

Towards a cultural approach to presence

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Summary

In our everyday life, the possibility of enjoying an experience is strongly related to the possibility of defining a context. This issue is well known by the visitors of theme parks: aspects of immersive interfaces, including displays, graphics and control device quality are as important to the users as the “physics fidelity” (e.g. motion) of the rides, their background stories and goals. In general, to be “present” in the context offered by a symbolic system, the user has to be aware of its meaning. Following this approach, we propose a new definition of presence that (a) recognizes the mediated character of every possible experience of presence; (b) always conceives experience as immersed in a social context; (c) stresses the component of ambiguity inherent in everyday situations; (d) highlights the function of explanation which culture (artifacts and principles) plays.

1. What is a “realistic” experience?

For researchers working on Virtual Environments (VE) or Teleoperation Systems (TS) a clear definition of *presence* and *telepresence* may be useful to orient their work. Most researchers in these fields share the current meaning assigned to these concepts, which are defined by Schloerb (1995) as follows: *physical presence* designates “...the existence of an object in some particular region of space and time. For example, this text (in some form) is physically present in front of you now” (p. 68). According to Schloerb, physical presence supports *subjective presence*, consisting of the perception of being located in the same physical space in which a certain event occurs, a certain process takes place, or a certain person stands [1].

Following this approach, the key difference between presence and telepresence is that the former is a “natural” fact, whereas the latter is a fact produced by technology, an artifact. This difference also

occurs in the definition of Slater & Wilbur [2], according to whom presence “...is both a subjective and objective description of a person’s state with respect to an environment” (p. 606). Particularly, *objective description* is defined as “...an observable behavioral phenomenon, the extent to which individuals behave in a VE similar to the way they would behave in analogous circumstances in everyday reality” (p. 606).

Even if these definitions seem very intuitive to us, their effects aren’t. In fact, this position has an important implication for the design of a VE [3]: the adequacy of a telepresence system depends on the faithfulness with which it succeeds in recreating conditions which allow us to perceive ourselves, or other people or objects, as physically present in a “real” environment.

Most of the work in this area tries to improve presence of a VE by providing to the user a more “realistic” experience, such as adding physical qualities to virtual objects. For instance, Hoffman et al. [4]. published in the “Virtual Reality” journal the results of two experiments in which they tried to verify if adding olfactory cues and tactile feedback to a VE may improve its sense of presence. But is it really so important this focus on the physical characteristics of a VE?

2. The role of context

In our everyday life, the possibility of enjoying an experience is strongly related to the possibility of defining a context. This issue is well known by the visitors of theme parks: aspects of immersive interfaces, including displays, graphics and control device quality are as important to the users as the “physics fidelity” (e.g. motion) of the rides, their background stories and goals. In general, *to be “present” in the context offered by a symbolic system, the user has to be aware of its meaning.*

As suggested in the paper published in the “Virtual Reality” journal just after the one of Hoffman et al., more than the richness of available images, the sensation of presence depends on the level of interaction/interactivity which actors have in both “real” and simulated environments [4]. According to the two authors a VE, particularly when it is used for real world applications, is effective when “the user is able to navigate, select, pick, move and manipulate object much more naturally (pp.235). In this sense, emphasis shifts from quality of image to freedom of movement, from the graphic perfection of the system to the actions of actors in the environment: “Experience of space will depend more on the mode of locomotion than on the visual and acoustic images. The reality of a surface will be in its implications for action (e.g., does it impede locomotion) rather than in its appearance (e.g., does it look like a wall). In this approach, the reality of experience is defined relative to functionality, rather than to appearances” [5].

The roots of this position are in Heidegger’s philosophy and in the theory of perception of J. Gibson [6]. According to these authors, the environment does not provide undifferentiated information,

ready-made objects equal for everyone. It offers different opportunities according to the actors and their needs. *Affordances* are not “things which are outside” simply waiting for someone to come and take a photograph of them. They are resources, which are only revealed to those who seek them. What has all this to do with presence, telepresence and virtual environments? Zahoric & Jenison [7]. explain it clearly: “*presence is tantamount to successfully supported action in the environment*” (italics in the original).

