Togetherness through Virtual Worlds: How real can be that Presence?

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Abstract: Virtual worlds aim to give users a sense of being present in these environments by sharing that space and experiences with others. We analyse physical presence and togetherness for social interactions in virtual worlds, based on the users' report of two different platforms available on the internet and discuss how real this presence can be by adding new technologies to existing ones

Keywords: Presence, Togetherness, Virtual Environments, Virtual Worlds.

Resumo: Mundos virtuais visam dar aos usuários a sensação de estar presente nestes ambientes, compartilhando espaço e experiência com outras pessoas. Este trabalho analisa presença física e co-presença para interações sociais em mundos virtuais, baseado em depoimentos de usuários de duas plataformas diferentes disponíveis na internet e discute o quanto pode ser real esse senso de presença adicionando-se novas tecnologias às existentes.

Palavras-chave: Presença, Co-presença, Ambientes virtuais, Mundos Virtuais.

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1   Introduction

"I would be sorry to lose this part of my life. It has allowed me to meet people I'm sure I'd have never met. And I've learned so much from all of them" (a virtual worlds' user, about her experiences).

Virtual worlds have been designed to provide users with a mediated experience that seems natural, real and non-mediated, aiming to give them a sense of being present in that environments, sharing the same space and experiences with others. Among many applications of virtual worlds, one very important nowadays is the social and personal interactions to meet friends and family in distance.

The same way that telephone contact, e-mails and Fax are increasingly replacing physical mail for this kind of relations, these virtual worlds tend to be the best way for social communication in distance by making people feel closer than through a phone call or e-mails.

Generically, there are two groups of platforms available on the internet that are not limited to text chat, both aiming at this kind of social interactions, but using different technical approaches. They are: *Videochat* that uses webcam images as the way to represent people and *3D Virtual Worlds* where people have an avatar for their representation.

This ongoing research focuses on analysing presence and virtual togetherness - the sense of being with someone through virtual worlds - in social interactions, aiming to devise the best solution that improves these interactions.

As presence is a subjective experience [IJsselsteijn, de Ridder, Freeman & Avons, 2000], the effectiveness of the presence created by a virtual world can be partially measured by studying personal experience of users through these virtual worlds, as suggested by [Heeter, 1992].

The goal of our study is to know how people feel present in these available environments on the internet, how they feel the sense of togetherness and what makes them choose one or the other platform. In order to obtain that information, users of both platforms were asked to answer some questions referring to these subjects.

The idea of this questionnaire is to get real declarations of people, that already like the programs and want to be there, to use as a different insight to research, aiming to identify positive and negative aspects of the available technologies and visualize some improvements on it. This approach differs much from experiments made at a research laboratory, where people are aware of the experience. The answers obtained from this experiment are quite interesting and can conduce to important research.

Based on it, we will discuss the virtual togetherness for social interactions and how real this presence can be by adding new technologies to improve the existing ones.

2 Presence and Virtual Togetherness

Lombard and Ditton [1997] present six different conceptualizations of presence that incorporate some concepts found in the literature, and define formally Presence as the "perceptual illusion of non-mediation". They note:

> The term "perceptual" indicates that this phenomenon involves continuous (real time) responses of the human sensory, cognitive and affective processing systems to objects and entities in a person's environment. An "illusion of non-mediation" occurs when a person fails to perceive or acknowledge the existence of a medium in his/her communication environment and responds as he/she would if the medium were not there [Lombard and Ditton, 1997].

[IJsselsteijn, de Ridder, Freeman and Avons, 2000] stated that the Lombard and Ditton conceptualization can be grouped into two broad categories: physical and social presence. The first as the sense of being physically in a remote space and the second as the sense of being together with someone in a virtual space.

Durlach and Slater [1998] refer to the sense of being together with someone as the "virtual togetherness" or co-presence. They consider that two factors are really important to creating this virtual togetherness: presence in a common virtual environment and communication between them in this environment.

In our daily life, our process of communication includes natural facial expressions and body posture as form of expressing feelings, satisfaction, agreement or disagreement.

Including all this naturalness as part of communication in virtual worlds becomes a quite complex subject.

Nowadays, two different approaches for virtual environments are available on the internet to try to reproduce that communication's abilities between people and to give to users a sense of being present in these environments. One must choose between:

- the video stream captured from the users' webcams, or their still online pictures with their real voice by using a microphone, and text messages (Videochats);

- the 3D rendered avatar into a graphics virtual environment, expressing the intended users' actions by pre-recorded animations and text messages (3D virtual environments).

