Augmented Reality

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Quality, Dedication, Cost

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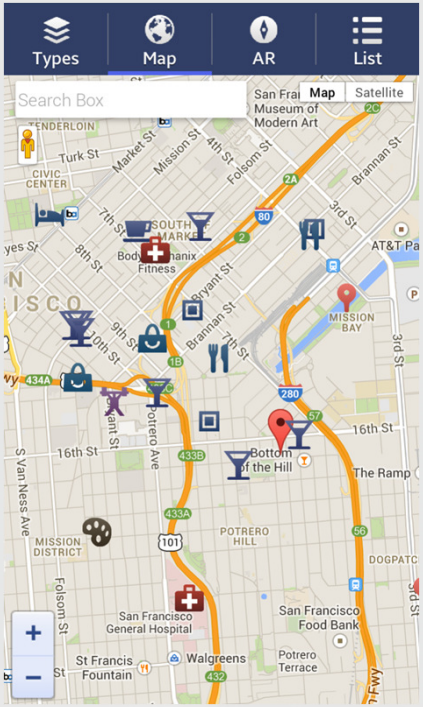
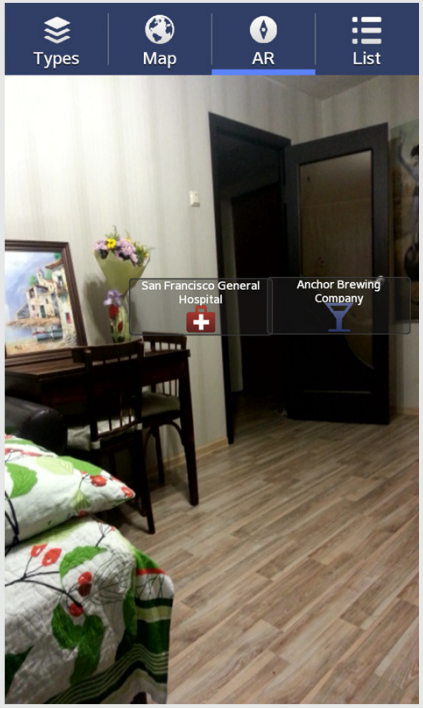
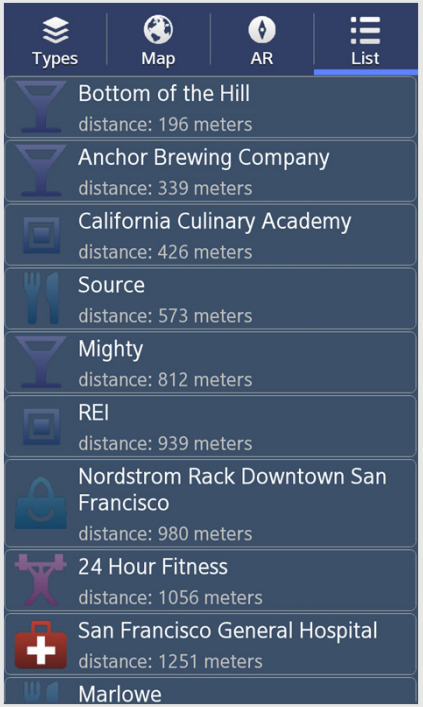
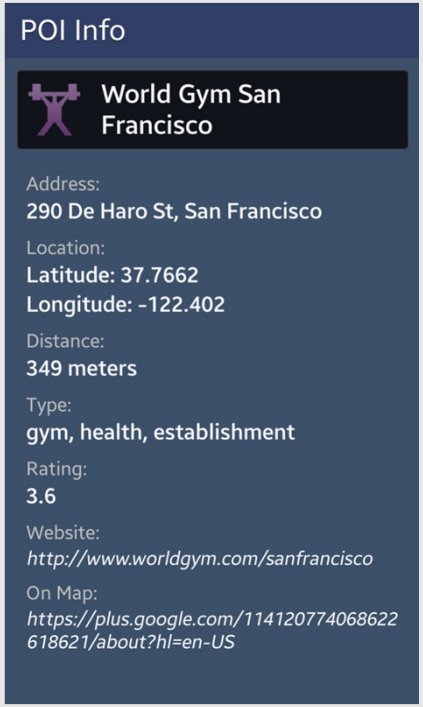
TIZEN™ DEVELOPER CONFERENCE 2014 SAN FRANCISCO

