

# AR-Documentation

Benedikt Holland, Omran Hassoun, Diego Montes Voss, Lena Schelberger

## Introduction

Two groups were assigned the task to implement the digital tour through the DHBW building in Marienstraße as an augmented reality application. The user should be able to load the application on his smartphone and then scan door signs in the building. When a door sign is detected additional information about the room is displayed. This is the documentation for the first group which covers all signs except information on professors and the cantina. For example room 018 is the room of the student council. When the door sign is scanned information about the student council is displayed. The data for the additional information is collected on the already existing tour on the dhw website

(<https://www.heidenheim.dhbw.de/virtueller-rundgang>). Furthermore we want to add a room finder, in which the user can navigate to a specific room.

The target groups of the application are professors and students from abroad.

You can find our Trello board here:

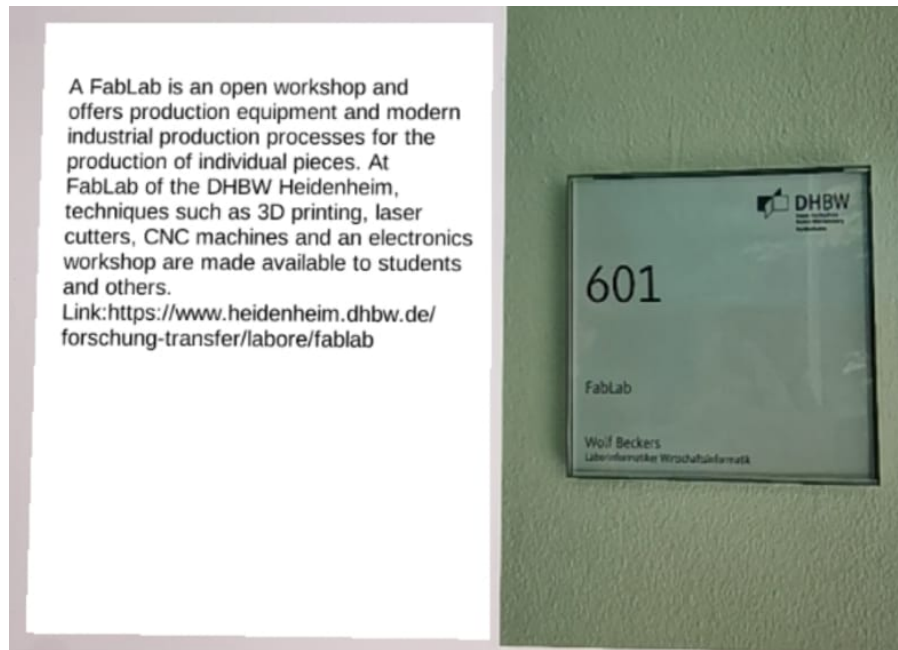
<https://trello.com/invite/b/15echR9z/cf2f9f653e156c0534cf4a5967ff1ac1/augmented-reality>

and our GitHub repository here: <https://github.com/DiegoMoVo/AR-Tour>.

## Implementation

In the finished application a script has been implemented that automatically adds the text to the textboxes from files. This way advanced features like loading text from a website can be implemented in the future. This also simplifies the process of updating the texts.

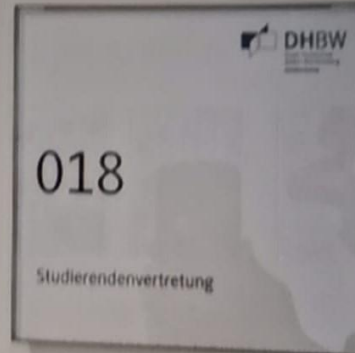
When a door sign is scanned a textbox appears and shows additional information like in the picture below.



On some door signs we also added pictures or picture galleries like on the door sign of the international office or the student council.



The Student Council (StuV)  
The student council has its own room, where they meet regularly. The StuV represents the students and listens to their concerns. In addition it organizes events such as the freshmen party, the bachelor prom, further education and university sport events. Every student can participate.  
Link: <http://stuv-heidenheim.de>



## Problems

1. A file in the Vuforia package was larger than the 500MB per file limit of Github. As a workaround the file was downloaded manually from [https://drive.google.com/file/d/1LNdl7Lk7tl3D2x1rOhV\\_5Rbkpa2Av0gX/view?usp=sharing](https://drive.google.com/file/d/1LNdl7Lk7tl3D2x1rOhV_5Rbkpa2Av0gX/view?usp=sharing)
2. In order to indicate from afar that a sign is scannable, we tried to attach a red marker to each sign. To do this, we installed the LAR: Locative Augmented Reality package in the first sprint. This was implemented and tested, but the problem was that there are signs on multiple floors and the package can only assign Longitude and Latitude GPS coordinates to the objects. The objects then appear at those coordinates, but the height of the objects is always the same as the user. Because we have objects on different floors, we can't distinguish which floor the objects are on. For this reason this idea was discarded
3. We wanted to use the LAR GPS package to implement a room finder. We used this on the sixth floor. Because everything is on a single floor the last problem does not apply. This can easily be extended to all other floors, except the ground floor because it has a different layout than the other floors. There are six intersections per floor and on every intersection an arrow is placed. This way the user sees at least two arrows at any time, and through them the user gets the hint where to go. They don't point to the door specifically, only to the passage where the door is located. The idea is that when the user is looking for a room, the implemented arrows point towards the room, they guide the user to the floor where the room is. However the GPS accuracy of the package is not good enough.

## Accessibility

Because the app is specifically for foreign exchange students and visiting professors, the entire app is in English. The app can be easily expanded to include additional languages as the texts are loaded with a script. No graphs are present in the app so colorblind people can use it without limitations.

## Outlook

In order to make the room markers and room finder work a better GPS package is needed. LAR was the online free package available. Additionally the features are only implemented for the ground, 6th and 7th floor. The app can still be extended to the other floors. Support for other languages has not been implemented, but the texts German texts are already available for easy implementation. Further accessibility options like reading out texts for people having trouble reading could also be considered. Finally the application can be merged with group 2.