Everyday Telepresence: Emerging Practices and Future Research Directions

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Abstract
As network availability becomes ubiquitous, users are
leveraging this access to establish their presence in remote
locations through the use of commercially available
telepresence technologies. With the increasing adoption of
systems, new questions are emerging about how these
technologies affect user interactions and relationships.
Our goal for this workshop is to bring an interdisciplinary
group of telepresence researchers together to trade
perspectives, fostering new opportunities for collaboration
and to facilitate discussion on how to advance the field.

Author Keywords
Telepresence, computer-mediated communication,
video-mediated communication, teleoperation, virtual
reality, presence

ACM Classification Keywords
H.5.3. [Information Interfaces and Presentation]: Group
and Organization Interfaces – *computer-supported
cooperative work*. H.4.3. Information Systems
Applications: Communications Applications – *computer
conferencing, teleconferencing, and videoconferencing*

Introduction and Motivation
Telepresence technologies—systems that provide the
perception of presence within a physically remote or

simulated site—have recently seen increased adoption in business [11], medical [14], and educational settings [17], spurred by advances in mobile devices, networking, virtual reality, and robotics. The integration of these technologies into people's lives—e.g., using their phones to videochat with friends, receiving care from doctors via telemedical devices, watching a grandson's baseball game over a tablet, attending school from a hospital in a telepresence robot, or holding meetings in virtual board rooms—has opened up a vast new space for future research. As a result, new questions have emerged about how telepresence systems may affect current computer-mediated communication theories, alter user perceptions, influence communicative behaviors, or support distant relationships.

With all of these new questions, research within the realm of telepresence has spread into a number of areas, including work to facilitate the construction of innovative systems (e.g., virtual, mobile, flying, autonomous) [12, 7, 6], the creation of interfaces to support the remote user's capabilities [4, 5], the design of systems for use in specific contexts (e.g., classrooms, dining, stroke treatment) [17, 16, 14], investigations into scenarios that may benefit from these systems [6, 1, 10], and studies to understand how telepresence features affect user interactions [15, 9]. Although these explorations have broadened our understanding and laid a groundwork for the future, their disparate nature has presented barriers to communicating across telepresence domains.

Goals
Our goal for this workshop is to engage researchers and designers across multiple telepresence-related disciplines—including virtual reality, teleoperation, telepresence robotics, mobile telepresence,

computer-mediated communication, video-mediated communication, and telemedicine. This workshop will serve to build common ground for researchers from different backgrounds, allowing them to share their perspectives, methodologies, and results from their own investigations in telepresence, and to promote communication, collaboration, and discussion on how to advance the field.

Discussion Themes
In this workshop, we will focus on four main themes for group discussion.

Theme 1: Design
One of the underlying issues of telepresence design is choosing how to address user needs and provide support for their use of the system [1, 10]. Topics for discussion under this theme include:

- How do we formulate effective design guidelines for future development?
- What user needs does telepresence really meet and what user needs have yet to be addressed?
- What do bystanders of telepresence systems care about, worry about, and need?
- How do different technologies or channels currently support telepresence?
- What are people's expectations of telepresence experiences? Where do those expectations come from?

Theme 2: Methods, Measurements, and Theories
The field of telepresence has matured, growing to include a broad spectrum of research across many domains. As a result, questions have been raised about what telepresence is [3] and how to measure the success of such

systems [13]. In this theme, our goal is to encourage participants to share perspectives and methods. We also seek to answer such questions as:

- What perspectives do different disciplines have on telepresence?
- What are useful tactics for conducting telepresence research?
- What are current or relevant theories related to telepresence?
- What tools do we have for measuring the success of telepresence systems?

Theme 3: Emerging Practices
The increased adoption of telepresence systems in everyday life has changed the way that people communicate, facilitating interactions across large distances. Being able to watch a grandson's baseball game [6] or to spontaneously run into and chat with a remote co-worker in the hall [8] has given rise to new questions about how technology may mediate user relationships, for example:

- What behaviors, habits, and workarounds emerge from real world use of telepresence systems?
- How does the use of these technologies affect the social dynamics between users and non-users?
- How does privacy work in telepresence communications?

Theme 4: Future Telepresence
Past literature in telepresence has highlighted that although current systems struggle to reach parity with face-to-face interactions in many areas, the possibility of granting remote users "superhuman" capabilities is coming within reach [2]. As we look forward into what the future of telepresence may be, we hope to address such questions as:

- Should we grant users capabilities that are "better than human," and if so, what might they be?
- What future are we trying to invent with telepresence?
- What are some of the obstacles to future research in telepresence?
- As telepresence technologies evolve, how will they connect to or benefit from current research?

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