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# Toward a Taxonomy of Copresence

## Abstract

This paper contributes to the presence literature by explicating the meanings and subtypes of copresence. *Copresence* is defined here as consisting of two dimensions: copresence as mode of being with others, and copresence as sense of being with others. Mode of copresence refers to the physical conditions that structure human interaction. Six such conditions are delineated. Sense of copresence, on the other hand, refers to the subjective experience of being with others that an individual acquires in interaction. The main argument of this paper is that mode of copresence affects sense of copresence, and knowledge of how the former affects the latter will benefit copresence design.

## 1    Introduction

"Copresence" is a sociological concept that describes the conditions in which human individuals interact with one another face to face from body to body (Mead, 1934; Cooley, 1956; Goffman, 1963). This concept has recently been appearing in the presence literature with increasing frequency, signaling the rise of a growing interest among presence researchers in extending presence technology to the realm of human interaction. However, like the concept of presence at its nascent stage, the meaning of copresence in the context of mediated human communication is yet to be fully explicated.

In the existing presence literature, copresence is primarily used to refer to either the sense of being together with other people in a remote physical environment (Muhlbach & Prussog, 1995; Slater, Sadagic, & Schroeder, 2000), or the sense of being together with other people in a technology-generated environment (Durlach & Slater, 2000; Schroeder, 2002; Slater et al., 2000). This use of copresence is therefore parallel to the established usage of presence that refers to either telepresence (the sense of being present in a remote physical environment) (Held & Durlach, 1992; Minsky, 1980) or virtual presence (the sense of being present in a simulated virtual environment) (Sheridan, 1992; Steuer, 1992). The difference between these two concepts is that whereas presence primarily deals with human-object relations, copresence pertains only to human-human relations. Distinguishing humans from nonhuman objects and treating people as a separate category for study are the main contributions of the introduction of the copresence concept to presence research.

Copresence has also been called *social presence* (Biocca & Harms, 2002; Rice, 1992; Short, Williams, & Christie, 1976), which refers to the sense of being together with others in a mediated—either remote or virtual—environment. However, copresence as subjective experiences of being with others is

different from the sociological concept of copresence, which mainly refers to the physical modes of being together with others. This sociological notion of copresence when applied to presence research also includes the technological conditions that mediate human communications (Altheide, 1995; Thomson, 1995). The purpose of this paper is to propose a way of reconciling these two different notions of copresence that may lead to confusion if not clarified. Rather than choosing one in favor of the other, I see these two concepts as complementary. More specifically, I regard human copresence as consisting of both the physical conditions in which human individuals interact and the perceptions and feelings they have of one another. Whereas the physical conditions constitute the mode of copresence, perceptions and feelings constitute the sense of copresence. A central argument to be advanced in this paper is that sense of copresence is influenced by a number of factors, and one of these factors is mode of copresence. As such, knowledge of how the mode of copresence affects the sense of copresence will be particularly useful for copresence design.

This paper is divided into two parts. The first part offers a typology that delineates six modes of copresence, along with a description of several interface parameters that structure the ways in which individual interactants come into contact with one another. The second part examines issues related to sense of copresence and their implications for copresence design and measurement.

## 2 Copresence as Mode of Being with Others

### 2.1 A Typology of Copresence

Copresence as mode of being with others is a form of human colocation in which individuals become "accessible, available, and subject to one another" (Goffman, 1963, p. 22). More specifically, it is a set of spatiotemporal conditions in which instant two-way human interactions can take place. *Instant* human interaction refers to real-time or near real-time human communication, which excludes diachronic exchanges like postal correspondence, and *two-way* human interaction refers to reciprocal or feedback-based human communication, which does not include unidirectional "parasocial" behaviors (Horton & Wohl, 1979), such as watching TV or listening to the radio. Copresence in this sense is thus a form of human colocation in space-time that allows for instantaneous and reciprocal human contact.

Different forms of copresence can be delineated based on two major characteristics of colocation: physical distance between the interacting individuals and whether the individuals are bodily present at the site of colocation. To construct a typology using these two criteria, let us examine a simple situation of interaction that involves only two individuals. The distance between the individuals can be dichotomized into "proximal" and "remote." *Proximal distance* is an area within range of the naked or normal sense perceptions of both individuals, and *remote distance* is an area outside the range of the individuals' naked sense perceptions but within reach of the extended sense perceptions of the individuals. Perceptual extension refers to the extension of normal human sense perceptions through electronic mediation, such as via telephone, cell phone, email, or online chat, which allows human individuals to be "copresent everywhere at once" (McLuhan, 1964). Because proximal distance is commonly referred to as *physical proximity,* remote distance thus defined can be called *electronic proximity* (Dertouzos, 1998).

