Social Presence in Virtual Event Spaces

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ABSTRACT

It is generally acknowledged that the virtual event platforms of today do not perform satisfactorily at what is arguably their most important function: providing attendees with a sense of social presence. Social presence is the "sense of being with another" and can include ways of knowing who is in the virtual space, how others are reacting to what is happening in the space, an awareness of others' activities and availability, and an idea of how to connect with them. Issues around presence and awareness have been perennial topics in the CHI and CSCW communities for decades. Nevertheless, the time feels ripe for a new effort with a special focus on larger-scale virtual events, given the accelerated pace of change in the socio-technological landscape and the tremendous potential impact that new insights could now have. The goal of this workshop is to bring together researchers and developers from academia and industry with a shared interest in improving the experience of virtual events to exchange insights and hopefully energize an ongoing community effort in this area.

CCS CONCEPTS

• **Human-centered computing** → Collaborative and social computing; Collaborative and social computing systems and tools; Human computer interaction (HCI); Interaction paradigms; Collaborative interaction; Collaborative and social computing; Collaborative and social computing theory, concepts and paradigms.

KEYWORDS

Social presence, Awareness, Virtual conferences, Virtual conventions, Virtual meetings

1 INTRODUCTION

Even before the pandemic, concerns about cost, accessibility, and environmental impact had led many to imagine holding conferences virtually [10, 13, 17, 19]. In 2020, travel restrictions and health concerns associated with COVID-19 added urgency to this interest, as many conventions and smaller meetings found themselves facing the choice of a virtual event or no event at all [1, 15]. Planners scrambled to create virtual events, often experimenting with new technologies and alternative meeting formats. A number of companies created new platforms and services aimed at the virtual events market.

However, despite all this recent attention, it is generally acknowledged that the virtual event platforms of today do not perform satisfactorily at what is arguably their most important function: giving participants a sense of social presence—including ways of knowing who is in the virtual space with them, how other people are reacting to what is happening in the space, what they are doing at any given moment, whether they are busy, interruptible, or available, and how to connect with them.

Of course, issues around "presence" and "awareness" have been perennial topics in the CHI and CSCW communities for decades (e.g. [9]). Nevertheless, the time feels ripe for a new effort with a special focus on larger-scale virtual events, given the accelerated pace of change in the socio-technological landscape and the tremendous potential impact that new insights could now have.

The goal of this workshop is to bring together researchers and developers from academia and industry with a shared interest in improving the experience of virtual events, to exchange insights and hopefully energize an ongoing community effort in this area.

2 BACKGROUND

Supporting interaction at a distance has long been a primary topic within the CHI and CSCW communities. In their 1992 CHI article "Beyond Being There," Hollan and Stornetta suggest that attempts to simply imitate physical proximity through audio and video telecommunication systems are misguided. They argue that researchers

should frame "the telecommunication problem" in terms of needs, media, and mechanisms. This allows technology designers to focus on meeting communication needs without necessarily attempting to recreate the media or mechanisms of a face-to-face interaction. "The goal then becomes identifying needs which are not ideally met in the medium of physical proximity, and evolving mechanisms which leverage the strengths of the new medium to meet those needs" [14].

Building on Hollan and Stornetta's framing, scholars have studied various aspects of the telecommunication problem, focusing on particular communication needs (like achieving common ground [5]), properties of communication media (like having a shared visual context [11]), or mechanisms (like using social activities to build trust [20]). Research addressed these issues at a variety of scales, ranging from short-term dyadic interactions (e.g. [3]) through ongoing communication in sustained teams and communities (e.g. [6]). These issues have been studied in a wide variety of communication contexts that extend beyond the workplace to include families [2], social movements [8], online gaming [7], livestreaming [16], social media [12], and more.

