

## **The Experience of Redirected Walking in Small Tracking Spaces**

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### **Abstract:**

Real walking has users walk in a physical space as they move through a virtual environment. It increases immersion, improves navigation and is often preferred by users. However, the physical space that users can walk in is limited. Redirected walking is a group of techniques that keep users inside a small physical space while they explore larger virtual environments by walking. Gain manipulation changes how the user's viewpoint is moved. For example, the user might turn at a different rate in the virtual environment than they are physically turning - rotation gain. Environment manipulation changes the virtual environment itself - for example an expanding room. Redirected walking algorithms combine different techniques together to keep users inside the tracking space.

This presentation explores three contributions to the field of redirected walking. First, generalised redirected walking algorithms are compared in a small physical tracking space of 3.5 x 3.5m with a focus on user experience. In such small tracking spaces, the simplest redirected walking algorithm was preferred by users while having similar performance to the more complex redirected walking algorithms. Next, the rotation accuracy of users under different levels of rotation gain was measured. Users had variable responses to the rotation gain and the number of visual cues in the environment impacted rotation accuracy. Finally, a promising new redirected walking technique is presented – Segment Addition. Segment Addition uses change blindness to add slices to the environment as the user turns. This causes the user to change the amount they are turning in both the virtual and physical space. An exploratory user study on Segment addition suggests that large changes can be made to the virtual environment while the user perceives the environment as comfortable, useable and natural.