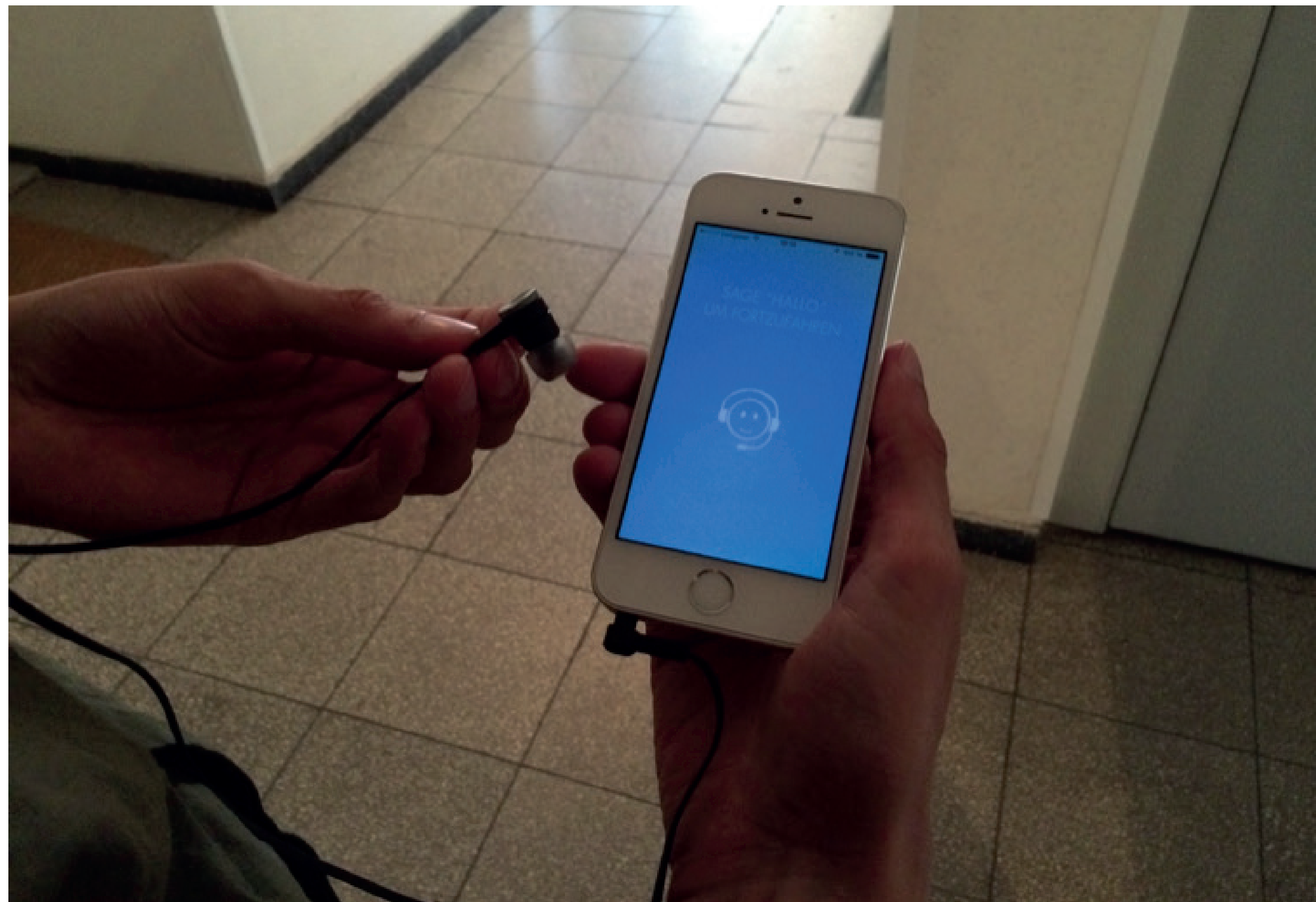


# Navigation per Audio Augmented Reality mit Headsets



Home-Screen of the app

## Special Focus

An audio augmented reality app provides a more secure ride by bike. The user can concentrate on traffic and he is not distracted by a display. He needs the visual component to get detailed information about what he should do next. Tangible announcements are needed to create an audio-based application.

Landmarks are a great convenience to make an exact announcement. In contrast to information like meters or cardinal direction, landmarks describe a special and highlighted point. It could be for example traffic signs, buildings or bridges. There are two types of landmarks available: the direction and the confirmation landmark. The direction landmark tells the user where and how he should change the direction. With a confirmation landmark the user gets information about whether he is still on track or not. Both types of landmarks provide a more secure handling with the application.

The study shows that users understand landmarks better than usual direction guiding. But it is important to provide simple and for everyone understandable points. Also they should be recognizable by day and by night. That makes it difficult to find suitable landmarks in a database.

Landmarks help to create a three-dimensional audio experience, so that the user can find the way without a display.



Usability-Test: navigation while riding a bike

## Abstract

A tourist would like to explore a town with a bikesharing-service. He needs to find a available bike first, then unlock it and choose a goal. He also needs a navigation to the goal and finally has to return it. This process should be realized by an audio augmented reality smartphone app without tactile interaction.

This speech-based application should help to provide a more secure ride by bike. During the navigation a tourist gets landmark based audio announcements, based on GPS localization. Without a display the audio messages have to be exact. So the research goal is to find out, when and where to place the announcements. Furthermore the content of these audio messages is to be determined.

To answer this question the concept was validated by two usability tests. The first test was to find out, what users need for navigating by bike. In the second test a optimized prototype should confirm the results of the previous test. The tests took place on different routes to get more detailed results.

Landmarks are easier to understand than the usual direction guiding like meters or cardinal directions. Users should get a good feeling while handling the app and understand the announcements to find the way without the display.



Usability-Test to find out, what users need

## Result and Future Work

Users associate displays with a secure application handling. But after some minutes of testing, users also developed a good feeling when using the audio based application even if they do not have a display at hand. All things considered, landmarks are more understandable than information including meters or cardinal direction. An announcement what the user have to do next should be provided early so he is able to manage the situation properly. Additionally, a function may be added to the app to repeat announcements if the user does not remember all information the app had just told him.

Further steps in this work could be to find a way, how to filter landmarks that are good in sight and which every user can understand. OpenStreetMap provides a database with lots of points of interests and landmarks. But not each item is helpful for the user. So users could for example suggest a better one, if they had difficulties to find and realize it.

Another thing to optimize could be the process to find a bike, to rent it and to return it. The user has to be navigated directly to the available bike. A technology like iBeacons may be required. For a more comfortable rent and return process, the app may lock or unlock the bike automatically, if the user is in a range of five meters next to it. This application has great potential but users have to learn how to use a audio augmented reality app first.



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