A number of researchers have developed the concept of "presence" in mediated communication. Presence is related to the concept of immersion, but, whereas immersion is a characteristic of technology that allows for realistic experiences that remove people from their physical reality, presence refers to the subjective experience of being in the environment [18]. There are a number of dimensions of presence, but our concern in this workshop is primarily with social presence or "the sense of being with another" [4].

It is precisely this sense of social presence that many find lacking in present-day virtual conferences, virtual meetings, and similar online conventions. In their physical instantiations, such events are characterized by bringing together individuals at a particular time and place around a shared interest. While most are structured around a backbone of formal events (presentations, lectures, demonstrations, structured meetings, etc.), there is also significant value for attendees in the less formal activities including networking, "hallway conversations," social activities, etc.

Mediated interaction in convention-like settings has not been as extensively studied as distributed teams, virtual organizations, or online communities. It is important to recognize that conventions have distinct genres of communication and interaction. While there may be similarities among these genres, we cannot assume that findings about other forms of virtual engagement will translate directly into this space. For example, unlike teams or organizations, the participants at a convention tend to be loosely coupled, and can not be assumed to have aligned goals, shared resources, or common technical infrastructures. Similarly, the shared and delimited time and place of conventions distinguishes them from communities where long-term participation may involve interactions that are more temporally dispersed.

3 THE PROPOSED WORKSHOP

With all this in mind, we argue that:

- Virtual conventions (academic conferences, sales meetings, fan conventions, etc.) have become and will continue to be

an important site for creating and maintaining interpersonal connections;
- A significant portion of the value of conventions resides precisely in their ability to engender social presence—the experience of being with others;
- Supporting social presence remains a challenge for virtual convention organizers and platforms; and
- The past few years have seen significant shifts and advances in relevant technological capabilities (media), convention forms and formats (mechanisms), and the expectations and capabilities of convention attendees (needs).

With all this in mind, we see an opening for bringing together scholars and practitioners working in relevant areas to share experiences, findings, challenges, and best practices, as well as to build consensus around important open research questions and promising approaches.

3.1 POTENTIAL THEMES FOR DISCUSSION

Key thematic areas that we hope to cover at the workshop include the following. (Further discussion topics will of course emerge based on participant submissions and interests.)

3.1.1 Identifying and Characterizing Social Presence Needs.

- What forms of, and what degree of, social presence are required for a successful virtual convention experience?
- How do social presence needs vary across different types of users?
- How do social presence needs vary across different roles at the convention (e.g. presenter vs. facilitator vs. audience member)?
- How do social presence needs vary across different types of conventions or events (e.g. formal presentation vs. informal networking; small groups vs. large groups; etc.)?
- How can platforms support participants as they manage and maintain multiple simultaneous virtual and physical presences (e.g. presence at the virtual convention while also maintaining presence in their remote work environment and presence at home or with family)?
- What are the characteristics of a healthy social network at a virtual convention (for example, the ratio of strong and weak ties).

3.1.2 Characteristics and Capabilities of Virtual Convention Media.

- What level of fidelity (e.g. avatar quality, spacial audio, 3D scenes, etc.) is possible and desired? How does fidelity affect social presence and the effectiveness of interactions?
- What sorts of metaphors work best for fostering interaction?
- How can virtual reality, augmented reality, 3D, and other immersive technologies support social presence?
- Are there promising new media or new combinations of media that better support social presence?

3.1.3 Interaction Mechanisms in Virtual Conventions.

- What is the role of nonverbal communication in supporting social presence?

- What convention practices can better support social presence? For example, are there modes of facilitation (like announcing who is in the room) or event structures (like topical breakout rooms) that produce a greater sense of social presence?
- What are the special difficulties of social presence in hybrid events that involve both virtual and physically co-located participants?

