Exploring urban wayfinding from the lens of Pedestrians with Reduced Mobility – A Virtual Reality study

Problem description

Pedestrians with reduced mobility (PRM), encompassing a diverse array of individuals with distinct needs, often face navigational challenges arising from safety concerns and accessibility issues in urban environments. These challenges include various aspects, including road safety, access to key infrastructure such as toilets and ramps, as well as general comfort factors like noise and crowd density. While existing navigation aids (maps, tools, apps) predominantly rely on quantitative data for assessing accessibility, they are currently unable to provide route planning and guidance that allows PRM to make informed decisions, navigate effectively, and interact with urban environments with comfort. This project addresses this by investigating urban wayfinding experiences from the perspective of PRM using Virtual Reality. The project seeks to gain profound insights into the challenges faced by PRM in navigating urban environments through the immersive and realistic environment provided by Virtual Reality. The objective is to contribute to the development of more user-centric and inclusive navigation solutions that go beyond standard accessibility metrics. The outcomes of this study can potentially contribute to the development of a routing app that aims to provide safe and friendly routing options, with features co-designed to meet future users' needs.

Assignment

- Conduct a literature review of state-of-the-art research on urban navigation for PRM
- Design and conduct a VR experiment with target groups to collect data on their navigation experience in various urban environments
- Analyze the data to derive insights into participants' experiences and derive key metrics to ensure safe and comfortable navigation of PRM in urban environments, as well as input for a routing app's features, layers, and overall structure.
- Writing a thesis report (and optionally a scientific paper for an international journal).
- This Master's thesis includes an internship at Future Mobility Network.

Candidate

- Knowledge and interest in wayfinding behavior, inclusive mobility solution design
- Successfully completed the eXtended Reality for Civil Engineering course (CIEM6304) or have experience in VR or willingness to learn VR
- Basic data analysis skills

Research Group

The Mobility in eXtended Reality (MXR) Lab, Transport & Planning department
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