Depending on whether the individuals are bodily present at the site of colocation, three presence conditions can be identified: both individuals are corporeally present at the site; one individual is corporeally present at the site but the other individual is only virtually present at the site through an interactive representational device; and both individuals are virtually present at the site, with each being represented by an interactive device. Interactive representational devices are automated or robotic entities, in either physical (steel, plastic, and rubber) or digital (software agents) form, that are capable of communicating with other people on behalf of the individuals who are themselves not corporeally present at the site.

Cross-classification of the two types of proximity (physical proximity and electronic proximity) with the

**Table 1.** *A Taxonomy of Copresence*

| Corporeal | Distance Between Two Sides | |
| Presence on | Physical Proximity | Electronic Proximity |
| --- | --- | --- |
| Both sides | Corporeal copresence | Corporeal telecopresence |
| One side | Virtual copresence | Virtual telecopresence |
| Neither sides | Hypervirtual copresence | Hypervirtual telecopresence |

three types of presence conditions (corporeal presence on both sides, on one side, and on neither side) yields a two-by-three taxonomy that consists of six modes of human copresence, which are displayed in Table 1.

**2.1.1 Corporeal Copresence.** Corporeal copresence is a form of human colocation in which both individuals are present in person at their sites as well as in each other's physical proximity. The colocation is such that the individuals are within range of each other's naked sense perceptions, and they are able to reach each other simultaneously through unmediated sensory channels. Under the "full conditions of copresence," according to Goffman (1963), "persons must sense that they are close enough to be perceived in whatever they are doing, including their experiencing of others, and close enough to be perceived in this sensing of being perceived" (p. 17).

Corporeal copresence is the most primitive mode of human togetherness. To interact with someone in corporeal copresence is to interact with that person face to face from body to body. Besides verbal exchanges, corporeally copresent individuals also communicate with each other with nonverbal behaviors, such as facial expressions, gestures, postures, and the arrangement of the immediate physical settings in which their bodies are situated. Examples of corporeal copresence include "those festal evenings around the camp-fire which many of us can recall, with individual and group songs, chants, 'stunts' and the like" (Cooley, 1956, p. 109).

**2.1.2 Corporeal Telecopresence.** Corporeal telecopresence is a form of human colocation in which

both individuals are present in person at their local sites, but they are located in each other's electronic proximity rather than physical proximity. Although positioned outside the range of each other's naked sense perceptions, the individuals are within immediate reach of each other through an electronic communications network. By electronically extending their senses over the Internet, for example, physically separated individuals, who may be half a world apart, can stay in instant contact with each other.

Telecopresence needs to be distinguished from unidirectional remote presence, which allows for only a one-way flow of information. In watching a live coverage of a football game on television, for example, TV viewers are remotely present at the football stadium, but people at the football stadium are not remotely present at the place where the TV viewers are. As a result, only the TV viewers can see the stadium people; the stadium people cannot see the TV viewers. By the same token, listening to the radio is also a form of unidirectional remote presence. However, when individuals in separate locations have the capacity to receive live sensory inputs from each other, unidirectional remote presence turns into telecopresence (Zhao, 2001).

To interact with someone in corporeal telecopresence is to interact with that person "face to device," that is, person to person via a communications network plus an interface device. The person on one side of the communication line uses an electronic device, such as a networked desktop computer, to get in touch with the person on the other side of the line, who is also equipped with a network device, such as a wireless handheld. Through such electronic mediation, remote people are

brought into instant contact with each other. Examples of human contact under conditions of corporeal telecopresence include talking to a friend over the phone, chatting with someone through instant messaging, and holding a videoconference via satellite.

**2.1.3 Virtual Copresence.** Virtual copresence is a form of human colocation in which both individuals are in each other's physical proximity, but one is present in person at the site and the other is present through a physical representation. Located within range of the naked sense perceptions of its human counterpart, the physical representational device interacts with the copresent individual "face to face" from "body to body."

Interactive physical representations of human individuals are also called social robots, which can be divided into instrumental and communicative subtypes. Instrumental social robots simulate the causative aspect of human interaction and are primarily used to relieve individuals from the tedium of repetitive transactions involving other people. Bank ATMs, for example, serve human customers round the clock in place of bank tellers, cashiers, and other human assistants.