3.1.4 Wellness, Equity, and Inclusion in Virtual Conventions.

- How do we ensure that virtual conventions provide access to all? What can and should be done to enable social presence regardless of ability, infrastructure, cost, location, social identity, etc.?
- Does (or can) increasing the sense of social presence have negative effects for specific participant groups? Does social presence create or amplify vulnerability?
- What is the potential for negative outcomes from social presence technologies? In what ways might social presence technologies empower bad actors? What tools are required to prevent, stop, and recover from bad actions?
- How does social presence affect the overall health of the communities brought together in virtual conventions?

This is not a comprehensive list of topics we may discuss, but represent the breadth and direction of our expected conversations.

3.2 WORKSHOP PLANS

3.2.1 Website. We will create a website advertising the workshop's goals and structure and inviting potential participants to submit position papers. After the workshop, we'll add links to the post-workshop report and updated position papers.

3.2.2 Pre-Workshop Plans. We have already begun reaching out to potential participants to gather ideas both for discussion topics and for other people to contact. We will continue this process between now and the CHI 2022 week, including creating a mailing list for potential participants to exchange ideas both before and after the workshop. We'll also advertise the (possibility of the) workshop in person at CSCW and at the "Meta-Hybrid Workshop on Best Practices for Hybrid Workshops" being organized by the Computing Community Consortium (CCC). While virtual conventions have the potential to alleviate some inclusion and accessibility issues related to travel and physical meetings, they can also present issues of their own. These will be important considerations in our recruitment, and we will develop plans to address any barriers to participation that arise.

3.2.3 In-person, hybrid or virtual-only. We are open to either in-person, hybrid, or fully virtual. Our default will be to follow the lead of the CHI main conference, but we are also sensitive to the fact that the community we hope to gather may extend beyond those that regularly attend CHI (or that will be attending in this rather unusual year), so we will do our best to creatively include remote (perhaps asynchronous) participants in any case. If we do end up hybrid or virtual — and if the choice of platform is not determined for us by CHI organizers — we will give top priority to accessibility and inclusion in selecting our platform. In particular, we will do our best to make sure we have live transcription for remote folks.

Whether we are physical or virtual or both, we plan to have all speakers present live, to encourage discussion.

3.2.4 Asynchronous Engagement. The submitted drafts of all position papers will be online before and during the meeting. We will also set up a text chat channel as a separate "communication band" during the workshop (even if it is all-physical).

3.2.5 Workshop Structure. We envisage a one-day (approximately 6-hour) workshop. Roughly four hours will be devoted to talks (most around 20 minutes, plus one session for one-minute lightning talks), the other two hours to semi-structured discussions and breakouts. The organizing committee may consider offering a longer slot to one "invited speaker", but based on the initial responses from potential participants, it appears more likely that there will be plenty of material to fill four hours just from shorter talks.)

We will put out a call for submissions late in 2021, inviting potential participants to submit two-page position papers describing their perspectives, interests, ideas, and questions. From these submissions, the organizing committee will curate the program of 20-minute talks. Lightning talk slots will be open to all.

Attendance at the workshop will be open to anyone (whether or not they submitted a position paper), subject to CHI's requirement that at least one author of each accepted submission must attend the workshop and that all participants must register for both the workshop and for at least one day of the conference.

Technical requirements: A data projector and screen would be very useful.

Scheduling: Because one of our main goals is seeding an ongoing community around on a new(ish) research theme, we would love to hold the workshop on one of the days *before* the main CHI conference, so that participants can continue to connect and discuss during those days. (We realize there may not be a lot of flexibility here.)

3.2.6 Post-Workshop Plans. We are expecting four forms of outcomes:

- Shared knowledge: Participants will come away from the workshop with a clear sense of the state of play in this area, the current best practices, the most interesting and difficult current challenges, and what technological and conceptual opportunities exist for further progress. Further, they will have a sense of who is working in this area and the loci of expertise across academia, research labs, startups, established companies, etc.
- Communication infrastructure: We will create a mailing list (or other online forum) for discussion before the workshop and for continued engagement afterwards.
- Future workshops: We hope to make this the first in a series, perhaps alternating between CHI and CSCW.
- Documentation: Members of the organizing committee will produce a collaborative post-workshop report summarizing key findings from the day. This report will be distributed together with a collection of (new or updated) position papers from all participants who want to be included, lightly curated by the organizers.

