

Proposal of a virtual room using MR technology and research on its effectiveness

Sou MURAKAMI^{1*}, Kazuya SHIDE²

¹ Master Course, Graduate School of Science and Technology, Shibaura Institute of Technology, E-mail address: mj23157@shibaura-it.ac.jp

² Prof., School of Architecture, Shibaura Institute of Technology, Dr.Eng, Japan, E-mail address: shide@shibaura-it.ac.jp

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1. INTRODUCTION

In recent years, the field of "virtual architecture" has been attracting attention. Room space constructed on VR space allows various spatial expressions that are not bound by the constraints of reality, but when working with real objects, switching between reality and virtual space can cause a loss of immersion. Therefore, in this study, we created an application with this function and verified the effect of the application for the purpose of coexistence of the experience of virtual architecture and work in reality.

2. LITERATURE REVIEW

Projection mapping is a method of expression that is not possible in the original room space. In their research, Oguri et al. [1] found a new way to create a Japanese-style room space by using projection mapping technology on the fittings and hanging scrolls of a Japanese-style room. However, the cost of equipment and installation work is high, and the projection locations are fixed and lack flexibility. We believe that MR is a good way to construct an environment with the same functionality but with more flexibility, and we decided to use MR in this study.

3. RESEARCH METHOD

An application that can be handled by HoloLens2 was created using Unity based on the BIM model created at the time of construction completion. By projecting the BIM model into a real room using MR, various makeovers were made possible on MR without modifying the real building. Experiments were conducted to see if this kind of spatial representation was acceptable to the users of the application, and what kind of psychological changes occurred as a result of using the application.

4. CONCLUSION

The analysis was based on questionnaires before and after the experiment. The results showed that in architectural spaces created with MR, both spatial experience and work are possible. In addition, it was not confirmed that any discomfort occurred in the MR-based space, and the results significantly indicated that a positive mood change occurred before and after use.

REFERENCES

[1] M. Oguri et al., "A New Method of Spatial Effect to Japanese-style Room by Shoji Projection Mapping", The Journal of the Society for Art and Science, Vol. 19, No. 5, 2020