

Abstract

This diploma thesis focuses on locomotion methods in virtual reality, specifically on their effect on navigational abilities and spatial memory. In the theoretical part of this thesis firstly the topic of navigation, spatial memory, optic flow, spatial scale, virtual reality, and locomotion methods in virtual reality are described. In the empirical part, an experiment is presented. In this experiment, we studied two locomotion methods – Teleportation and Teleportation with optic flow, and their effect on navigation and spatial memory. We also examined the effect of spatial properties on these abilities – two sizes of environments were compared – small and large and also two types of complexity of environments – vista spaces and environmental spaces. The experiment had two parts, in the first part participants were looking for various objects and in the second part they were tasked to point at these object's locations with one reference point. Results showed significant differences in navigation duration and pointing duration between the examined locomotion methods – Teleportation with optic was faster. However, the effect of the locomotion method was not shown in the pointing accuracy and navigated distance. Also, no significant difference was found in cybersickness between the two LMs. Participants also navigated faster in vista environments than in environmental environments and they also pointed more accurately. The environmental size did not seem to affect the pointing accuracy, but participants pointed faster in small environments.

Keywords: virtual reality, locomotion methods, spatial memory, navigation, optic flow

