

# Wibo

## A Connectivity Map Builder

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## Analysis: requirements

### Encode Google Maps Areas

- use Google Api
- choose a valid encoding for representing areas instead of points
- areas should be encoded in a way such that the whole space can be covered

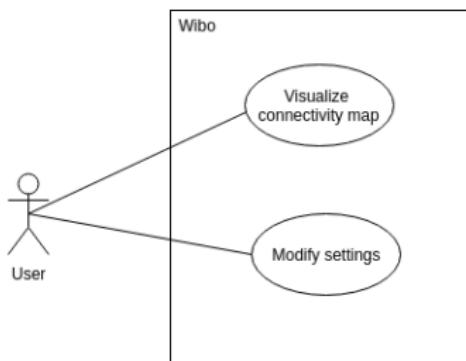
### Encode the RSSI

- visualize the connectivity strength through coloring the areas with a color scale
- the data should be acquired again if an amount of time has elapsed
- two (or more) measurements about the same area have to be visible in some way

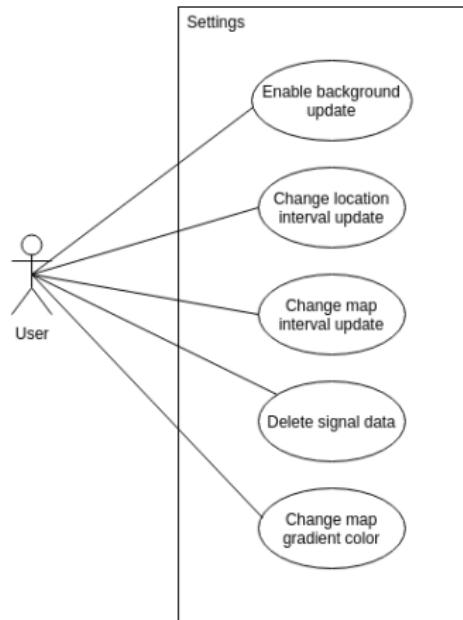
### Support at least three technologies

- LTE, UMTS, WIFI

## Analysis: use cases



(a) wibo use cases



(b) settings use cases

## Design: CRC cards

Map	
Visualize map	LocationUpdate Database Drawer

(a) Map card

Settings	
Visualize settings Apply changes	Map Database Drawer

(b) Settings card

Database	
Store signal info	Area Drawer LocationUpdate

(a) Database card

CoordinatesCalculator	
Elaborate coordinates	LocationUpdate Area Map

(b) CoordinatesCalculator card

# Design: CRC cards

Drawer	
Draw signal areas	Area Map Database

(a) Drawer card

LocationUpdate	
Handles location updates Set current position	Map Area Database CoordinatesCalculator

(b) LocationUpdate card

Area	
Knows coordinates Knows signal type Knows signal strength Knows timestamp	Database CoordinatesCalculator Drawer LocationUpdate

(a) Area card

## Design: database

### Database description

The database is composed by a single table which stores information about a specific area. Each row has the following fields:

- **mgrsTen**: coordinates of that particular area in mgrs format
- **signalStrength**: the RSSI value of a measure taken in that area
- **connectivityType**: the type of wireless connectivity that the user was using
- **timestamp (Primary Key)**: the instant in which the measure was recorded

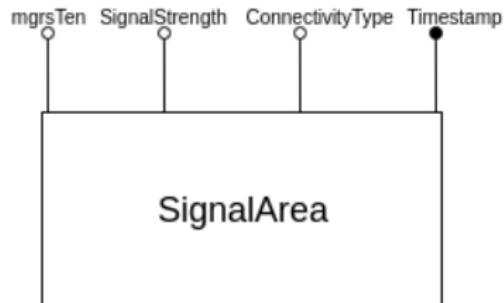


Figure : ER diagram

SignalArea

<u>timestamp</u>	signalStrength	connectivityType	mgrsTen

Figure : db scheme

## Design: database - queries

- ① Get average signal strength of an area for a particular connectivity type
- ② Get average signal strength grouped by mgrs coordinates for a particular connectivity type
- ③ Delete all signal area info related to a connectivity type from the database
- ④ Get all area info for a particular connectivity type and a specific area
- ⑤ Get the greatest signal area timestamp value for a particular connectivity type
- ⑥ Get all signal strength values for a particular connectivity type

