);  
    if (poi.mThumbnail != null){  
        poiMarker.setImage(new BitmapDrawable(poi.mThumbnail));  
    }  
    poiMarkers.add(poiMarker);  
}
```

POI (Point of Interest)



```
ArrayList<POI> pois = poiProvider.getPoiAlong(road.getRouteLow(), "fuel", 50, 2.0);
```

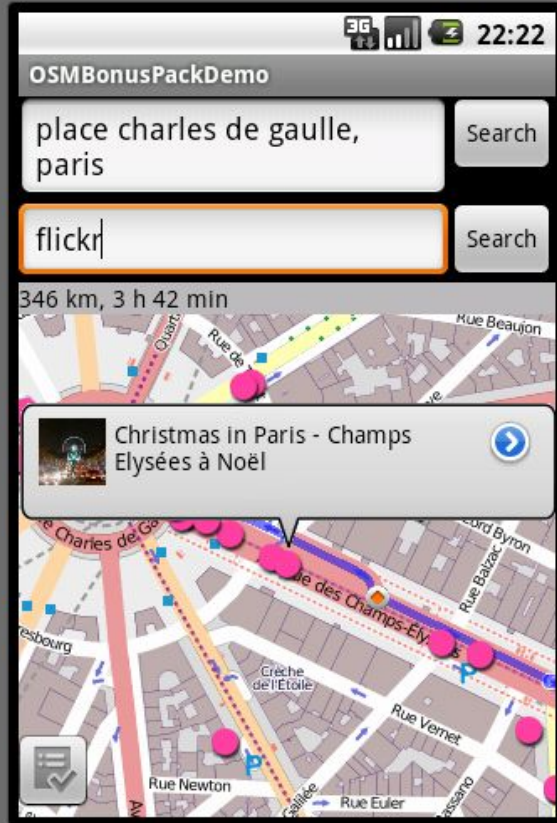
GeoName

<http://www.geonames.org/>



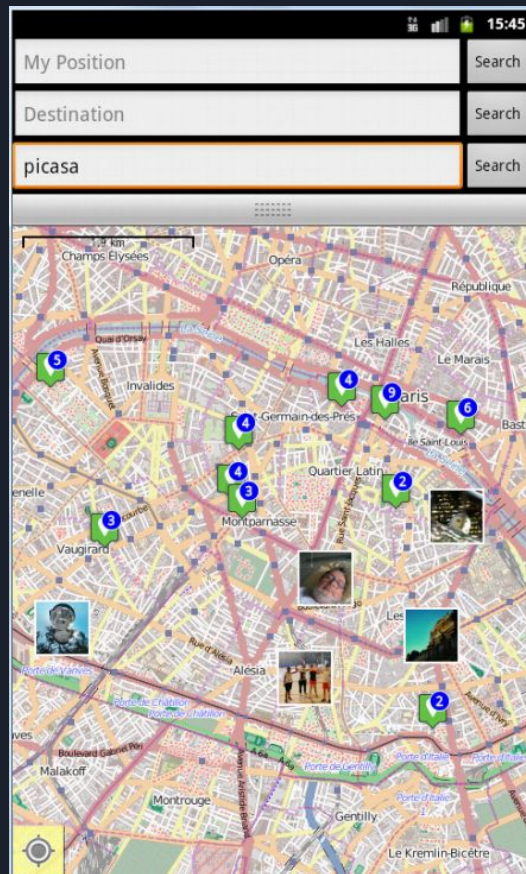
```
GeoNamesPOIProvider poiProvider = new GeoNamesPOIProvider("YOUR_GEONames_ACCOUNT");  
ArrayList<POI> pois = poiProvider.getPOIInside(map.getBoundingBox(), 30);
```

Flickr



```
FlickrPOIProvider poiProvider = new FlickrPOIProvider("YOUR_FLICKR_API_KEY");  
BoundingBoxE6 bb = map.getBoundingBox();  
ArrayList<POI> pois = poiProvider.getPOIInside(bb, 20);
```


Picasa





Clustering

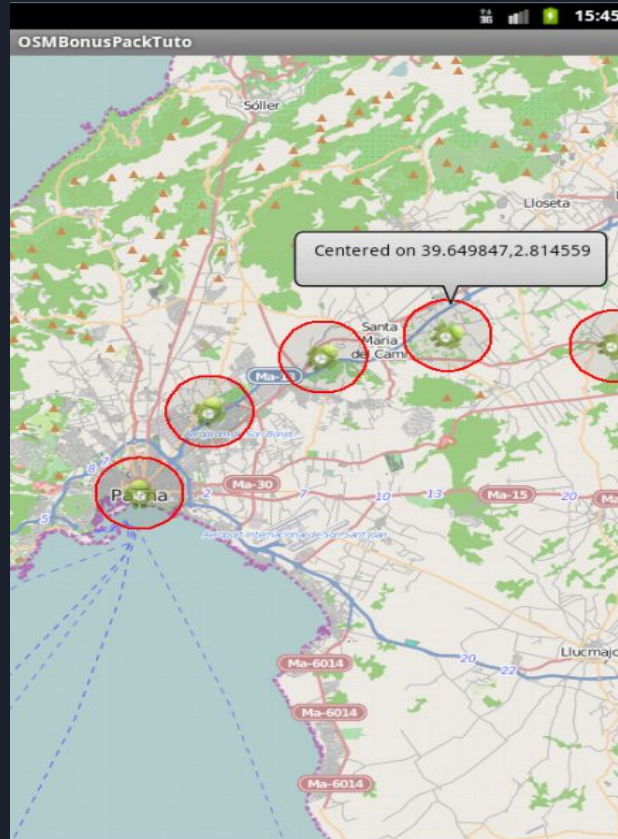
```
//FolderOverlay poiMarkers = new FolderOverlay(this);  
RadiusMarkerClusterer poiMarkers = new RadiusMarkerClusterer(this);
```




KML Content (Keyhole Markup Language)

```
KmlDocument kmlDocument = new KmlDocument();  
String url = "http://mapsengine.google.com/map/kml?forcekml=1&mid=z6IJfj90QEd4.kUUY9FoHFRdE";  
kmlDocument.parseKMLUrl(url);  
  
FolderOverlay kmlOverlay = (FolderOverlay)kmlDocument.mKmlRoot.buildOverlay(map, null, null, kmlDocument);  
map.getOverlays().add(kmlOverlay);
```

Map Events





Referencias

- <https://github.com/MKergall/osmbonuspack/wiki>
- http://wiki.openstreetmap.org/wiki/Nominatim/Special_Phrases
- https://github.com/MKergall/osmbonuspack/blob/master/OSMNavigator/src/main/res/values/poi_tags.xml
- <https://github.com/osmdroid/osmdroid/wiki>