According to [IJsselsteijn, de Ridder, Freeman & Avons, 2000]: "videoconferencing or shared virtual environments are based on providing a mix of both the physical and social components, i. e., a sense of being there together".

Although both approaches demand high technology to provide the availability of all these resources and to support a big number of users connected, they are still to far from the ideal interaction, communication, presence and co-presence among remote people.

Because of this, the assessment to users' report about their experiences through these environments seems to be a good input to measure co-presence factors, and differs quite a lot from the situation when a user is submitted to an experiment inside a laboratory, or when he/she is asked to answer a post-test questionnaire. Besides that, presence is considered a subjective experience, what makes this information a relevant insight to new developments.

3 Our experiment

As part of the ongoing research, our experiment considered getting the information from programs' users a direct form of measuring subjective presence through virtual worlds.

The intention was to analyse to what extent people feel the physical and social presence, or virtual togetherness. We want to know how people feel present in these available environments on the internet, described in section 2, how they feel the sense of

togetherness and what makes them to choose one or the other platform. The users of both platforms were asked to answer some questions referring to those subjects when they were online, using the program normally.

Forty-eight users were interviewed, 24 in each platform, 50% males and 50% females, age range 24-46. About their time as programs' users: 3D virtual environments users range from months to 6 years and Videochat users are there for about 1,5 year in average. In order to be successful on interviewing, in both platforms, it was necessary to behave as a normal user, try to talk first and get some confidence from the person. The attempts of going directly on the subject behaving as an interviewer had failed.

3.1 The platforms used for the experiment

Two programs available on the internet were chosen to represent each category of virtual environments: *iSpQ VideoChat* [iSpQ Nanocom Corporation] for the videochat program and *ActiveWorlds* [ActiveWorlds.com Inc.] (AW) for the graphic 3D environment. Both are broad platforms that support many users, which we consider very representatives for the experiment.

The iSpQ videochat program allows to transmit an instant picture from a webcam with a text message included direct to a chosen user, as shown in Figure1; it is also possible to add to the same message, a message voice, through a microphone. Instead of simple messages, a person can connect to a videoconference, up to four users online. It is possible to reach people through a directory list of names and by reading their profiles. It supports a big number of users connected to the rooms.
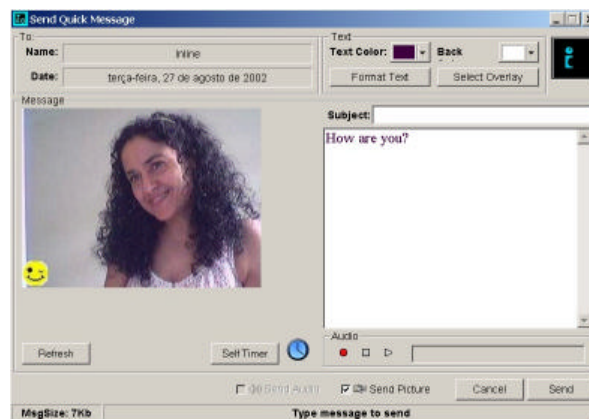

Figure 1 - iSpQ Videochat message layout

ActiveWorlds is a 3D virtual community that runs about 1150 different worlds. It supports many users connected at a time. Each user is represented by his/her avatar which has a big variety of appearance that users can choose one. The interaction is text-based and the chat voice is restricted to some areas. Figure 2 shows an AW screen with some avatars.

Figure 2 - Avatars talking in ActiveWordls

People can build their houses on some specific areas, play 3D games, take part on collective games like bingo and make kind of social activities. People reach others by just meeting on the streets and start talking. They can express some gestures by using some pre-recorded animations.

3.2   Users feedback

The first surprising fact we could realize is that most users from one platform don't know or don't use the other platform. Although the users of both programs constitute apparently two different groups, they have many points in common. In reality, they are there for the same reasons: meeting new people, friends, or family and sharing experiences.

It is important to remark that users on videochat hardly accept to talk when we were not using a webcam, they really want to see who is at the other side. They want to see the other people the way they are, no dummies (as they would refer to the avatar) and like people to see them as real as possible; so, for these users the camera is fundamental. The avatars' users like the anonymity allowed by that representation, although they declared that after creating some relation of confidence and friendship they like to swap pictures of themselves and want really to know the real appearance of each other.

