Spotter *get around by spotting*

by José Bateira ei10133@fe.up.pt
supervised by Rui Rodrigues rui.rodrigues@fe.up.pt

Scan spots through FEUP's campus with qrcodes or nfc tags to:

- get directions to another spot;
- get information about a scanned spot;
- meet friends: set scanned spot as meeting point, or report to your friends your current location spot (e.g. send sms with the spot info to a friend)
- foursquare check-in (?)

This can be done using the android app or the webapp.
Whether you use the android app or the webapp, you can scan spots and get the info you want all-in-one (no need to have a qrcode scanner app for example).
In the android app, you can scan spots offline, with no internet connection.

Types of spots

There are several types of spots:

- food spots: bar biblioteca, cantina, cafetaria, snack-bar, restaurante, vending machines, ...
- meeting spots: cica, queijos, entrada principal, pátio biblioteca, ...
- event spots: grande auditório, queijos, biblioteca, …
- class spots: salas, salas de computadores, queijos,
- work spots: sala de estudo, salas de computadores, biblioteca, cafetaria, salas de trabalho específicas dos departamentos, laboratórios, centros de investigação, …
- services spots: cica, secretaria, tesouraria, dcop, aefeup, ...

These types of spots should work as tags. So for example "biblioteca" can have more than one tag since it can be used for events and working.
This way you can search/filter spots by tags.

Directions and shortest path to a spot

When a user wants to find a spot, the user scans a nearby spot to get the current position, and then can select from a mini-map the nearest spots available. Zooming out can be used to find farther spots. When a spot is selected as a target spot, the user gets a path to that spot. That path should be the shortest path to that spot given the current user's position.

To achieve this, each spot will be a node in a graph that represents the whole campus.
There should be intermediate nodes not visible to the user that are used to mark paths between spots, in order to have a much more detailed path generation. This way, the Dijkstra's algorithm, for example, can be used to determine the shortest path between the users location and the destination spot.

Physical location of spots on the map

Each spot will have GPS coordinates, but each spot's GPS coordinates should be inserted in the "database" manually (through google maps for example), after placing the qrcodes/nfc tags physically in the spot's location, in order to get more accurate locations of the spots.
Unfortunately, the whole graph that represents the campus will be created manually, although later on, a tool can be created to ease and automate a bit that process.

User interface

Given the nature of Spotter, the user must have a smooth and fast experience with the mobile app or webapp. This is because the user is looking for a faster way to move in the campus, and so if Spotter is not easy and fast to use, the user will just simply wander the campus because it's faster than looking at a tiny screen with complicated options that don't help the user to be faster moving in the campus.

User target

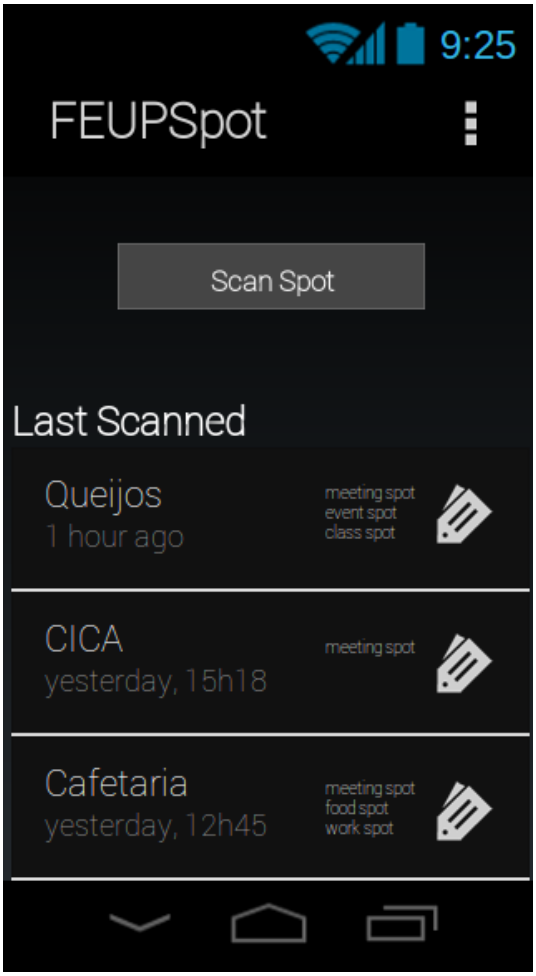
Spotter is targeted for new students, faculty or guests at FEUP that need to get around the campus fast and easy. Very useful for big events like conferences that are hosted at FEUP.

Mobile app features:

- scan spot
- see scan history
- Search/filter spots
- see top spots scanned
- my friends spots
- share spots
- …

Webapp features:

- All the above from the mobile app
- Share link/qrcode of spot through email (useful when advertising an event)
- ...



Proof of Concept

For SSIM's project, a proof of concept prototype will be implemented with a simple map (part of FEUP's campus) with a few spots. The spots will mark hallways and corridors with information related to available services like printers, vending machines, ATM's, bathrooms and such.
The **prototype** will be a **website application** developed with special care for mobile devices.

Future work

Although Spotter is intended to target FEUP's campus, this project is just a proof of concept of *indoor* localization: creating a graph of spots on a campus' map can be very useful for other large sitemaps like, for example, any other college campus, theme parks, enterprise/corporate buildings and much more.

Given this, another project would be to add an additional feature to allow for an admin user to create a sitemap and create a graph of spots. The users would then be able to use and see that sitemap on their smartphones/tablets right after they scan their first spot of that new site.
The user would then have a general view of the sitemaps they visited.