# Implementation: java packages

## Packages description

- Activity: activities code
- Coord: code related to coordinates handling
- Draw: code to draw areas
- Persistence: code that implements the database
- Utils: auxiliary classes

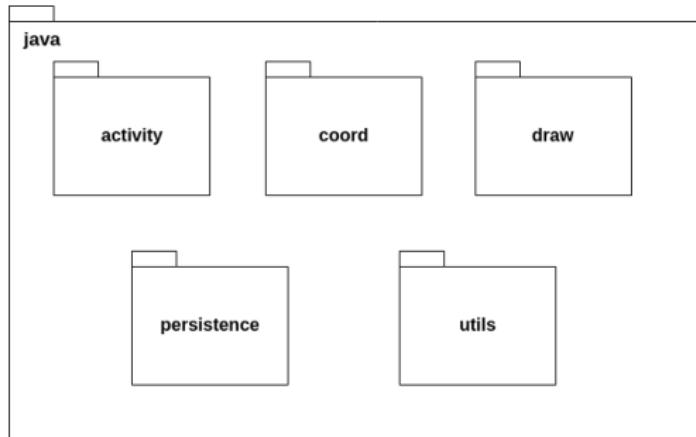
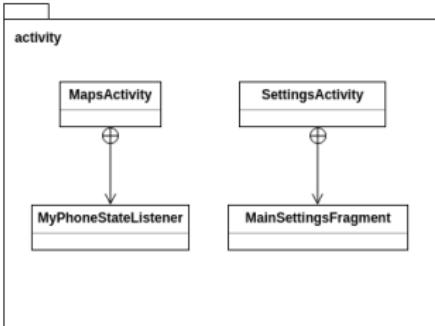
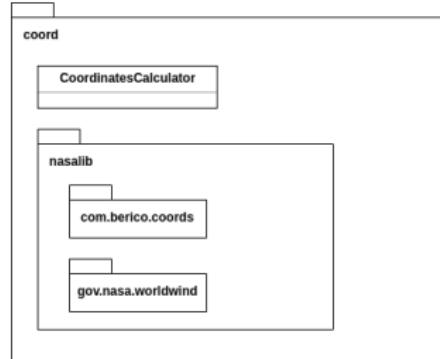


