

Technical Guide Documentation

Project Title:

MyGuideDogsDane

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Table of Contents

Index	Topics of Content	Page
1.0	Abstract	1
2.0	Project Motivation	1
3.0	Project Research	2-3
4.0	Project Design	4
5.0	Project Implementation	5
6.0	Project Sample Code	6-7
7.0	Project Problems Solved	8
8.0	Project Results	8
9.0	Project Future Work	9

1.0 Abstract

In this technical guide documentation, it will be reflecting how I took the consideration of designing, implementing and producing the project aim which has been documented in the functional specification. The completion of this project will be benefit to those who have visually impaired and have no additional resources especially in finance to purchase and carrying an external GPS devices to assist them for navigation purposes. For cost saving, this is a simple orientated aid mobile application, it has four activities buttons and it work great for those who need additional information (announcement in textual representation by text-to-speech system) while taking an outdoor activity.

2.0 Project Motivation

There are few good reason that motivated me to implement this project and one of the reason was to highlight increasingly use of technologies in the current trend. Today we have various emerging technologies which impact our lives in the different ways. As an example use of smartphone and its applications, by carrying an external device can be avoided and cost saving are much easier to be achieved. As a software engineering student and adapted experience in programming skills, I'm confidence to implement my very first individual orientated aid mobile application for the blind. Prior to the designing and implementation of the mobile application, I been advised by many good thought of me, this is an opportunity for me to progress and achieve as an solo project and all eyes are focussing on the confidence and contribution to the blind communities.

3.0 Project Research

In the research areas, it is a good experience for me to read, write, listen, feel and participate to online tutorial resources. There are several resources I would like to share and comment it.

Reading Documentation

The most resource will be the Android Developer [1] for all the Android APIs and the Java APIs. Understanding use of library code and its implementation methods. Furthermore, you do need a good understanding use of Meet Android studio [2] to implement the application. Sometime, an external online resources can be a good beginning to implement this project and one of my favourite was tutorial point for Android [3] which have most of the online tutorial that you can learn and the Android training getting start [4]. The API Guides [5] has all the API guides and introduction. During the design phrase, let's read on this up and running with material design [6] and is worth to take a read on the developer blog [7]. In the section develop apps [8] has the latest development on all Android's tools. Having not forgotten the APIs that I use is based on the usage-sdk [9] lists of the operation on each of its usage. The activity like exploring places with Google Map and Places APIs [10] and the current location strategies [11] which defining a model for the best performance

- Flow for obtaining user location
- Deciding when to start listening for updates
- Getting a fast fix with the last known location
- Deciding when to stop listening for updates
- Maintaining a current best estimate
- Adjusting the model to save battery and data exchange

The storage of all route data will be implemented under this Android.database class [12]

Further reading on the Eclipse IDE, I used both Eclipse IDE and Android Studio (command line) to do the coding, I recommend this installation from how to set up Eclipse IDE for Android [13]

[1] <https://developer.android.com/index.html>

[2] <https://developer.android.com/studio/intro/index.html>

[3] <https://www.tutorialspoint.com/android/>

[4] <https://developer.android.com/training/index.html>

[5] <https://developer.android.com/guide/index.html>

[6] <https://developer.android.com/design/index.html#latest>

[7] <https://android-developers.googleblog.com/>

- [8] <https://developer.android.com/develop/index.html>
- [9] <https://developer.android.com/guide/topics/manifest/uses-sdk-element.html>
- [10] <https://developer.android.com/distribute/best-practices/engage/maps-and-places.html>
- [11] <https://developer.android.com/guide/topics/location/strategies.html>
- [12] <https://developer.android.com/reference/android/database/package-summary.html>
- [13] <http://www.instructables.com/id/How-To-Setup-Eclipse-for-Android-App-Development/>

Writing

The project hasn't much to write about it. Nonetheless, there are several points require to mark it such as at the design phrase, application functional specification, define all resources that require to implement this project such as use of programming library codes and ensure provide the best result at the end of the project. Most of the composing materials will be relied on the documentation styles. The Gitlab resource is simply a platform for the project to share, update and get other repos activity.

