

The analysis on potential of environmental perception in system of virtual reality based on elements of visual perception

MohammadSadegh TaherToloudel¹, Esmaeil Zarghami², Sina Kamali Tabrizi³, Omid Heydaripour⁴

Submitted: 2019-05-13

Accepted: 2019-09-04

Abstract

The technology of virtual reality provides the user by an environment so that he can exercise new experience of presence in the environment by simulation of direct perception. This technology was introduced as an amusement tool into the digital world for the first time. Display monitor of this technology does not result from a simple phenomenon, but it is a monitor equipped with some sensors that operate as tracking devices and send some data about the location of user and also the direction of user's vision to computer. Individuals experience virtual environments with respect to potentials of platform or hardware, with different appearances. The hardware of virtual environment could be a simple object i.e. a mobile phone and a pair of virtual reality eyeglasses; and or it could be a complex one including cloth-wearing equipment and computer that enables the user to move in the physical environment. Nowadays, most immersion process in virtual environments is mainly focused on using Head Mounted Display (HMD) that is well-known as virtual reality eyeglasses in the market. A pair of virtual reality eyeglasses include a hood or headwear composing of LCD monitor that places at the front of eyes to present the user a stereoscopic view, produced by computer. The stereoscopic view is related to a process in which two photos are taken from the same object with a slight difference in viewpoint; and then they are seen together which provides an image with depth and stability of the environment. The environmental perception is deemed as one of the key topics concerning human-environment relationship at macro and micro levels; and with respect to ever-increasing development for using virtual reality technology, review of addressee's perception by this technology might be vitally important in improving the use of this technology in various sciences and particularly in the architectural field. Accordingly, the present research aims to analyze the potential for environmental perception in virtual reality system by comparative analysis and on environmental perception both directly and through utilization of technology of virtual reality, and also based on the assessment of visual perception components in a process. The methodology of this study is of the empirical-surveying type so that the addressee's have looked at space and surveyed it by direct technique and wearing of virtual reality eyeglasses at a time. Given the specialized nature of this investigation for analysis of virtual reality elements, the statistical population of this study was selected from students of architectural disciplines. The reliability of the questionnaire was confirmed according to Cranach alpha coefficient and content validity was also approved by the comments of experts. Finally, based research variables, and according to various levels and dimensions of conception, two comparative models were conceptualized among direct visual perception and visual perception through the technology of virtual reality and also were explained based on surveying data by LISREL software.

Keyword: Virtual Reality, Virtual environment, Environmental Perception, Visual Perception, Visual Environment, 360Degree Video Panorama

¹ Associate professor, Academic board of the department of architecture, faculty of architectural engineering and urbanism, University of ShahidRajaei

² Full Professor as a Member of Architecture Group, Faculty of Architectural Engineering and Urban Design, Shahid Rajaei Teacher Training University

³ Ph.D. student, Department of architecture, faculty of architectural engineering and urbanism, University of ShahidRajaei

⁴ PhD Student, Faculty of Architectural Engineering and Urban Design, Shahid Rajaei Teacher Training University