

USER EXPERIENCE IN SOCIAL VIRTUAL REALITY

Exploring methodologies for evaluating user experience in social virtual reality

INTRODUCTION

Social VR technology allows users separated in space to interact with virtual representations of other people in shared virtual environments. Currently there are no systematic evaluation methodologies for social VR user experience.

This research based graduation assignment is part of the EU-funded project VRTogether. Centrum Wiskunde & Informatica (CWI) is one of the participants in this project. This graduation assignment addresses one of the tasks of CWI – understanding the user experience in social VR.

Based on literature review and user studies, three important dimensions of experience were identified: 1) Quality of interaction, 2) Social meaning and 3) Presence and immersion. An evaluation methodology was designed to evaluate the three dimensions of experience. This methodology was used in an experiment to evaluate the user experience of social VR, which was also compared with a Face-to-face conditions and a Skype condition. Advantages and disadvantages of social VR were identified, and design recommendations were proposed.



EVALUATION

An experiment was designed, based on a specific scenario: photo sharing between two friends. The evaluation methodology (a questionnaire and an interview) was used to evaluate the user experience in three conditions: Face-to-face, Skype and Social VR. (setup shown in Fig 1)

26 pairs of participants who know each other joined the experiment. Results indicated that social VR provides good experience of social meaning and presence/immersion. But the quality of interaction need to be improved.

OUTCOMES

Based on literature review, a common ground understanding of social VR user experience was created, shown in Fig 2.

Based on the experiment results, the evaluation methodology for each dimension of experience was improved and provided. Apart from that, design recommendations for future social VR product were proposed.

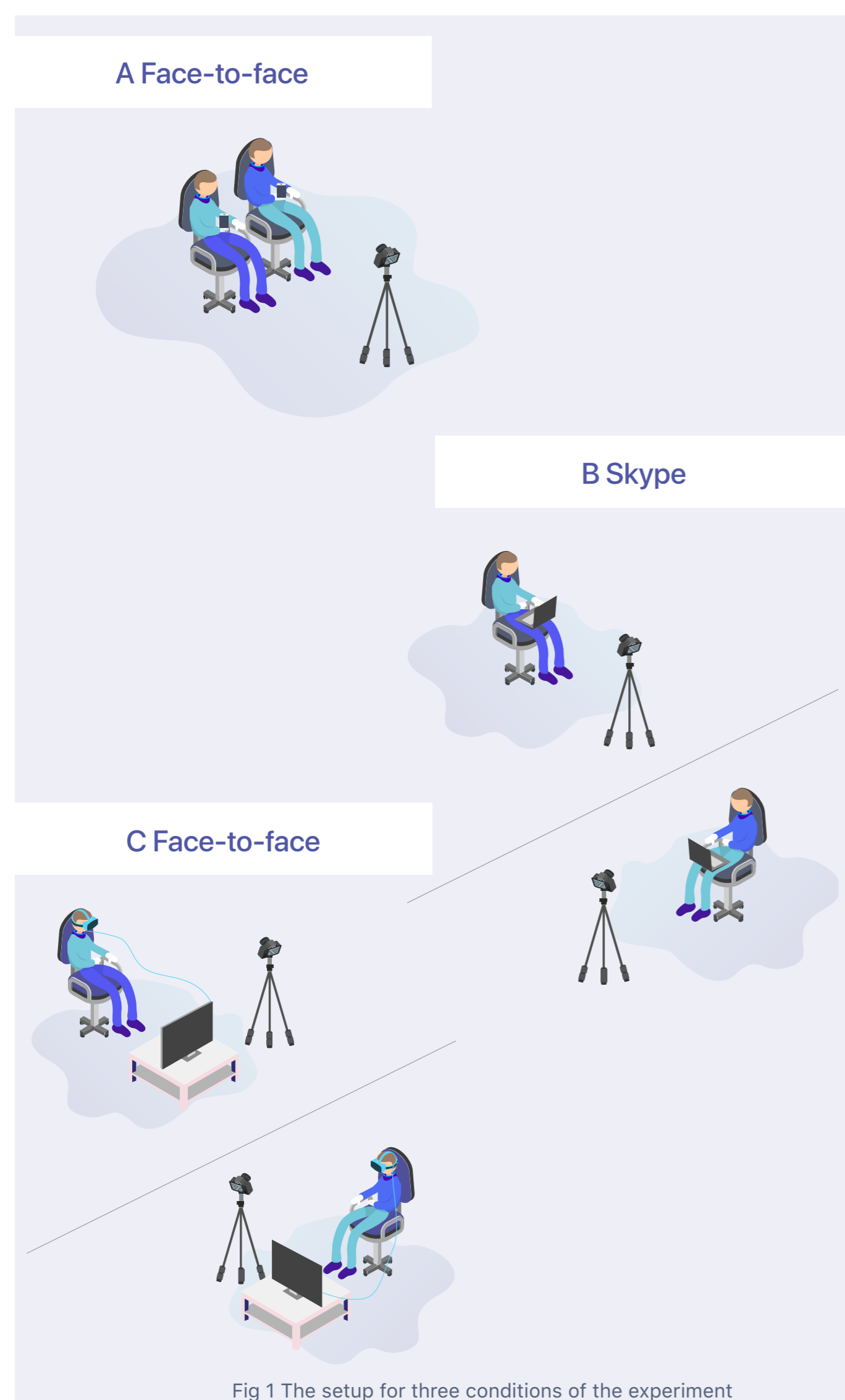
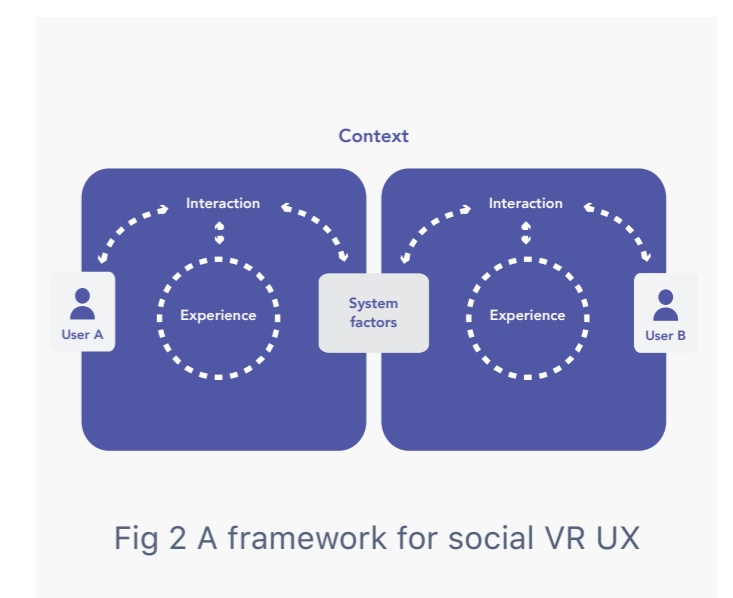