In first contact, Videochat users are more defensive, since they are showing their faces to someone they don't know who he/she is, and maybe as consequence of this fact people try to be more polite giving the connotation of a real meeting. In opposition to that, people using an avatar showed to be a little less defensive in first contact, but also less polite sometimes, when they want to end the conversation and just disappear in front of you without even say "bye". Not using a webcam is seen as a kind of protection.

About physical presence:

Surprisingly, the answers related to physical presence, the sense of being physically in that space, showed that trusting the other chatfriend increases this sense of presence. This reaction was the same in both platforms.

> "...when you feel trust, the distance becomes smaller, and it feels a bit like you are talking with someone who is in the kitchen..." (a videochat user, about physical presence).

By the other hand, some people mentioned that the fact they can't sense objects as they are really in the same room is a weak point for the physical presence.

The videochat users were asked to compare how they feel the physical presence when they are just exchanging still pictures' messages and when they are connected on videoconference. All of them told that this presence increases by seeing someone's gestures, appearance and facial expressions in movement; certainly it seems like another experience, they told. These answers agreed with what Detenber and al.[Detenber, Simons and Bennett Jr, 1998] obtained in their experiment about the "Effects of Picture Motion on Emotional Responses".

For the AW users, the fact that they can walk around the world, build houses and gardening give them a good feeling of physical presence and creation. "Some people that have non creative jobs in real life can be as creative as their imaginations will take them in AW", told an AW user.

About togethern ess:

People in AW told they can keep their avatars distant from a person that they feel distant in feelings. They can feel like sharing the same views and that their minds can work closer

when they grow close friendship. All of this always depends on the person with whom they are talking. The feeling of closeness varies.

> "...there have been times when I've lost sight of the fact that there were great distances between me and the person I feel close to..." (an AW user, about togetherness).

People on videochat expressed the same impressions of AW users and told that the situation can be intimate sometimes for example when they share their feelings and they can see the happiness or sadness on one's face.

The group of people that confirmed some high level of presence and togetherness (about 92% of interviewed people) affirmed that they really like many people they just met virtually and they can say they trust them. People that declared they don't feel togetherness at any level, neither a good feeling of presence, affirmed that they don't let themselves to get involved in their minds. They keep them pretty mentally separated from the program. They believe the person behind the avatar or the webcam can be different in real life, so no trust. They represent 8% of interviewed people and are all males.

But all people agreed in telling that togetherness is not possible while they cannot smell, hear or feel/touch the person.

About touch:

Everybody, in both platforms, mentioned that they really miss the real physical touch and for sure they would accept a device that could provide it.

About voice:

100% of users, in both programs, confirmed that they would like to talk naturally in real voice. To hear someone's voice makes it real closer.

About immersion:

> "I feel totally immersed with you right now because you're a fellow human, because we're touching on interpersonal relationships and because I think this interview means something to you" (an AW user, after about one hour talking).

Many users, about 83%, declared to attain a high level of mental immersion in these programs and that their experiences in these environments have a strong relation with their real life. An AW user told: "I laugh, sometimes cry, get angry. I also tend to have some expectation of how that person will react towards me". "I dislike the term *real life* because my life is real and I'm sure yours is too and being separated by a computer doesn't diminish this".

Users related causes that break their "immersion" in these environments. In general, they are: disturbance in the real world, i. e., in the room where they are; a computer that doesn't work; a slower connection certainly breaks the experience; concentration becomes difficult when the pauses become too long; when he/she engages an argument with someone else in the virtual environment and when there is lag in responses. Some videochat users, when in videoconference, said the fact that the voice doesn't follow the mouth simultaneously breaks the involvement; this delay shows the distance and makes it very obvious.

About new features in programs:

Users of both programs mentioned features that they really think would improve their experiences in virtual worlds. Although we know that some of them are already being developed, we will just transcript them:

- a quicker connection;
- the picture to be larger and clearer;
- live video images of the both persons, together;
- better microphones and direct chat voice in all platforms. 100% of people told they like to hear the real voice of the other person. For them, real voice improves realism;
- the possibility to talk with each other without having to press a button all the time;
- the avatars could be smoother jointed and the animations smoother; avatars could sit down and stand up without having to press buttons; having an avatar more closely resembling the real person;
- graphics help to set a mood, so it is important better quality on it;
- touch. It would be nice when someone would touch the screen and could feel the other part;

- taste and smell. An apparatus which gives through the smell of someone, because the smell has a very strong connection to the memory;

- sharing the same things possible with a kind of box where things can be digitally transported...maybe a connector for handles as used in the virtual reality technology;

- maybe the possibility to travel through the net to the other side to meet the person you are chatting with.