Communicative social robots, on the other hand, simulate the emotive aspect of human interaction and are used to substitute for people in their intimate contact with other human individuals. "Relational artifacts" (Turkle & Salamensky, 2001), such as Furby (an interactive plush toy) and Aibo (a robotic dog), are designed to trigger human emotions with facial expressions, gaze direction, and voice. And embodied robots like Kismet (Thomson, 2001) may one day leave the laboratory to take the place of social workers in providing care and companionship to socially isolated individuals.

Both instrumental and communicative social robots differ from what has come to be known as "industrial robots" (Frude, 1984). Industrial robots are automated machines that replace humans in interacting with nonhumans. For example, in place of a human worker, a robotic arm performs hazardous tasks inside a nuclear reactor. Social robots, on the other hand, are entities made to replace humans in interacting with humans. For example, in place of a bank teller, an ATM conducts business transactions with human customers. Whereas

instrumental social robots are mostly automated machines that perform repetitive tasks according to preprogrammed instructions, ideal communicative social robots are trainable objects equipped with a learning capability that enables them to adapt to changing social environments (Alpert, 2001).

**2.1.4 Virtual Telecopresence.** Virtual telecopresence is a form of human colocation in which both individuals are in each other's electronic proximity, but one is present in person at the site and the other is present through a digital representation. Digital representational devices are interactive computer programs (software agents) that run on either local or remote computers.

Like physical social robots, interactive computer programs, or *social bots,* can be grouped into two categories: instrumental and communicative. Instrumental social bots, commonly used in automated response services, handle routine human inquiries on behalf of human operators. Examples include MapQuest on the World Wide Web, which gives driving directions upon request, and Googly, an online automated buddy that answers human queries in natural human language (Liebeskind, 2001). Communicative social bots, typically for personal recreation, interact with real people on an emotional level. Examples include interactive computer programs, such as ELIZA, with which people converse for fun (Weizenbaum, 1966), and digital human characters like those simulated by Princess Maker that people adopt (Coleman, 1996).

Social bots differ from other types of computer programs in that they are specifically designed to communicate with humans in place of humans. In the case of instrumental social bots, computer programs replace direct human assistance with automated response systems that make information sharing more efficient. And, in the case of communicative social bots, computer programs mimic human interaction in providing people with entertainment, interpersonal training, or psychological comfort.

To interact with others in virtual telecopresence is therefore to interact with interactive computer programs that simulate human responses. When such a program

runs on a local computer that is not networked, "tele-copresence" becomes an analogy rather than an accurate description, for a user can interact with the program without the mediation of a communications network. In the foreseeable future, however, remote computing may become the norm, as more programs will be installed on centralized servers to be accessed by distant human users over the Internet.

**2.1.5 Hypervirtual Copresence.** Hypervirtual copresence is a form of human colocation in which individuals on both sides are virtually present at the site through physical representations that are positioned in each other's physical proximity. Serving as the surrogates for humans, robotic devices interact with each other in close range on behalf of the individuals they represent. Unlike industrial machines, these robotic devices are specially designed to engage in social interactions that are human in nature. In some instances, these interactions are performed mainly to entertain humans, such as robotic football games (RoboCup, 2002); in other instances, they are performed as part of a real social event that can have serious consequences, (imagine a circumstance in which robotic warriors are deployed in battlefields to fight wars with and for humans).

**2.1.6 Hypervirtual Telecopresence.** Hypervirtual telecopresence is a form of human colocation in which individuals on both sides are virtually present at the site through digital representations that are located in each other's electronic proximity. These digital robots or software bots interact with each other in cyberspace on behalf of the individuals they represent. An example of hypervirtual telecopresence is the roaming of intelligent Web agents over the Internet collaborating with each other to accomplish designated tasks for human users (Jesdanun, 2001). These software agents represent human agents, and the interactions among them are thus human interactions in nature.

In addition to these six basic modes, there are hybrid or mixed modes of human copresence. For example, the combination of corporeal telecopresence and virtual telecopresence constitutes what has come to be known as a "synthetic environment," in which human individu-als interact with each other remotely in real time via avatars that operate in virtual settings (Durlach & Slater, 2000; Riva & Davide, 2002).

