

Project Proposal - Guided Tour for Aalto Visitors – a Smartphone Application

1. Introduction

A substantial number of external visitors come to Aalto University during school-year and summer to experience our campus, buildings and architecture, for example. Our staff and students can handle only a small number of guided tours walking with the visitors through places. There are thematic tours like architecture tour, innovation tour, etc. As an example, the architecture tour is about one-hour tour in which the visitors go through Väre, Aalto Undergraduate Center, Aalto Learning Center and finally the tour ends in Dipoli. The guide tells a set of stories related to certain points of interest (POI).

In this project we will develop a smartphone application that presents a guided tour for visitors in Aalto University campus using their own smartphone. The application will present the stories related to the POI's through the smartphone.

2. Project goals

In this project you will develop a mobile application on smartphone that guides the visitors through the selected tour. The application will seamlessly navigate the user between outdoor and indoor places with help of an Augmented Reality (AR) user interface. The tour will go through a ordered list of POI's through which the user is guided. In the defined POI's predefined content will be presented using text, audio, video or animations on the smartphone.

The second software development task is to develop a content creation web tool to define the desired POI's, locate them in the map and add the desired content into the POI.

3. Technologies

It is recommended to use Android studio for development. The App is going to run on an Android phone. The suggested programming language is Java. You will need to use ARCore (<https://developers.google.com/ar/>) to track the user and present virtual contents for AR events.

The user is guided with a pre-defined route to visit the buildings one by one. The app mainly contains two parts: outdoor navigation and indoor navigation.

Outdoor navigation is used for guiding the visitor to reach the correct building. You can use GPS and Google Map / Open street map to locate the user and plan the navigation path. 2D navigation is fine for outdoor. It is also encouraged to implement AR navigation for outdoor (<https://www.youtube.com/watch?v=XWbY5jdJnHg>).

Indoor navigation is used to guide the visitor inside buildings and trigger certain AR events. You will be given a SDK which can locate the user and plan the path inside buildings. You will need to further develop the application to navigate through a set of POI's. Also, you will need to add functionality to presenting the content with respect to the POI. When the visitor is close to a POI, an event is triggered. For example, playing a video, audio or animation. You need to implement the indoor navigation and show the POI event with AR features (<https://drive.google.com/open?id=184qiMe-4IC9qEUDm6xsukBnFKSAclvDq>).

Seamless interworking between outdoor and indoor navigation systems requires new design from the team.

In addition to developing the smartphone guided tour application, the second software development task is to develop a content creation web tool to define the desired POI's, locate them in the map and add the desired content into the POI. This is a separate SW development task than can be implemented without dependences to the first SW development task. It is up to the team to decide if they make just a very simple tool or if they want to target to a fancy one.

The client will provide assistance for the SW development tasks if required.

4. Requirements for the students

Good SW skills on Java, Android will help to complete the project. As a programming task this is not very difficult and it is possible to learn also during the project.

5. Legal Issues

Intellectual Property Rights (IPR):

1. The results are published under MIT open source license.

Confidentiality:

1. The client will not share any confidential information with the students.

6. Client

Client representative(s)

- We have been doing research in Aalto with the technologies used in this project for several years and we consider ourselves experts for this project topic. We have strong interest to succeed in a fully functional open source codebase that can later be further developed. Thus, we will invest the necessary time to guide the group into successful result.
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7. Additional information

- Documentation language is English.