Bachelor's Thesis

Geo-localization and routing in complex multi-floor environments
Efficient path mapping and safety cultivation

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Abstract

The aim of this project is to realize a mobile application for patients of the hospital CHC Saint-Jean in Liege that will enable them to register, view appointments and find their way in the hospital. First the existing application for consulting scheduled appointments and registration is reworked to a native iOS mobile application (mobile app in short). This feature is extended with the option to view the information of the hospital and set reminders for any appointment in the near future. Second an indoor location framework is added to the reworked mobile app that shows the route to the place of appointment. After implementing the geolocation and routing, an optimization method is implemented: the ant colony optimization algorithm. The ant colony algorithm determines the shortest path to the place of appointment based on some factors such are: amount of visitors in some corridors and hallways and the amount of stairs a patient has to climb (a patient's mobility). Using the mobile app the hospital can improve their safety procedures by notifying users of the application of any problems in the hospital, these problems can be but are not limited to: fire, malfunctioning of the elevator and electrical outage.

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Introduction

Chapter 2

MapWize

2.1 The role of MapWize in the application

MapWize is a service that digitalizes architectural plans and makes them interactive. The generated map from MapWize is the one used throughout the development of the application for hospital CHC Saint-Jean in Liege.

The main reason for using this service is to take care of the digital mapping of the hospital itself, which is not a task that should be completed by developers.

The digital map will be used to show the routes from point A to point B, applied to this case: from the hospital's registration office to the place of appointment.

2.2 MapWize SDK

MapWize provides developers with a ready-made SDK for both iOS and Android. This SDK covers all important methods to

2.3 Cisco Connectected Mobile Experiences integration

The manner in which the position of a patient is retrieved is based on the nearest WiFi router of Cisco.[1]

2.3.1 Function of Cisco CMX

Chapter 3

Conclusion

Appendix A

Bibliography

[1] Jeannette M. Wing. *Computational Thinking*. 2007. URL: https://www.cs.cmu.edu/afs/cs/usr/wing/www/Computational_Thinking.pdf.