## 2.2 Interface Parameters

Modes of copresence are types of human colocation in which human interaction takes place. Within each type of colocation, however, there can be different interface arrangements that allow copresent individuals to interact with each other in many different ways. Interfaces of communication, therefore, determine the specific ways in which colocated individuals come into contact with each other. Embodiment, immediacy, scale, and mobility are important interface parameters that deserve special attention.

**2.2.1 Embodiment.** Embodiment refers to the involvement of human bodies in the process of communication. A continuum can be constructed ranging from total body to fully disembodied communications. "Total body communication" (Poyatos, 1975) involves both verbal and nonverbal human behaviors, with the latter including a rich array of "body idioms" (Goffman, 1963) such as facial expressions, gestures, and postures. This type of fully embodied communication requires a face-to-face interface that engages all human sensory channels. The least embodied interface is plain text messaging, which does not reveal any corporeal characteristics of the copresent individuals.

As physical distance between the communicating individuals increases, the number of sensory channels involved in the communication decreases, starting with the loss of the channels of taste, smell, and touch, and followed by hearing and vision. Such perceptual losses, however, can be partially restored through sensory extensions via electronic mediation. A multimedia interface such as the videophone allows distant individuals to see and hear each other in real time, and a tele-embodied proxy, such as a personal roving presence (ProP) device, can interact with people "face to face" under the direction of a remote user (Paulos & Canny, 2001). Efforts are also being made to restore olfactory and

other perceptual channels in remote communication (Davide, Holmberg, & Lundstrom, 2001).

Perceptual losses due to physical distance can also be remedied through computer simulation that generates digitally embodied human characters (avatars). These simulated corporeal characteristics may or may not resemble the true characteristics of the telecopresent individuals, but they add sensory cues to an otherwise disembodied process. Graphical images, synthetic sounds, electrocutaneous displays, and other tele-immersive techniques can be used to create a virtual environment that mimics a real physical setting for telecopresent interaction (Lanier, 2001).

### 2.2.2 Immediacy.

*Immediacy* refers to the speed at which messages travel back and forth between copresent individuals. An interface for synchronous communication, such as the phone-to-phone contact, enables copresent individuals to reach each other instantaneously. Depending on the bandwidth of the given medium, telecopresent data transmission has varied time lags. The immediacy of communication also can be deliberately regulated through an interface design, which permits real-time or near real-time interaction in the case of instant messaging and conference calls, but imposes an asynchronous structure in the case of email, listservs, and bulletin boards.

### 2.2.3 Scale.

*Scale* refers to the number of people enabled by a given interface to interact with one another. The face-to-face interface in corporeal copresence allows only a small number of people to communicate with one another. In telecopresence, the "scale of community" varies tremendously depending on the types of interface used in the communication: telephones are typically used for two-person conversations, email supports one-to-one dialogs as well as one-to-many broadcasting, and electronic bulletin boards open the floor to virtually any number of people who want to participate in the discussion (Feder, 2001).

### 2.2.4 Mobility.

*Mobility* refers to the capacity of copresent individuals to carry on interactions while in locomotion. The face-to-face interface in corporeal co-

presence supports a limited amount of mobility, provided that all the participants physically move along in sync with one another. Telecopresence has three basic types of mobility conditions: stationary, portable, and wearable. The stationary condition, such as communicating through desktop computers in fixed locations, essentially permits no mobility. The portable condition, such as communicating through laptop computers, allows individuals to temporarily suspend their communicating while on the move and to resume it when they are stationary. Portable devices can also be used to allow communication in transit when users are on planes, trains, and the like. The wearable condition, such as communicating through mobile phones, monocular head-mounted displays, and other body-worn networked devices, enables distant individuals to continue interacting with one another while some, or even all, of them are simultaneously moving around. The widened use of wearable communication devices in the general population will eventually make telecopresence a truly ubiquitous phenomenon.

Different combinations of interface parameters within different forms of colocation give rise to different modalities of interaction, which in turn affect the interactants' sense of being with others in a given copresence situation.

## 3    Copresence as Sense of Being with Others

### 3.1 Sense of Copresence

Sense of copresence or "social presence" refers to an individual's subjective experience of being together with others under a copresence condition. As such, sense of copresence is different from mode of copresence: whereas mode of copresence refers to an individual's actual spatiotemporal colocation with other people, sense of copresence involves an individual's perceptions and feelings of being with others (Zhao, 2002).