Points of Interest

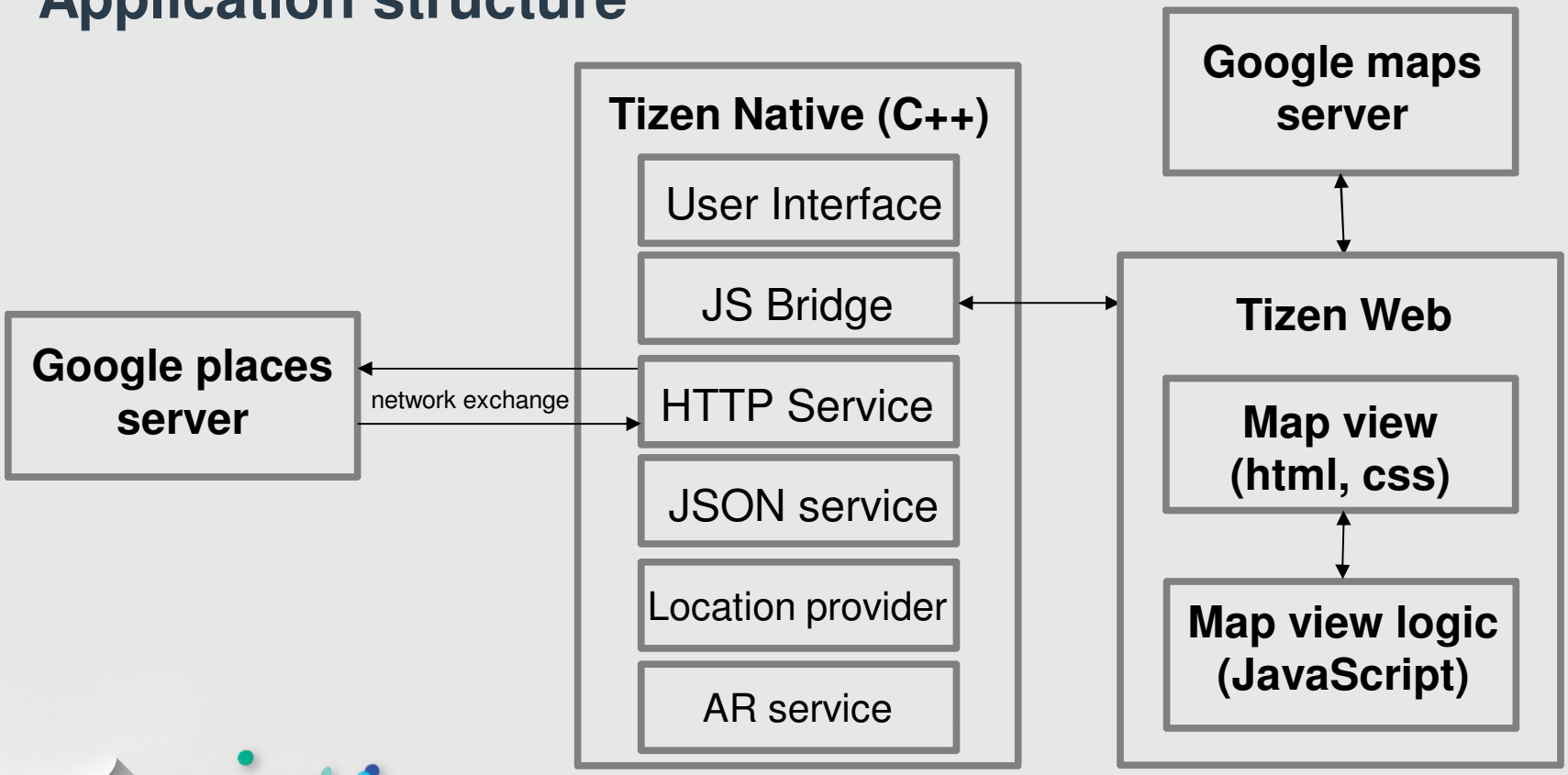








Application structure



Location provider

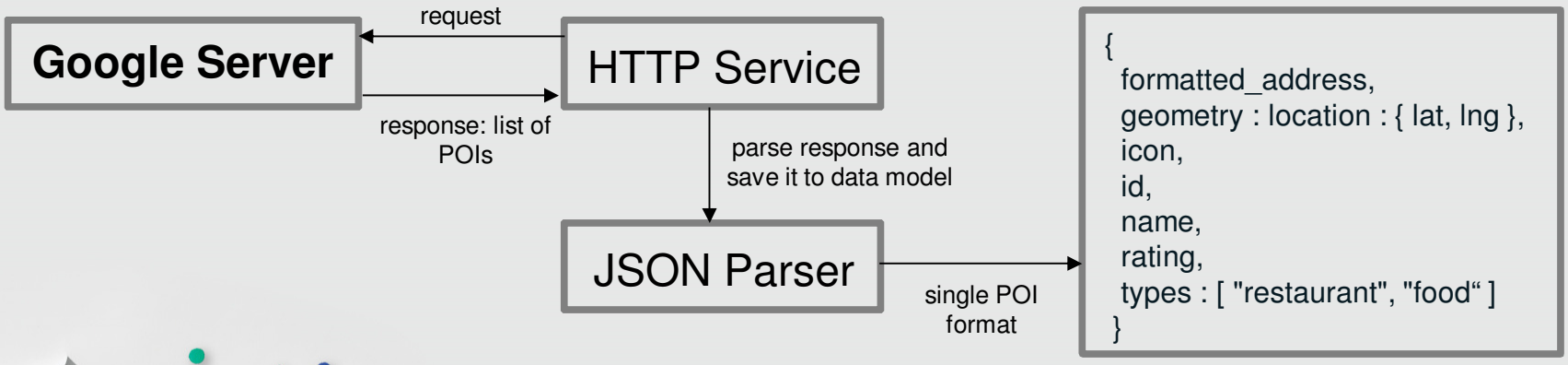
- Get location with LOC_ACCURACY_ANY accuracy for the first time, and further refine with LOC_ACCURACY_FINEST
- Use cell-id, WI-FI and GPS system services
- Use a separate thread for updating location
- Try to Get Location at first, after Get Last Known Location and use timing Get Location if failed to get first time. Update location with schedule.

```
LocationCriteria opts;
opts.SetAccuracy(LOC_ACCURACY_FINEST);

Location loc = LocationProvider::GetLocation(opts);

Location loc = LocationProvider::GetLastKnownLocation();
```

Interaction with Google Places server

- After acquiring location send HTTP request to Google server
- Set radius to search nearby places
- Use types to search places: *restaurants, business, people, shops, movies, health, gas stations and other…*

```
https://maps.googleapis.com/maps/api/place/nearbysearch/json?location="”&radius="”&types="”
```



Map

Map view structure. Use Hybrid Application structure to implement maps

FormMap.cpp

Web View

```
m_WebView = static_cast <Web*>
(GetControl(IDC_WEB, true));

m_jsBridge = new JsBridge(m_WebView);
m_WebView-
>AddJavaScriptBridge(*m_jsBridge);
m_WebView->SetLoadingListener(this);

m_WebView->LoadUrl( L"file://" +
App::GetInstance()->GetAppDataPath()
+ L"map.html");
```

