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A Comparative Study on a Virtual 3d Context on the Video Collaborative Virtual Environment in Celebrity Quotes, Dream House and Desert Survival Game

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Abstract – Collaborative Virtual Environment (CVE) ideas have been utilized in numerous devices in the past couple of years. Use of technology range that is from army fighting simulations to different civilian industrial uses the goal of the analysis is actually analyzing the outcome of 3 dimensional (3D) virtual environment and augmented reality apps. The overarching goal of the tests discussed in this specific thesis was investigating whether individuals collaborating in video CVEs feel and behave much more similarly to being face-to-face compared to individuals collaborating through regular video conferencing tools.

Keywords: Video, Virtual, Conference, Communication, Environment.

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1. INTRODUCTION

The objective of real time telecommunication media is collapsing the area between geographically dispersed groups and makes the impression that individuals are in concert, when in reality they're not. Contemporary video conferencing engineering offers to provide such an illusion, frequently heralding video mediated correspondence (VMC) to be the next most sensible thing to being face-to-face. This particular claim appears not very farfetched if a person considers the benefit of having the ability to see the facial expressions of the other individual throughout video interactions that are lacking in regular phone calls. In comparison to being face-to-face, nonetheless, even VMC still seems detached, cumbersome, artificial, and distant. A shortcoming of widespread video collaboration which contributes to this perception would be that the 3D context among individuals and the shared workspace of theirs provided in face-to-face effort is lost. It's thus not easy for participants to tell through the video what others are actually looking at, what they're doing, or even just who they're speaking to? most of which could result in trouble for coordinating the collaborative pursuits of theirs.

Video Collaborative Virtual Environments (video CVEs) are actually novel VMC interfaces which address these issues by re introducing a virtual 3D context into which distant customers are psychologically transported to be collectively and meet up with the earth and with one another. Even though working prototypes of video CVEs have demonstrated the specialized feasibility of theirs, exploration into the importance of video CVEs to allow for remote collaboration is still in the infancy of its, as well as the human elements involved aren't properly understood.

2. COLLABORATIVE VIRTUAL ENVIRONMENTS

Collaborative Virtual Environments (CVEs) are actually computer enabled, distributed virtual spaces or maybe locations in which individuals are able to connect as well as meet up with others, with agents and with virtual items. CVEs differ significantly in the representational richness of theirs from 3D virtual reality to 2D as well as text based environments. The primary uses to date have been industrial and military staff training, collaborative style as well as engineering, and multiplayer games.

The CVEs engineering aims at transforming the web networks in 3D navigable as well as populated spaces which let the job of cooperation and also the interpersonal play; however, the usage of CVEs creates a mediatization of the effort; which would mean we pass out of a genuine scenario face to face to a situation just where we are using a virtual world synthetically produced by computer programs to come together. Regrettably, frequently this new means of dealing degrades among owners some

info essential to the collaborative process, this includes the following.

i. The actions of the partner.

ii. The intentions of the partner.

iii. The point of view of the partner.

The style of a CVE is regarded now as an actual challenge. The troubles are many and also have a technological, cognitive, and social character clearly coupled.

3. DESERT SURVIVAL GAME

The primary objective of the Desert Survival Game experiment discussed in this specific chapter was exploring the utility of several very subjective rating scales for comparisons between regular video conferencing methods and video CVEs, enabling conclusions to be drawn about which of them afforded a user experience which was a lot more much like being face-to-face.

Experiment design

The study was created as well as conducted as a joint effort between the writer as well as members of the Multi Media Systems Research Laboratory (MSRL)

Participants

Forty-two subjects (thirty six male and six female) participated in the experiment. In fourteen sessions, every one of the 3 participants of a team took part in 3 trials, providing a total of 126 trials. The age of the participants ranged from nineteen to sixty three ninety seven years (median age thirty three years). They'd no prior knowledge of the experiment besides that the aim was comparing video conferencing methods.

