**Project Specification Report**

Project Title: Virtual Reality Questionnaire Toolkit: Examining Interaction Techniques for Doing Questionnaires in VR

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**Project Introduction**

As the development of the Virtual Reality (VR) technology, head-mounted displays (HMD) are becoming popularity. VR has since been applied to many areas such as computer graphics, gaming, or education [1], [2] and during 2020 fourth quarter alone there were over one million Quest 2 units sold worldwide [3]. Questionnaire is one way to evaluate the application which allows product owner or developer to understand its upsides and downsides like measuring presence or immersion from the questionnaire result.

Despite paper questionnaire is a way to evaluate most current application or production. However, traditional appraisal methods have inadequacy. Putze Susanne et al. describes the ﻿switching between VR and physical reality leads to a break in presence [3] ﻿that might alter the outcomes [4]. Embedding question items in the VE offers a way to stay closer to the context of an ongoing experience[5], Putze Susanne et al. [3] ﻿show evidence that in virtual reality questionnaire (VRQ) are less invasive than out VRQ.

In this project I propose Virtual Reality Questionnaire Toolkit (VRQTK), a tool enable questionnaire to be the part of the VR experience and interact with the user and virtual environment (VE) and exploring a suitable VRQTK in VE.

**Methodology**

This project will first do a literature review on the research conducted on the area of VRQ and focus on design and experimental process. (still working…)

**Experimental plan**

(still working…)

**Project objectives**

The literature review, understand the theory, analysis, and comparison of various questionnaires strategies of existed work will be at the end of this semester. And at the beginning of next semester, a detailed comparison will be conducted to get a comparatively optimized method. (still working…)

**Project deliverable**

1. A summarized report about design a suitable questionnaire for decrease break in presence in virtual reality.
2. A complete virtual reality questionnaire plugin which can apply in different virtual reality environment.

[1] J. Pirker, A. Dengel, M. Holly, and S. Safikhani, “Virtual Reality in Computer Science Education: A Systematic Review,” *Proc. ACM Symp. Virtual Real. Softw. Technol. VRST*, 2020, doi: 10.1145/3385956.3418947.

[2] X. Guo, X. Chen, X. Feng, and S. Zheng, “The Enlightenment of ‘aR / VR’ Technical University Course Education in Taiwan, China,” *ACM Int. Conf. Proceeding Ser.*, pp. 22–28, 2020, doi: 10.1145/3439133.3439146.

[3] S. Putze, D. Alexandrovsky, F. Putze, S. Höffner, J. D. Smeddinck, and R. Malaka, “Breaking the Experience: Effects of Questionnaires in VR User Studies,” *Conf. Hum. Factors Comput. Syst. - Proc.*, pp. 1–15, 2020, doi: 10.1145/3313831.3376144.

[4] V. Schwind, P. Knierim, N. Haas, and N. Henze, “Using presence questionnaires in virtual reality,” *Conf. Hum. Factors Comput. Syst. - Proc.*, pp. 1–12, 2019, doi: 10.1145/3290605.3300590.

[5] D. Alexandrovsky *et al.*, “Examining Design Choices of Questionnaires in VR User Studies,” *Conf. Hum. Factors Comput. Syst. - Proc.*, pp. 1–21, 2020, doi: 10.1145/3313831.3376260.

[6] Aslop. (2021, Sep. 8) *Oculus Quest 2 Headset Unit Sales Worldwide From 2020 To. 2021* [Online]. Available:

<https://www.statista.com/statistics/1249850/oculus-quest-2-units-sold-by-quarter/>