Figure : packages

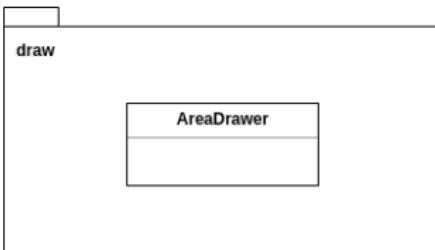
# Implementation: java packages



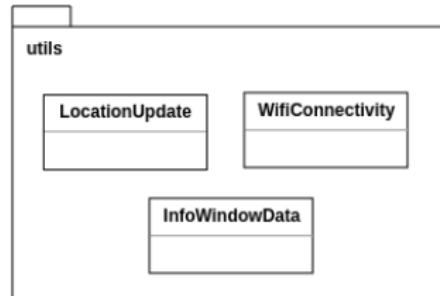
(a) activity package



(b) coord package

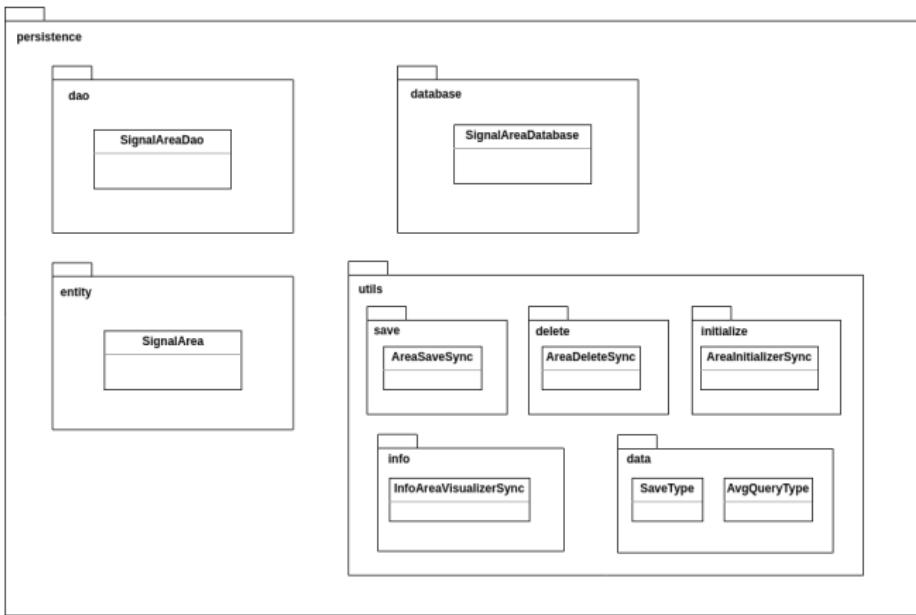


(a) draw package

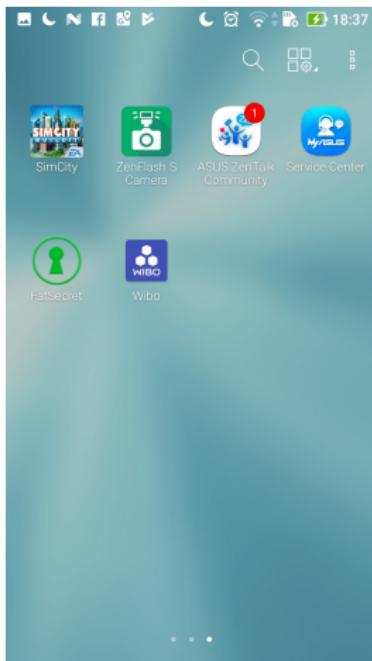


(b) utils package

# Implementation: java packages



## Overview: logo



(a) launcher icon



(b) splash screen

# Overview: UI

## UI description

The UI shows:

- a map in the background
- at the top a toolbar with two options items
- at the bottom-right a text which indicates the connectivity map type that the user is visualizing
- an info window related to the area where the user has long clicked the screen