4   How real can be that Presence?

By analysing the report above, based on users' experiences, we will discuss some relevant problems existing in nowadays virtual worlds platforms available on the internet.

The videochat platform has the big problem of video and audio streams not synchronized. The delay to transfer images and video are relevant. The quality of images and audio are not so good as well. 3D graphics environment still have some limitations about avatars, natural interaction, rendering speed, virtual camera control, etc.

Videochat doesn't provide a social interaction of people by doing social activities others than chatting. By the opposite, the 3D graphics environment has the big advantage of allowing social activities as games, walking around, virtual shopping, building houses, etc. but doesn't allow people to see the other chatfriend when they like that.

One important discussion is about these two questions: be seen or not be seen? added to the social activities. These aspects seemed to be what makes people decide to use videochat or 3D graphics platform.

The videochat users defend the webcam use and want improvements on images and video, and more interactivity between people. The avatars' users defend their anonymity until they get to know each other well. From there, they want to share pictures; so, in that case a camera would be acceptable. The wish of having an avatar similar to their images, showing emotions and natural movements are a trial of reproducing their real personality and appearance to the other part.   Looking at these aspects, many questions can be done related to the technologies that would be added to those platforms in order to improve togetherness and physical presence.

What would be then the best form for these contacts? Adding new media to videochat to provide new interactions, like touch, smell and live voice? Taking the videochat features to into the 3D virtual worlds? Avatars that reproduce faithfully the real look of a person, and express feelings and gestures from people, while the users are being sensored in real time, similar to the virtual reality approach? An avatar interacting directly with other avatar and experiencing touch, smell, etc?

Maybe the merging of both technologies would be a great solution. An avatar reproducing on his/her face the real time webcam image from the user could solve the lack of facial expressions and emotions in the graphics virtual environments available, as it has being developed at The Blue-C Project [Staadt, Naf, Lamboray and Wurmlin, 2001]. Users of videochat platforms could have more interaction with the other part through their avatars, and still keep the vision of their real faces, what is really important to them and really improves proximity. As all users agreed, touch could be a great form of increasing togetherness, as also stated [Ho, Basdogan, Slater, Durlach and Srinivasan, 1998] in their study about haptic communication.

Biocca [1997] discusses about the possibility of developing a medium that allows greater access to the intelligence, intentions and sensory impressions of another person, what he called *Hyperpresence*. It is not simple to imagine how a medium can provide more proximity then a face-to-face communication.

> "The body is the medium for this transfer. Communication codes such as spoken language and non-verbal codes such as facial expression, posture, touch, and motion are used. But, for example, inner states might be communicated more vividly through the use of sensors that can amplify subtle physiological or non-verbal cues. These can augment the intentional and unintentional cues used in interpersonal communication to assess the emotional states and intentions of others" [Biocca, 1997].

5   Conclusions

Virtual worlds play a very important role in social interactions nowadays. People use these environments as a resource to meet friends and family at remote locations, in order to shorten physical distance.

This ongoing research focuses on analysing presence and virtual togetherness, aiming to devise the best solution that improves these social interactions.

Until now there is not a generally accepted theory of presence, since the scientific research into this subject is considered to be in its initial stage.

The present work analysed the sense of physical presence and togetherness experienced by users of two different platforms available on the internet: iSpQ Videochat and ActiveWorlds, by interviewing them about these subjects. The answers obtained from users are quite interesting. They have corresponded to our expectations. In addition to that, we also obtained fantastic declarations.

Based on the users' report, we can conclude that both platforms don't correspond entirely to the users expectation, so they need improvements. We discussed some relevant problems existing in nowadays virtual worlds platforms. Furthermore, questions were placed related to new technologies that would be added, maybe by merging the both platforms, to improve togetherness and physical presence in virtual worlds.

Although this ongoing research is focusing on social interactions, the results can be used for many applications such as Learning in Distance Education, Training, Simulation, Treatment of Phobias, Interactive TV, Entertainment and others.

> "Behind the virtuality there are real people, so reality! The virtuality is just the way to beat physical distance" (a videochat user).

Acknowledgements

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