Fig 1 The setup for three conditions of the experiment

DIMENSIONS OF USER EXPERIENCE

Quality of interaction	Social meaning	Presence & immersion
Evaluation questionnaire	Evaluation questionnaire	Evaluation questionnaire
<p>The scale of the following questions are from 1 to 5, representing the following meanings:</p> <p>1 Strongly disagree 2 Disagree 3 Neutral 4 Agree 5 Strongly agree</p> <p>1. "I was able to feel my partner's emotion during the VR photo sharing." <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5</p> <p>2. "I was sure that my partner often felt my emotion." <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5</p> <p>3. "I was able to really feel when my partner was talking about..." <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5</p> <p>4. "I could really feel when my partner was talking about..." <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5</p> <p>5. "I could really understand what my partner was talking about..." <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5</p> <p>6. "I was sure that my partner understood what I was talking about..." <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5</p> <p>7. "I could share emotion to my partner..." <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5</p> <p>8. "Through the VR photo sharing, I managed to share my emotion with my partner..." <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5</p>	<p>Strongly disagree 1 2 3 4 5 Strongly agree</p> <p>10. "I often felt as if I was all alone during the VR photo sharing." <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5</p> <p>11. "I felt my partner often left alone during the VR photo sharing." <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5</p> <p>12. "I detected little satisfaction from photo sharing with my partner..." <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5</p> <p>13. "The photo sharing experience with my partner felt awkward..." <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5</p> <p>14. "I couldn't think of anything to say to my partner..." <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5</p> <p>15. "When sharing the photos I was surprised to go by very slowly..." <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5</p>	<p>Strongly disagree 1 2 3 4 5 Strongly agree</p> <p>16. "In the virtual world, I had a sense of being there..." <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5</p> <p>17. "Sometimes I felt that the virtual world was surrounding me and my partner..." <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5</p> <p>18. "I often felt my partner and I were sitting together in the same place..." <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5</p> <p>19. "I felt that the photo sharing experience in VR enhanced our closeness..." <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5</p> <p>20. "The sense of sitting in the virtual space, rather than operating something from outside..." <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5</p> <p>21. "My VR photo sharing experience seemed as if it was a true-to-life sharing..." <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5</p> <p>22. "I did not realize what was happening around me in the real world..." <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5</p> <p>23. "I felt detached from the outside world during the VR photo sharing..." <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5</p> <p>24. "At the time, I was focusing totally on the photo sharing..." <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5</p>
Experiment result	Experiment result	Experiment result
<p>Fig 6 Mean scores of quality of interaction</p>	<p>Fig 7 Mean scores of social meaning</p>	<p>Fig 8 Mean scores of presence & immersion</p>
Recommendations	Recommendations	Recommendations
<ol style="list-style-type: none"> Smart gesture recognition Augmented social interaction Safety- restrictions 	<ol style="list-style-type: none"> Design for close relationships Provide social values Enrich social context Balance between virtual and real world 	<ol style="list-style-type: none"> Non-realistic activities High quality image and low delay Better rendering Comfortable HMD

Yiping Kong
User experience in social virtual reality
29/08/2018
MSc Design for Interaction

Committee Prof. dr. Ridder, H. de
Pablo Cesar
Jie Li
Company Centrum Wiskunde & Informatica

