

# PicGuide@TUM



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With its complex layout and numerous connections between buildings, navigating the TUM (Technische Universität München) campus can be overwhelming, particularly for new students unfamiliar with its layout. Current guiding tools often provide abstract representations of space but lack sufficient real-world cues to help users identify specific locations.

PicGuide@TUM aims to address this issue by incorporating real-world spatial context into a picture-guided map system. This system features real-world photos of key locations across the campus, aiding users in recognizing and navigating their way around the TUM campus.

## OBJECTIVE

The system aims to create a picture-guided map for the TUM campus with two components:

A web platform and a foldable brochure. The web platform offers routes with pictures, while the brochure provides detailed floor plans. Users scan markers on the floor plan using a mobile device's camera to view their route with pictures.

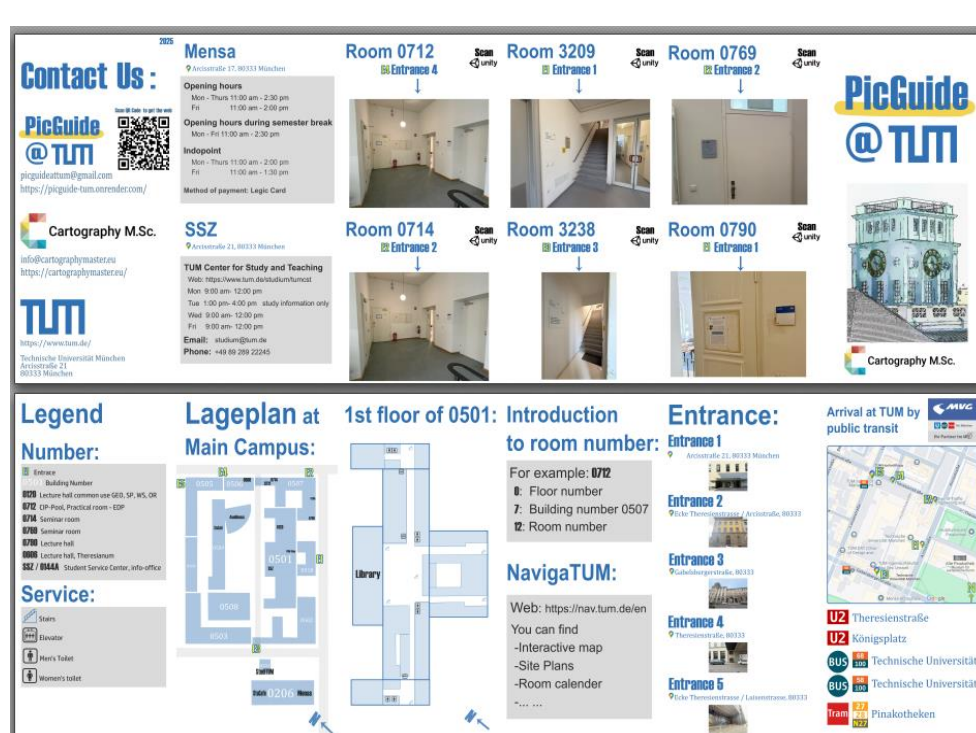


Fig.2. Brochure [3]