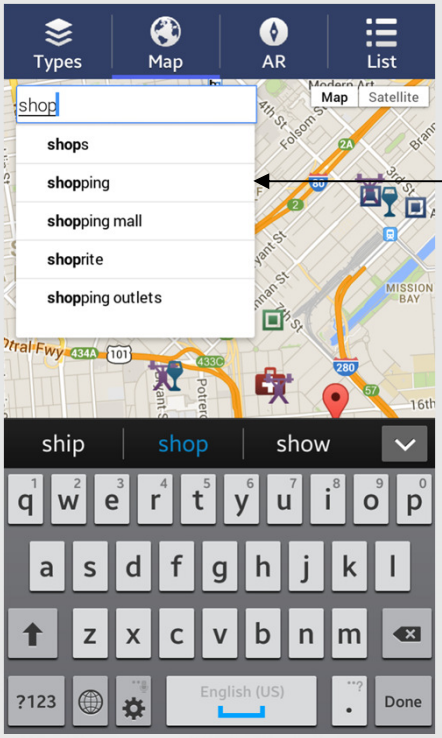
JsBridge.cpp

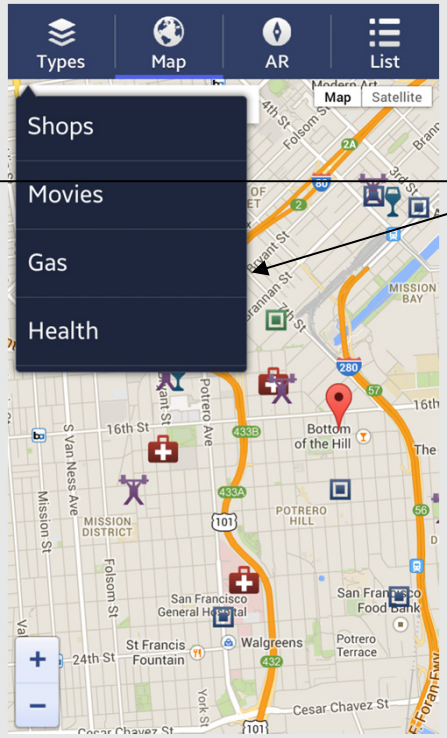
- SetLocation()
- SetRadius()
- SetTypes()

map.html

```
var mapProp = { center: myCenter,
zoom: 13, scrollwheel: true, mapTypeId:
google.maps.MapTypeId.ROADMAP };

map = new google.maps.Map(
document.getElementById("map-canvas"),
mapProp);

var request = { location: myCenter,
radius: radius, types: types };

infowindow = new
google.maps.InfoWindow();
service = new
google.maps.places.PlacesService(map);

service.nearbySearch(request, callback);
```

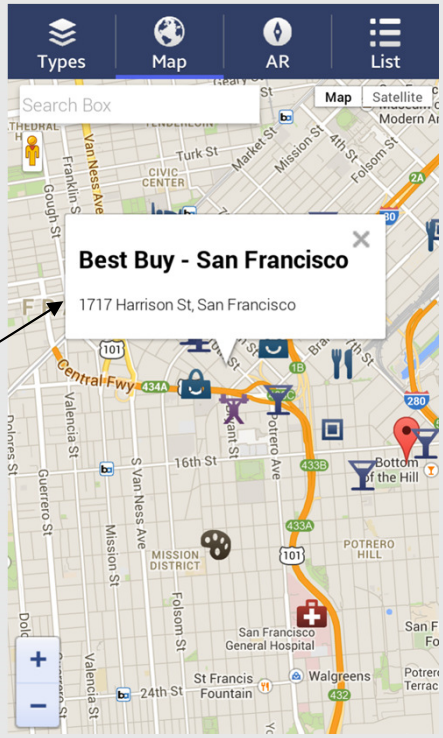
Map view example





Use search bar or menu to search places

Place info on map



Augmented Reality

Augmented Reality structure

FormAR.cpp

Camera preview

```
m_Camera = new Camera();
m_Camera->Construct(*this,
CAMERA_PRIMARY);
m_Camera->PowerOn();
…

m_Overlay = GetOverlayRegionN( rect,
OVERLAY_REGION_TYPE_PRIMARY_CAMERA);

m_Overlay->GetBackgroundBufferInfo(
bufferInfo);

m_Camera->StartPreview(&bufferInfo,
true);
```

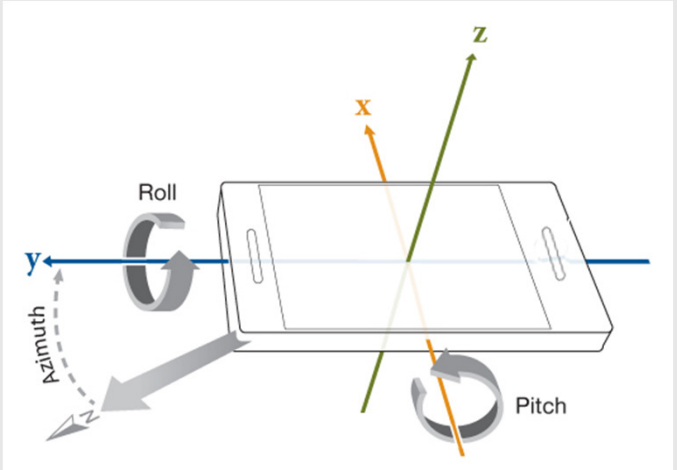
- Use class Tizen::Media::Camera to display camera preview
- Use OpenGL library to display points over camera preview

```
class Point {
  …
  String m_Text;
  Bitmap *m_Icon;
  Coordinates Location;
  virtual void OnDraw() {
    CanvasTexture *pCanvasTexture = new (std::nothrow) CanvasTexture;
    pCanvasTexture->Construct( textureId, rect.width, rect.height );

    Canvas *pCanvas = pCanvasTexture->GetCanvasN();
    DrawIcon(m_Icon);
    DrawText(m_Text);
    pCanvas->Show();
  }
};
```