Listening

Today, we can get sharable all the materials (project elements) on the drive, or even upload to YouTube. I have listened most of the Android tutorial on this channel. I supposed, it is good to learn and explore different programming skills with others online.

Feel

I have borrowed a GPS device for my project research purposes. I thought it will be benefit for me to determine and create something that allow me to design my idea initially. I used breed tracker as my reference and ideally this GPS device have motivated me to implement a mobile application.

Participate Online Tutorials

All of my project is based on online tutorials. As mentioned previously, I participate a lot of Android tutorials via developer.android.com/training. I have also learned sample code from my friends (software developer).

4.0 Project Design

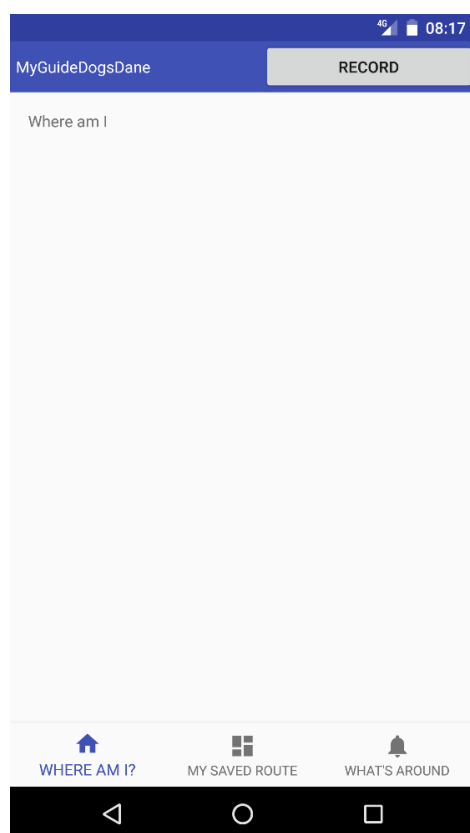
Program Background

The objective of this MyGuideDogsDane design is to help visually impaired people to find the way while walking it's to an unknown place. By getting real-time information through GPS, the application will provide a textual representation information via text-to-speech system.

The application will also provide step-to-step navigation to locate their desire destination and it's also allow user(s) to record their favourable landmark or route.

Targeted User

The design is opened to all types of user(s) and there are no limitation and the design is considered provide a non-carry external GPS device and achieving cost saving.



Activity Components

Where AM I function requires a retrieve event from real-time information through GPS system.

My Saved Route function requires a storage database when making an inquiry in navigation purposes.

What's Around function requires an explore activity from a surrounding public and private businesses events.

Record function requires a record task for all route been taken.

5.0 Project Implementation

Background

The application is an orientated aid use of GPS (Global Positioning System) to retrieve a real-time information for user(s) and information will be announced in textual representation by text-to-speech system.

Purpose

The aim of MyGuideDogsDane is to provide a “hand-free” convenience to user(s) where carry an external GPS device while walking it in an unfamiliar place. Therefore, cost saving can be made.

System Overview

The architecture of MyGuideDogsDane is implemented in Android mobile application platform. The coding style is strictly under Java programming language.

System Description

The underline of Android OS is supported to MyGuideDogsDane’s functionality, it provides a resource where use of Google Place, Google GeoLocation, Google Map Location Service and its implemented policy are separated in this project. All Map APIs are subjected to Google Map Location Service license.

The functionality of MyGuideDogsDane is provided to user(s) use of as a real-time information and all its data is kept separately in MyGuideDogsDane’s database which has been implemented on the application memory resources.

MyGuideDogsDane provides a real-time information by retrieving, recording and creating a landmark data via GPS system.

System Organization and Major Task

The application structure is built with interaction on the screen in which activities button will be pressed to simulate its activity functionality.