Fig.3. 3D Model

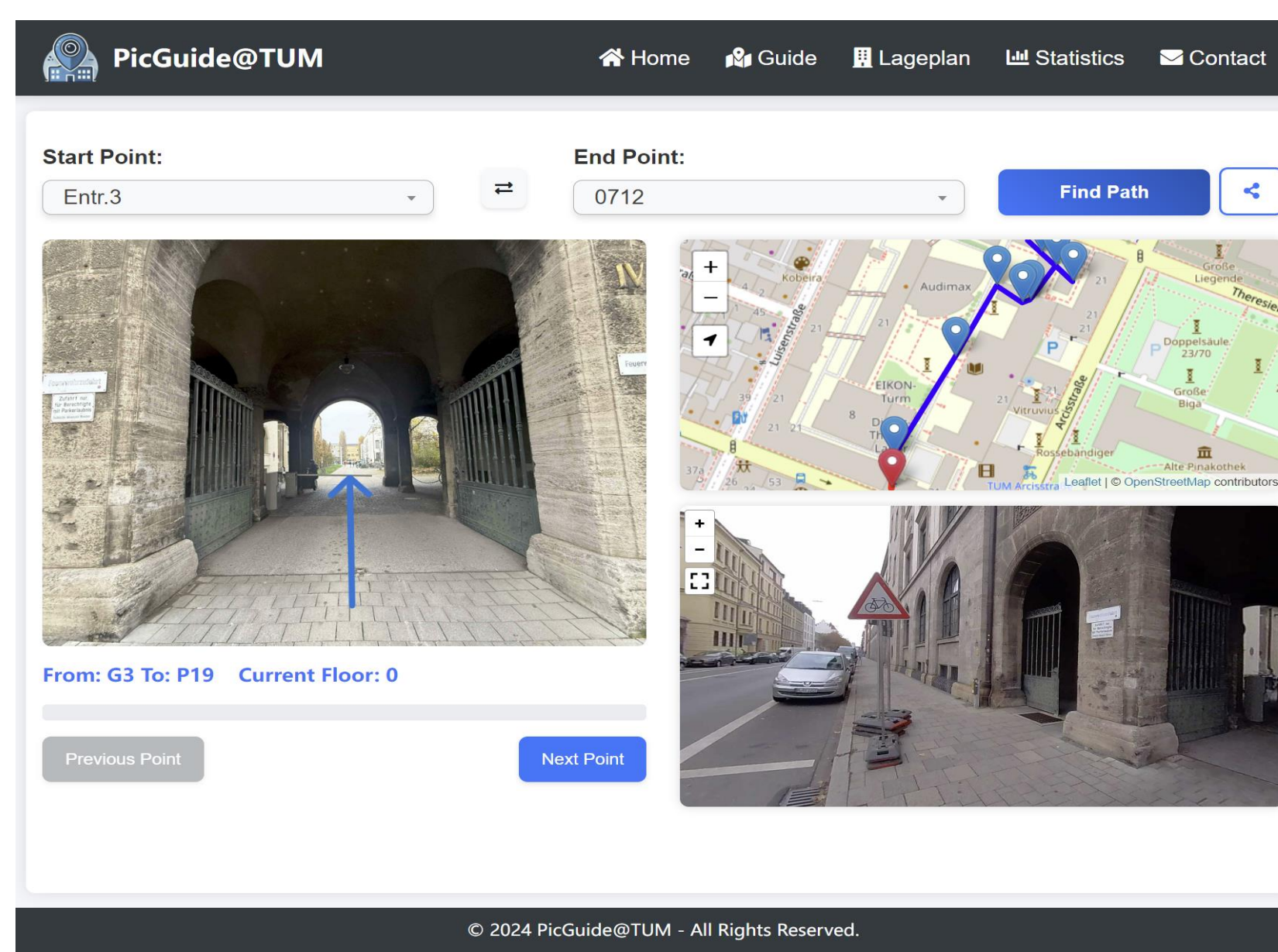


Fig.1. Guide page

## WORKFLOW

### 1. Data collection

Five primary entrance points of the TUM main building were selected as starting locations, while popular classrooms frequented by M.Sc. students in the Cartography program and key facilities were identified as destinations. Geotagged photos were captured along the routes connecting these points.

### 2. Web design & development

A static website was developed as the principal output[1]. Once the guide routes were calculated, they were programmed into the static website. Following the implementation of functionality, interactivity was incorporated[2].

### 3. Brochure design

A foldable brochure was designed to incorporate essential information such as transportation routes, campus layout, and key building entrances.

### 4a. model visualization

The 3D model of TUM has been reconstructed with data from Google Earth with the help of RenderDoc. It was put together with an 20cm resolution orthophoto as background from the Geodata portal. User can freely interact with the model with the model viewer by Sketchfab. VR is also supported!

## WORKFLOW

### 4b. AR integration

Augmented reality (AR) feature was integrated into the guide, enabling users to scan specific markers using an Android app for interactive, real-time guidance. This AR functionality, developed with Unity, provides contextually relevant information to aid navigation.

### 5. User Test

We tested the website's navigation with 25 participants, measuring task completion time. A post-test survey gathered feedback on user experience. Participants efficiently completed tasks and showed high satisfaction with the website's usability."

### 6. Web Platform Enhancement

3D models and floor plans were integrated into the website to enhance wayfinding. Cutting-edge technologies provided an intuitive navigation aid, helping users quickly find their way across the TUM campus.

## CONCLUSION

This project developed a comprehensive picture-guided map system for navigating the TUM campus. The web-based platform enhances traditional maps with visual aids like photos, aiding intuitive navigation and simplifying movements across the campus.

## IMPRINT

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## KEYWORDS

Picture guide, TUM, Campus, Panoramic, AR

## LINK

<https://picguide-tum.onrender.com/>



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