Visuo-Locomotive Perception / Experiment Data Analysis Experiment 1 / Auditory vs No Auditory Aids Experiment 2 / Auditory + Visual Cues (90° & 60°- 45°)



Data of 9 subjects considered as valid



Female / Male Ratio



Experimental Procedure

- 1. Introduction and general information about wayfinding + orientation task experiment (20-25min)
- 2. Pre-questionnaire
- 3. Introduction to VR equipment and its usage test room play
- 4. Oral instructions
- 5. Beginning of the VR experience / experiment
- 6. 3 orientation tasks during the immersive experience
- 7. Final point questionnaire
- 8. Post questionnaire

The degree of using the landmarks affect the navigation performance of a user. It helps in updating the spatial orientation. Participants in virtual loci with the auditory cues should perform better in spatial updates and therefore they should have a better performance in the orientation tasks. An integration of both auditory and visual cues could assist in facile wayfinding process.

The way finding performance of participants in the vr environment where landmarks are positioned vertically to the path of a user will be preferable to landmarks situated in an angle between 45° - 60° in relation to the user's path. Gathered Data /

Orientation Tasks Screen Recording External Recording Pre/Post Questionnaire Head Tracking 4-dimensional data Sketch Map Screen Recordings / Two Floorplans



External Recordings / side to side



3 orientation tasks asked participants during the virtual reality tour

3 orientation tasks asked participants during the virtual reality tour



3 orientation tasks asked participants during the virtual reality tour



Task No. 2

3 orientation tasks asked participants during the virtual reality tour



Post-Questionnaire/

How many turns did you make?



How many times did you see green elevators?





■ did you see it ■ was it helpful

Did you hear the sound of green elevators? Was it helpful?



How many times did you see the highway?



participant

Did you hear the highway bridge? Was it helpful?



■ did you see it ■ was it helpful



■ did you see it ■ was it helpful

Direction of the elevators. How confident are you? (1-5)



Direction of the church. How confident are you? (1-5)



Direction of the starting point. How confident are you? (1-5)



Was the task hard, kind of hard, not so easy or easy? (1-4)



Sketch Maps/











r____







Head Tracking Data / Visualization

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7.72 (-13.665, 1.040, -19.720) (.000, .713, .000, -.701)

Orientation Tasks / Limitations

- Participants may have understood a corridor direction towards the starting point
- Sound was distractive and confusing for some participants
- Cable tangled around may have disrupted the orientation

Oral Instructions / Limitations

majority of participants found oral instructions overloading their memory.

- Information hard to process or understand
- Too many instructions regarding the visual cues as well as the path to be made
- Oral instructions were not clear to all participants examiner's recitation
- Participants asked for oral instruction repetition during the experimental task
- Indication of the signage led to confusion during the walk

Floorplan layout / Limitations

- Some participants could not find their way. 2 subjects did not complete their tasks successfully.
- Signage was misleading
- 3d elements were out of scale
- "abandoned hospital"
- Floorplans should vary
- Higher level of details

Future Application / Development

- 3d sound exploration sound acoustics
- Immersive spaces
- Games
- Architecture prototyping