

Pedestrian trajectories on a 90° turn in a corridor: A non-immersive virtual reality study.
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Abstract

When an emergency occurs, bottlenecks can emerge at the corners of corridors. Therefore, it is essential to understand how people move through complex geometries during evacuation to improve architectural designs. Virtual Reality (VR) is a versatile tool used for evacuation research since it allows to replicate evacuation routes easily, with high levels of experimental control. These advantages are helpful to study pedestrian trajectories, which are particularly crucial in the context of emergency situations. Nevertheless, validation efforts are still ongoing. Therefore, comparing results in laboratory experiments to the outputs in Virtual Reality experiments is a way to study the validity of the VR research method.

The present project replicates in a non-immersive Virtual Reality experiment referred to as Single VR experiment, a laboratory experiment by Keip & Ries (2009). People walked alone through a corridor with a 90° turn. Additionally, a second VR experiment (Multi VR experiment) examined how the presence of virtual agents (VA) in the virtual environment (VE) could influence individuals' travel path.

The trajectories obtained by Keip & Ries (2009) and the Single VR experiment were compared. The results showed certain similarities between both experiments concerning the travel path pattern. Differences were also identified, as individuals were more prone to walk closer to the inner wall after the corner in the Laboratory experiment. Furthermore, signs of social influence were difficult to observe in the Multi VR experiment.