Data analysis

Social presence as quality of the medium

The mean values as well as common mistakes of social presence evaluated from the semantic differential scales. There seemed to be a major primary impact of Medium, $F(2,52)=81.9$, $p < 0.001$. Post-hoc pair wise comparisons in addition discovered that social presence of FtF ($M=6.0$, $SD=0.75$) was rated considerably greater compared to vCVE ($M=4.5$, $SD=1.1$, $p < 0.001$) as well as sVC ($M=3.9$, $SD=1.0$, $p < 0.001$). Social presence of vCVE was furthermore rated considerably greater compared to social presence of sVC ($p=0.023$).

4. DREAM HOUSE

The experiment Dream House, provided in this specific chapter, was created to take a look at the repeatability of this particular result in a comparative study including the very same kind of interfaces, but making use of an alternative kind of collaborative task. Based on the original result, the primary hypothesis to be tested was consequently much more specific: that social presence of video CVEs is actually perceived to be higher compared to social presence of a regular video conferencing interface, and hence that effort in video CVEs feels much more like being face-to-face

Experiment design

This experiment was once again a joint effort of the writer as well as members of the Multi Media Systems Research Laboratory (MSRL). The following areas just provide the goals as well as results which were of interest to our research. The experiment followed a within subjects design with 2 conditions. Participants worked on a certain task of groups of 3, in which one participant was an experimenter that took on the more passive job of a moderator.

Participants

Thirty-six volunteers (twenty six male and ten female) were recruited primarily for that experiment. 18 sessions had been done where 2 subjects participated in 2 trials which gave a total of seventy two trials. Participants had been somewhere between seventeen as well as fifty years of age (median age twenty six) and were naive to the analysis emphasis of this particular experiment and just knew that the experiment's aim was comparing video conferencing methods.

Results

Thirty-five data sets from eighteen sessions had been analysed. As a result of a misunderstanding among experimenters, one participant was recruited two times. The other data set of that participant was thus dropped as well as isn't incorporated in the analysis.

Differences in social presence

There seemed to be a major primary outcome. Participants rated the social presence of condition vCVE ($M=5.4$, $SE=0.17$) drastically greater compared to social presence of condition sVC ($M=4.6$, $F(1,34)=17$, $SE=0.21$), $p <0.001$.

5. CELEBRITY QUOTES

This experiment focused on the effect of the amount of conveyance of a video CVE on the user experience as well as collaborative behaviour. The transportation property of a correspondence medium is actually driven by the extent to which the interface of its is actually created to psychologically transport the participants at their actual physical environment to a remote mediated context. The degree of

conveyance of a correspondence medium is as a result directly connected to the experience of presence at a remote room.

The experiment assessed preference, awareness, copresence, social presence, and physical presence. Additionally, it incorporated a series of questions evaluating the simplicity of use of the device which were informed by the usability problems that surfaced in the experiment Dogs & Owners.

Experiment task

A collaborative pair matching task was created for that experiment. 10 pictures of well known personalities in addition to 10 considerable quotes were provided to each team in every one of the 4 rounds. The task for the team at each round was finding as a lot of right celebrity-quote pairs as possible

Figure 1: An example set of quotes and photos. Participants had to collaborate to find matching pairs

DATA ANALYSIS

Social presence

There was a major primary outcome (F(3,48)=43, p <0.001 Social presence There was a considerable main effect (F(3,48)=43, p < 0.001) than sVC (M=4.4, SE=0.19), vCVE desk (M=4.3, SE=0.17), and vCVE im (M=4.4, SE=0.15).

Nevertheless, not one of the mediated circumstances showed important variations in pair wise comparisons. There's additionally a considerable interaction Medium Gender, F(3,48)=5.7, p=0.002, based on which social presence of a moderate decreased with the remoteness of its for female participants, while it enhanced for the male participants.

