

## Using Virtual Reality in Slideshow Presentations

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### Abstract:

Presentation software, such as PowerPoint, has become standard in several application domains. It is used in different environments of the everyday life, such as work, home or education institutions and supports communicating information. Such software already supports different established digital resources, such as text, images, sound and video. Virtual Reality (VR) is not among these established means, despite the fact that head-mounted displays (HMDs) for VR become affordable and applicable concerning the costs and the ease of use. Therefore, VR is no longer reserved for expert use, but becomes more and more a part of daily life of the general public.

VR has the potential to be a valuable resource within presentations. Still, there exist challenges that must be considered before using VR among other resources in slideshow presentations. One of them is related to the involvement of a presenter within a VR system. The audience takes the active part of a VR mediated presentation and uses HMDs to experience the virtual content. However, presenters still need basic controls over the presentation procedure (e.g. switch to next/previous slides) to comply with fundamental constraints, such as time limitations. It also must be ensured that presenters can communicate with their audience despite the restrictive VR technology. Another challenge relates to the technical integration of this technology in common presentation software. How can a switch from a common PowerPoint slide to a VR experience be realized?

In this paper, we investigate how modern game-engine-based VR can technically be integrated in slideshow presentations that rely on presentation software. We discuss two different concepts to include both slides and VR technology in one presentation. The first concept is *mixed presentation* where a switch takes place between a virtual environment and conventional 2D slide presentation in reality. The second is *virtual presentation* where slides are adopted within a virtual environment. Furthermore, we examine the role of the presenter in a scenario where VR is applied in a presentation-like way. We conducted three user studies to draw conclusions about the presentation concepts and different involvements of presenters. Our study shows that it is not necessary that presentations need to be held completely in VR as both virtual and mixed presentations were accepted by our participants.

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