An individual's sense of being with others is basically a psychological phenomenon, which may or may not correspond to the actual state of copresence. An individual, for example, can be made to feel that he or she is

interacting with another human being, even though the individual is in fact completely alone. The technologies of creating an "illusion of being with others" have been utilized not only for recreation, but also for education, social skills training, eldercare, and therapeutic treatment of mental illnesses like autism and social phobia (Pertaub, Slater, & Barker, 2001). A main task of copresence research is to understand the etiology and formation of sense of copresence and to find out how a sense of being with others can be affected or created technologically through copresence design.

Undoubtedly, an individual's perceptions and feelings of being with others are shaped by a set of complex factors that are both internal and external to the individual. For example, psychological states, such as mood, alertness, and prior experiences, will affect an individual's sense of copresence, and environmental factors, such as temperature, light, sound and smell, may also influence an individual's sense of being with others. Among all the relevant factors, the one that particularly interests presence researchers is mode of copresence, namely, the physical and technological conditions that structure the ways in which an individual comes into contact with others.

According to the different combinations of the characteristics of proximity and corporeality of presence, six modes of copresence have been delineated. Of those six modes, hypervirtual copresence and hypervirtual telecopresence do not have an immediate bearing on the study of sense of copresence, for in both instances human individuals are not directly engaged in the interactive processes. The remaining four modes of copresence, however, bring about three types of human interaction that significantly affect an individual's sense of copresence: face-to-face interaction in corporeal copresence, computer-mediated communication in corporeal telecopresence, and human-computer interaction in virtual copresence or virtual telecopresence.

Face-to-face interaction in corporeal copresence tends to generate the most vivid sense of copresence (Cooley, 1956; Goffman, 1963). One's perceptions and feelings of being with others are enhanced in this case not just by the perceived embodiment and immediacy of other individuals, but more importantly by the real possibility of corporeal contact or physical touch. Interacting with

another human being face to face from body to body is the most primitive and essential form of being with others.

In computer-mediated communication under corporeal telecopresence, one's sense of copresence is dampened by the loss of the possibility of haptic engagement. However, the belief that one is in contact with a real human being, although remotely, sustains the social suspense and excitement that underlie face-to-face interaction. Such a belief is constantly being validated based on the behavioral cues (such as voice over the phone and images on the screen) gleaned from the mediated communications.

In human-computer interaction under virtual copresence or virtual telecopresence, users of the interactive media are aware that they are interacting with only technological surrogates of humans (chat bots and embodied agents); nonetheless, they are willing to suspend this disbelief to play along with the game. Sense of copresence in this case is largely a function of the extent to which the surrogates resemble humans and the extent to which the users suspend their disbelief. A doll with a minimum level of resemblance to humans, for example, may provide a lot of companionship to a child who is willing to believe that the doll is a real baby (Dautenhahn & Billard, 2002).

When mode of copresence is given, different interface arrangements can produce different effects on the experience of copresence. Generally speaking, in mediated communication, high levels of embodiment or "media richness" (Daft & Lengel, 1984) enhance users' sense of being with others, which typically culminates in a fully immersive virtual reality environment. The strongest mediated sense of copresence has thus been described as the "perceptual illusion of nonmediation" (Lombard & Ditton, 1997).

A high level of embodiment is not always preferred, though. One of the advantages of a telecopresent condition is that it is possible for users to remain anonymous while communicating with one another. Text-based online chat, for example, is least embodied, yet it is tremendously popular among users of all ages because the disembodiment of interaction enables the interactants to be "simultaneously linked to and buffered from one another" (Sproull and Kiesler, 1991, p. 30). A low level

of media richness, in this case, becomes a desirable interface feature.

In other instances, however, high levels of embodiment are welcomed. When interacting with a representational device on an emotional level in either virtual copresence or virtual telecopresence, individuals would generally like the robotic machines or computer bots to look and act like humans (Breazeal, 2001; Cassell, Sullivan, Prevost, & Churchill, 2000). Humanoid robots and lifelike avatars are often employed to evoke in users a sense of copresence that resembles those obtained in corporeal copresence. Embodiment is usually not a major consideration in designing instrumental robots and bots, for the main objective of such designs is to maximize efficiency rather than intimacy (Norman, 1990). But efforts are now being made to enable robotic entities, such as ATMs, to communicate with humans in natural human language (Kurzweil, 2001). In this way, a sense of copresence can be conveyed even when a user is interacting with a representational device for instrumental purposes.