Where Am I activity simulate users(s) current location, it provides a real-time information as in address format.

My Saved Route activity simulate the recorded landmark, it provides a history of user(s) destination details and it can be used as a future navigation purposes.

What’s Around activity simulate a surrounding location where public and private businesses activity will be explored and it uses as a place of interest for user(s) for navigation purposes.

Record activity simulate to perform a route recording, the recorded route will be stored in the My Save Route activity.

System Reference

The key of MyGuideDogsDane is about cost saving and avoid carrying an external GPS device. The application is easy to use and provide a convenience at anywhere and whenever user(s) wish to use it.

6.0 Project Sample Code

The code following below is the sample code for the project and subject to review suitability.

Get current location

// This example provides current location update using GPS provider.

```
/**
 * Create an instance of location manager
 * listen to a location manager
 */

protected LocationManager locationManager;
protected LocationListener locationListener;
protected Context context;
TextView total;
String let;
String provider;
protected String latitude, longitude;
protected boolean gps_enabled, network_enabled;

@Override
protected void onCreate(Bundle savedInstanceState) {
    super.onCreate(savedInstanceState);
    setContentView(R.layout.activity_main);
    txtLat = (TextView) findViewById(R.id.textview1);

    locationManager = (LocationManager) getSystemService(Context.LOCATION_SERVICE);
    locationManager.requestLocationUpdates(LocationManager.GPS_PROVIDER, 0, 0, this);
}
```


@Override

```
public void onLocationChanged(Location location) {  
    txtLat = (TextView) findViewById(R.id.textview1);  
    txtLat.setText("Latitude:" + location.getLatitude() + ", Longitude:" + location.getLongitude());  
}
```

@Override

```
public void onProviderDisabled(String provider) {  
    Log.d("Latitude","disable");  
}
```

@Override

```
public void onProviderEnabled(String provider) {  
    Log.d("Latitude","enable");  
}
```

@Override

```
public void onStatusChanged(String provider, int status, Bundle extras) {  
    Log.d("Latitude","status");  
}  
}
```

7.0 Project Problems Solved

In the early stage of starting this project, there were several considerations related to what sorts of programming language that require to implement MyGuideDogsDane. Initially, there are few choices are opened for the project such as the C Sharp, C++ and Java programming, subsequently the decision was made to use Java programming for this project and the lead for the selection was Google Android has retained all the Google Map Location Services API and other Map resources and they are easy to deploy in the implementation.

The other project problems were based on the related to the app's functionality and these all have been dealt and managed, suggestion given by the project's supervisor and a resource from online programmer communities help.

8.0 Project Results

The result of MyGuideDogsDane is expected to deliver as documented in the project function specification document. The document can be found at the URL link provided at the end of this section heading.

The aim of the project was to minimize use of any interaction on the keyboard while walking into a busy noise places and by just respond on few buttons and listening to the request respond on any real-time information which provide by text-to-speech system.

The other benefits of MyGuideDogsDane are avoiding carry an external GPS device for navigation purposes and cost saving. The description of each functionality results on MyGuideDogsDane are described in the heading of Project Design.

Functional specification URL link:

<https://gitlab.computing.dcu.ie/chankok2/2017-ca400-chankok2/docs/functional-spec/>

9.0 Project Future Work

As this project progress, there are several functionalities within MyGuideDogsDane's app will be improved depending on the user feedback and an external resource to help to improve the application ideas, management and financial support. For the moment, the MyGuideDogsDane is only available in Android platform, the plan is to expand the availability in others leading mobile operating system at the convenience time.

The scales of the improvement included:

- Implementing in a cross platform, i.e. use of Xamarin technology coding in C Sharp programming
- Create a test tools to test the efficiency of the application, i.e. J Units tool
- Take a various of case study of use of orientation aid applications within the related communities and organizations
- Constantly examine the latest Map Location Services update and its documentation and use of Map policy
- Implements additional functionality within the application, i.e. an object recognition camera and provide a phone call help