



Figure 6: *Level 1 - Medium:* Additionally to Level 0, the lights are dimmed while spots point to the display.



Figure 7: *Level 2 - Obtrusive:* Finally, a cage is added to block access to the shelves.

tic, or fantastic) allows for the investigation of different types of immersive notifications. Systematic research in this direction, informed by past results on mobile, desktop, wearable and ambient notification in real environments, could lead to the derivation of general guidelines. These will help developers to find, design and integrate appropriate notifications in future VR applications more easily and might lead to a higher prominence of the concept in general.

Conclusion

We introduced our approach of immersive notifications for VR. Our method is motivated by the unsatisfying state-of-the-art approach of displaying generic notification pop-ups that do not adapt to the experienced IVE, implemented in current VR systems. To maintain the feeling of presence, our method aims to preserve plausibility when providing the user with real-world information. We propose to notify immersed users with plausible animations and interactions in the IVE, that adapt to i) the general setting of the virtual world (i.e. aesthetics, story, environment) and ii) the current context of the immersed user (i.e. how engaging the user's virtual situation is). We provide the concept of a framework to include immersive notifications of incoming real-world messages in VR applications. In addition, we describe our open-source implementation of it, available for the Unity engine, exemplarily showcase a basic VR messaging system based on it, and discuss several examples of plausible and adaptive VR notifications. Finally, we outline starting points for follow-up research to evaluate our method, provide ideas of meaningful future framework extensions and discuss where further research on this topic can lead.

Acknowledgements

This project has received funding from the EU's Horizon 2020 research and innovation programme, under the Marie Skłodowska-Curie grant agreement No 642841 (DISTRO).

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