



Investigating the Influence of Locomotion Methods in Virtual Reality on Spatial Orientation and Perspective Taking

Open Bachelor/Master Thesis

Background

For many jobs (e.g., engineers) it is quite important to have good spatial abilities. Nevertheless, as we are all human, not everyone has perfect abilities. Paper, desktop computers, and virtual reality-based tests exist that measure spatial abilities. As virtual environments can be larger than the physical available space, several locomotion methods (e.g., walking, teleport) were developed over the years. It should be evaluated if they have an influence on spatial orientation and perspective-taking in virtual environments and if there are differences between the locomotion techniques.

Research Goal

The aim of this thesis is to create a game engine based virtual reality application and compare with it in a study several locomotion metaphors regarding their influence on spatial orientation and perspective-taking. These findings should be correlated with the spatial abilities of the study participants. The implemented locomotion metaphors should be selected based on a proper classification as well as findings from related work.

Based on bachelor/master level the scope is adapted.

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Initial Related Work

Dünser, A., Steinbügl, K., Kaufmann, H., & Glück, J. (2006, July). Virtual and augmented reality as spatial ability training tools. In *Proceedings of the 7th ACM SIGCHI New Zealand chapter's international conference on Computer-human interaction: design centered HCI* (pp. 125-132). ACM.

Waller, D. (2005). The WALKABOUT: Using virtual environments to assess large-scale spatial abilities. *Computers in human behavior*, 21(2), 243-253.

Marsh, W. E., Kelly, J. W., Dark, V. J., & Oliver, J. H. (2013). Cognitive demands of semi-natural virtual locomotion. *Presence: Teleoperators and Virtual Environments*, 22(3), 216-234.