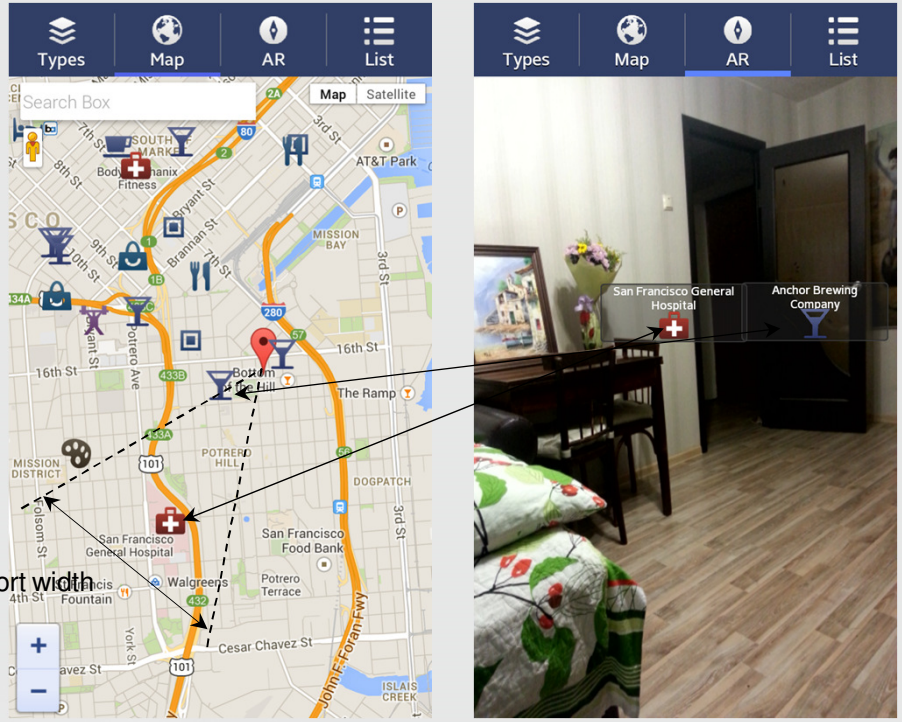
Augmented Reality: Sensor Manager and Calibration

- Use Sensor Manager to get sensor data in real time: roll, pitch and azimuth;
- Calibrate all POIs with current TiltSensorData;
- Refresh UI after calibration.

```
m_SensorMgr.Construct();
m_SensorMgr.GetMinInterval(SENSOR_TYPE_TILT, interval);
m_SensorMgr.AddSensorListener(*this, SENSOR_TYPE_TILT, interval, true);

void FormAR::OnDataReceived(SensorType sensorType, SensorData& sensorData,
 result r)
{
   TiltSensorData& data = static_cast<TiltSensorData&>(sensorData);

    // Set roll, pitch and azimuth for current location
    GoogleServices::GetInstance()->m_CenterSensorData = data;

    // Update canvas with new places coordinate
    UpdateVisiblePlaces();
}
```



Augmented Reality example



- During rotation of the device, form receives callback events from Sensor Manager;
- The application recalculates POIs coordinates;
- Check POIs for viewport width and height, translate POI coordinates to screen coordinates;
- Draw visible POIs;
- With the screen rotation we rotate viewport boundaries and refresh AR view with new visible POIs.

Summary

- Hybrid application structure
- This is prototype application
- Open to use any places service

Depending on the data received from server:

- One step to road navigator application
- One step to education application
- One step to commerce application

Q&A

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