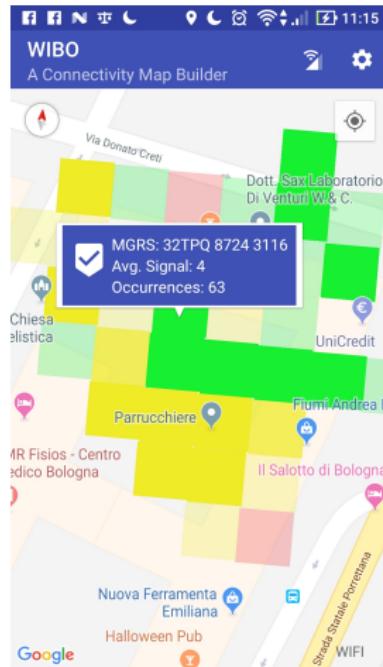


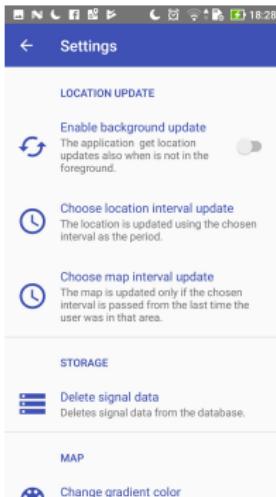
Figure : UI

## Overview: UI - options items

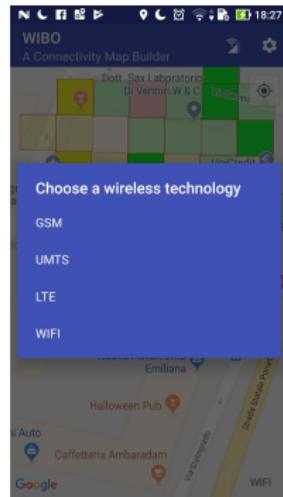
### Settings description

Through settings the user can:

- enable background update
- change location interval update
- change map interval update
- delete signal data
- change map gradient color

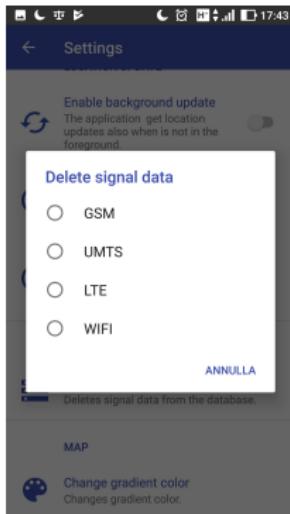


(a) settings option selected

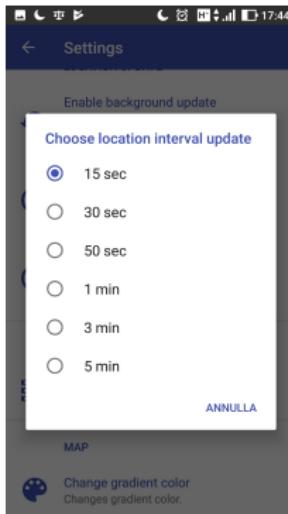


(b) connectivity option selected

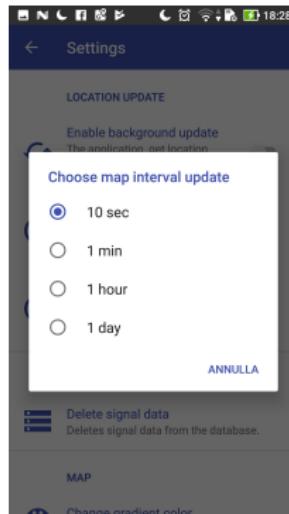
# Overview: settings



(a) delete signal data from db

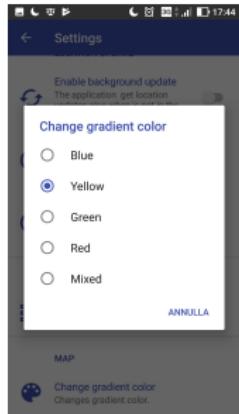


(b) location interval update

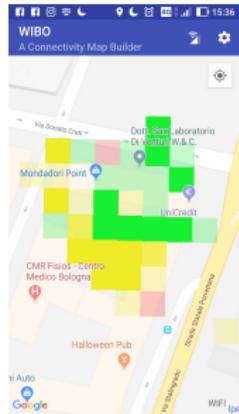


(c) map interval update

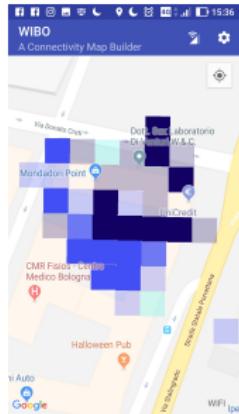
# Overview: settings



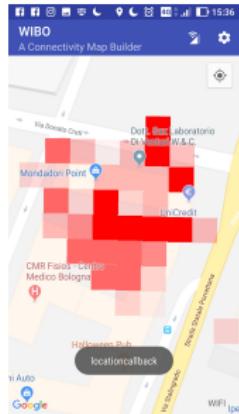
(a) gradient



(b) mixed



(c) blue



(d) red

*Thanks for your attention!*