A strong sense of copresence can also be "paralinguistically" generated in plain text messaging. A text message consists of two major elements: text and paratext. The text element consists of words and punctuation marks as used in normal writing. The paratext element consists of deliberate alterations of spelling ("Come over here sooooon!") and punctuation marks ("You are a liar!!!!!"), and the use of what has come to be known as "emoticons" (Whittle, 1997). Paratext elements have been frequently utilized in instant text exchanges to help telecopresent users express emotions and feelings.

Other interface parameters that may affect users' sense of copresence are level of interactivity, immediacy, and mobility, to name a few. Through manipulation of those factors, a specific type of sense of copresence can be evoked in those who engage in mediated communications.

### 3.2 Copresence Design and Measurement

The distinction between mode of copresence and sense of copresence is particularly useful for understanding the role of copresence design and measurement. Copresence design is essentially a "people as content" presence design (Walker, Bowskill, Hollier, & McGrath, 2000), which focuses on the mode and interface of copresence in the generation of a customized sense of being with others. Recent examples of such work include the designs of "symbolic acting," which uses online avatars to act out the symbolic meaning of a person's activity on a desktop machine; "contact space," where acting avatars indicate a user's availability status so that others can initiate a chance meeting if they want to; and "online public gathering," which allows viewers to see their fellow audience members in the same way as when they watch a TV show together with other people in the same room (Davies & Revett, 1997; Walker et al., 2000). Attempts have also been made to improve the existing technologies of conference calls by adding such features as visual representation, turn taking, chairman control, and private one-on-one chat. The objective of this kind of design is to enhance and enrich users' experience of being with others in mediated settings.

Whereas copresence design works on the conditions of copresence, copresence measurement evaluates the experience of copresence. A copresence measure is essentially a measure of sense of copresence or an evaluation of users' perceptions and feelings of being with others. Sense of copresence can be examined at the interface level, the mode level, or both at the same time. At the interface level, sense of copresence is linked to a particular interface arrangement, and measured and evaluated with regard to that interface (such as text based or voice enabled), and, at the mode level, sense of copresence is tied to a given form of human colocation, and measured and evaluated in relation to that mode of copresence (such as corporeal telecopresence or virtual copresence). It is also possible to measure and evaluate the experience of being with others in a synthetic environment, in which different modes and interfaces of copresence intermingle (Riva et al., 2003).

As different modes and interfaces evoke different senses of being with others, mode- or interface-specific measures of sense of copresence may be needed to capture the effects that are unique to given modes and interfaces of copresence. "Perceptual realism" as a mea-

surement criterion, for example, is useful for evaluating the situation of virtual copresence or virtual telecopresence, where users know that they are dealing with only technological representations of humans. This criterion, however, is not entirely applicable to the measuring of sense of being with others in corporeal telecopresence, for users there operate under the assumption that they are interacting with real, although remote, human beings. In such circumstances, perceptual fidelity becomes a more pertinent measure of the experience of copresence.

## 4    Conclusion

In this paper I have proposed a taxonomy of copresence along with a set of new terms that describe the phenomena of being with others in both mediated and unmediated settings. I would like to point out here that the use of those new concepts in my discussion was mainly for the purpose of maintaining conceptual clarity and consistency, rather than to suggest that other concepts were incorrect. As a matter of fact, many of the ideas I discussed here had existed in the literature under different labels. For example, the phenomenon of telecopresence was to a certain extent captured by the concept of telepresence, which was in some instances subsumed under the category of presence. As a generic concept, presence has been used to describe all mediated experiences of "being there," remotely or virtually and with or without others (Lombard & Ditton, 1997). What I have attempted to do in the present paper is to integrate and synthesize this growing body of literature by offering a systematic categorization of human copresence that can be found in the coming Internet era.

To summarize, I have defined copresence as consisting of two basic dimensions: copresence as mode of being with others, and copresence as sense of being with others. Based on the characteristics of proximity and corporeality of human presence, six modes of copresence, along with a set of interface parameters, have been delineated. Within each mode of copresence, a given type of human interaction takes place, and, in situations in which the interaction involves direct human participa-

tion, a sense of copresence—the perception and feeling of being with others—is formed in the minds of the participating individuals. I have argued that, among all the contributing factors, mode of copresence plays a critical role in affecting sense of copresence. I have also argued that copresence researchers should pay close attention to the linkage between mode of copresence and sense of copresence, for knowledge of how the former affects the latter will be particularly useful for copresence design and measurement.

## Acknowledgments

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