Physical presence

There was a major impact between the 2 vCVE interfaces, p=0.003, F(1,34)=10, based on which a greater sense of physical presence was perceived in the more immersive vCVE quality. There's additionally a considerable interaction Medium Gender, p=0.039, F(1,34)=4.6, based on which the expansion of physical presence of the more immersive vCVE quality was greater for male participants

Copresence, awareness, and ease of use

Awareness: a major primary outcome was discovered throughout the 4 different media, F(3,37)=69, p < 0.001. Post-hoc comparisons showed that awareness was considerably greater in FtF (M=6.5, SE=0.17, p < 0.001) than sVC (M=3.8, SE=0.23), vCVE desk (M=4.0, SE=0.21), and vCVE im (M=3.9, SE=0.21). Nevertheless, not one of the mediated circumstances showed important variations in pair wise comparisons.

There's additionally a considerable interaction Medium Gender, F (3,37)=3.0, p=0.045, based on which the feeling of awareness throughout cooperation reduced with the remoteness of an interface for female participants, while it increased somewhat for the male participants

Ease of use: a major primary outcome was discovered throughout the 4 different media, F(3,41)=22.7, p < 0.001. Post-hoc comparisons showed that the simplicity of use was considerably greater in FtF (M=6.2, SE=0.15, p < 0.001) than sVC (M=5.6, SE=0.17), vCVE desk (M=5.4, SE=0.17), and vCVE im (5.2, SE=0.2). Nevertheless, not one of the mediated circumstances showed important variations in pair wise comparisons.

6. COMPARISION BETWEEN ALL 3 EXPERIMENTS

Table below prospect lists the calculated overlaps for those scale combinations by experiment. Overlaps greater than 0.85 indicate correlating scales which might have calculated but the same underlying consequences. Very high overlaps involving measures for social presence, awareness, co-presence, and realism suggest that all of them explain associated facets of the feeling of being together in mediated interaction. In comparison, ease and confusion of use methods show lower overlaps with the social and awareness scales which implies they calculate a standalone dimension. Surprisingly, the preference scores appear to correlate much more with the social and awareness methods. Measures of physical presence showed only marginal overlap with social presence as well as awareness in experiment Celebrity Quotes which confirms the theoretical separation of physical and social presence. Discriminate validity, nonetheless, didn't hold for exactly the same ideas in experiment “Dreamhouse”.

Table 1: Discriminant Validity

Experiment	Scales	Overlap
Desert Survival Game	Social Presence – Realism	1.15
Dreamhouse	Social Presence – Physical Presence	1.38
Celebrity Quotes	Social Presence – Awareness	1.24
	Social Presence – Ease of Use	0.83
	Social Presence – Physical Presence	0.54
	Social Presence – Preference	0.82
	Awareness – Ease of Use	1.12
	Awareness – Physical Presence	0.06
	Awareness – Preference	0.81
	Ease of Use – Physical Presence	0.14
	Ease of Use – Preference	0.60
	Physical Presence – Preference	0.13

7. CONCLUSION

Sticking to the tradition of cross media studies, the quality of cooperation afforded by video CVEs was evaluated in a distant relative rather compared to complete manner, by exclusively contrasting elements of the users' experience as well as collaborative behaviour throughout several problems, which includes video CVEs, regular videoconferencing circumstances, as well as unmediated face-to-face base line controls. The results obtained had been capable to indicate detriments and advantages of video CVEs compared to regular video conferencing interfaces, as well as revealed possible problems as well as gaps compared to the face-to-face circumstance.

User experience dimensions incorporated social presence, physical presence, awareness, simplicity of use, and pleasure. The collaborative behavior was evaluated as well as compared using communication patterns, Linguistic characteristics, as well as view coordination procedures. Objective and subjective methods of the dimensions had been applied as well as used in 4 controlled user studies, investigating the effect of 2 pivotal screen qualities of video CVEs: spatiality, specifically the level of theirs of support for essential physical spatial properties; and transportation, specifically the amount to which they transport peoples' presence to a remote, synthetic space.

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