

Validation of a VR evacuation experiment - behavior, decision-making and eye movement

Virtual Reality (VR) is an increasingly popular tool to use for evacuation research. The benefits of this technique are several, for example, it is cost-efficient and gives the researcher a high level of control regarding the perceived environment in the experiments. The tool has shown to be promising in previous validation studies. However, detailed such studies are still lacking.

Purpose

The purpose of the project is:

- to study how well evacuation experiments in VR can reproduce the results of a corresponding field study regarding several factors, e.g., decision-making and eye movement,
- to learn how evacuation experiments, in the field and in VR, can be designed to suit as future validation cases.

Method

The study was performed using unannounced evacuation experiments in VR, within a setting designed as a copy of a previously performed field study. Eye-Tracking equipment was used to compare eye movement between the studies. Two different scenarios were studied, which were replicas of two scenarios in the field study (which included three scenarios in total).

Both the VR- and the field experiment was performed on the 16th floor of a building (virtual and real) where evacuation elevators was one of the two escape routes.

Resultat

The study shows that similar results was collected in regard to exit choice in the field and the VR experiments. Also, walking paths and the perception of evacuation signage was similar in the experiments. However, more participants focused their gaze on some of the evacuation signs in the VR study.

The Eye-Tracking equipment used in both experiments increased the number of factors that could be studied within the validation study. This is deemed to be an interesting tool for such studies and it should therefore be further incorporated in future validation studies of VR. However, when comparing the data from these experiments, different manufacturers for the equipment were used, which lead to some manual post-processing of the collected data. There were also certain differences in the collection of the data, which lead to difficulties in the comparisons. Thus, this study concludes that when using this technique for validation purposes, it is important to identify what data that is to be collected and how this data is recorded.

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