3. A cultural concept of presence

These considerations suggested us to propose a *cultural* concept of presence as a social construction [8]. Lying at the base of this view are two elements which promise an elevated sense of presence: a *cultural framework* and the possibility of *negotiation*, both of actions and of their meaning [9]. Tracing a surprising parallel between the task of VR designers and that of phone sex workers - two figures who have the task of making the human body visible by means of extremely narrow channels of communication and who succeed in their task to the extent in which they use powerful, shared, cultural codes - Stone [10] describes the context, as composed mainly of symbolic references which allow actors to orient and coordinate themselves. Within this view, experiencing presence and telepresence does not depend so much on the faithfulness of the reproduction of ‘physical’ aspects of ‘external reality’ as on the capacity of simulation to produce a context in which social actors may communicate and cooperate [8-11].

Following this approach, we can propose a new definition of presence that (a) recognizes the mediated character of every possible experience of presence; (b) always conceives experience as immersed in a social context; (c) stresses the component of ambiguity inherent in everyday situations; (d) highlights the function of explanation which culture (artifacts and principles) plays. Breaking down this idea into formulas, we may say that [8].

- presence is always mediated by both physical and conceptual tools which belong to a given culture: “physical” presence in an environment is no more “real” or more true than telepresence or immersion in a simulated virtual environment;
- the criterion of the validity of presence does not consist of simply reproducing the conditions of physical presence but in constructing environments in which actors may function in an ecologically valid way: we accept the emphasis of ecological approach on the primacy of action on mere perception;
- action is not undertaken by isolated individuals but by members of a community who face ambiguous situations in a relatively coordinated way: to be able to speak of an actor’s presence in a given situation, his freedom of movement must be guaranteed, both in the

physical environment (locomotion) and in the social environment, composed of other actors involved in the same situation, in whatever way and for whatever reason.

The main consequence of this approach for the design and the development of VR systems is that the users' presence in an environment exists if and only if they can use the VR to interact. To allow interaction in a given situation, the user's freedom must be guaranteed, both in the physical and in the social environment. In fact, more than on the richness of available images the sensation of presence depends on the level of interaction/interactivity, which actors have in both "real" and simulated environments. In this sense, emphasis shifts from quality of image to freedom of movement, from the graphic perfection of the system to the actions of actors in the environment.

References

- [1] Schloerb, D.W. 1995 A quantitative measure of telepresence. *Presence, Teleoperators, and Virtual Environments*, 4, 64-80.
- [2] Slater, M. & Wilbur, S. 1997 A Framework for immersive virtual environments (FIVE): speculations on the role of presence in virtual environments. *Presence, Teleoperators, and Virtual Environments*, 6, 603-616.
- [3] Riva, G. & Mantovani, G. 1999 The ergonomics of virtual reality: human factors in developing clinical-oriented virtual environments. In J.D. Westwood, H.H. Hoffman, R.A. Robb e D. Stredney (a cura di) *Medicine meets virtual reality: The convergence of physical & informational technologies* (pp. 278-284). Amsterdam: IOS Press.
- [4] Hoffman, H. G., Hollander, A., Schroder, K., Rousseau, S., & Furness III, T. (1998). Physically touching and tasting virtual objects enhances the realism of virtual experiences. *Virtual Reality*, 3(4), 226-234.
- [5] Sastry, L, & Boyd, D.R.S. 1998 Virtual environments for engineering applications. *Virtual Reality*, 3 (4), 235-244.
- [6] Flach, J.M. & Holden, J.G. 1998 The reality of experience. *Presence, Teleoperators, and Virtual Environments*, 7 (1), 90-95.
- [7] Zahoric, P., Jenison, R.L. 1998 Presence as Being in the World. *Presence, Teleoperators, and Virtual Environments*, 6, 603-616 7(1), 1998, 78-89.
- [8] Mantovani, G. & Riva, G. 1999 "Real" presence: How different ontologies generate different criteria for presence, telepresence, and virtual presence. *Presence, Teleoperators, and Virtual Environments*, 8 (5), 538-548.

- [9] Cole, M. 1996 *Cultural psychology: A once and future discipline*. Cambridge, MA: Harvard University Press.
- [10] Stone, A. R. (1996). *The war of desire and technology at the close of the Mechanical Age*. Cambridge, MA: MIT Press.
- [11] Mantovani, G. & Riva, G. (2001) Building a Bridge between Different Scientific Communities: On Sheridan's Eclectic Ontology of Presence. *Presence, Teleoperators and Virtual Environments*. 10 (5), 537-543.