4 ORGANIZERS

We've assembled a relatively large organizing committee, both to seed the workshop with a range of relevant perspectives and to attract potential participants from diverse communities.

Matthew J. Bietz is a lecturer in Informatics at the University of California, Irvine. Distributed collaboration and communication has been a key feature of his research. His dissertation focused on understanding how dyadic communication of critical feedback varied in different communication media. He has also studied distributed collaboration in science and engineering, focusing on issues such as trust, the role of boundary objects, data sharing, and data ethics. He was General Co-Chair of CSCW 2020, the first virtual instance of the CSCW conference.

Nitesh Goyal is Senior Researcher at Jigsaw where he heads user research to make online conversations less toxic, especially for populations that are vulnerable to harassment due to their identity, profession, or beliefs. Previously, his research has focussed on improving remote and virtual collaborations and experts and non-experts as they perform complex data analysis. He has served as Diversity and Inclusion (and Global communities) Co-Chair for multiple ACM CHI Conferences, virtual Co-Chair for CSCW 2020 and will be serving as Technical Program Co-Chair for CHI 2023.

Nicole Immorlica is a senior principal researcher at Microsoft Research New England, co-founder of the virtual event platform Virtual Chair, and chair of ACM SIGecom. Nicole's research lies broadly within the field of economics and computation. Using tools and modeling concepts from both theoretical computer science and economics, Nicole hopes to explain, predict, and shape behavioral patterns in various online and offline systems, markets, and games. Her areas of specialty include social networks and mechanism design. Nicole received her Ph.D. from MIT in Cambridge, MA in 2005 and then completed three years of postdocs at both Microsoft Research in Redmond, WA and CWI in Amsterdam, Netherlands before accepting a job as an assistant professor at Northwestern University in Chicago, IL in 2008. She joined the Microsoft Research New England Lab in 2012.

Blair MacIntyre is a Professor in the School of Interactive Computing in the College of Computing at Georgia Tech, where he directs the Augmented Environments Lab's work on the design and implementation of interactive mixed-reality and augmented-reality environments. He has been working on bringing AR to the web since 2008, when he started the open-source Argon project. His research is currently focused on using distributed, social mixed reality to support online conferences, meetings, and teaching. Over the years, he has worked on programming and design tools for AR, understanding the potential of AR as a new medium for games, entertainment, education and work. He has also investigated military, industrial, and enterprise uses of AR. He has been doing research in augmented reality since 1991, is actively involved with numerous conferences and workshops, speaks and consults regularly, and has published over 100 academic papers in the field.

Andrés Monroy-Hernández leads multidisciplinary research teams that build and study technologies designed to help people connect and collaborate in new ways, a field called social computing. His current interests center around two distinct areas: creating public-interest technology platforms for gig work, and developing social augmented reality experiences. He is the faculty director of the Human-Computer Interaction Lab at Princeton and an assistant professor in Princeton's Department of Computer Science. He is also an associated faculty at Princeton's Center for Information Technology and Policy, a principal research scientist at Snap Inc., and a board member in the non-profit Crisis Text Line.

Benjamin C. Pierce (primary contact) is a professor of computer and information science at the University of Pennsylvania and co-creator of Midspace, an open-source virtual conference platform. He serves on the board of directors of the company that maintains and develops Midspace and assists conferences in deploying it. His passion (and his motivation for working on virtual conferences) is helping to address climate change by reducing the carbon footprint of academia and academic conference culture. His interest in issues relating to social presence was crystallized by his work as executive editor for ACM's 2020 Presidential Task Force Report, Virtual Conferences: A Guide to Best Practices.

Sean Rintel is a Principal Researcher in human-computer interaction exploring the Future of Work at Microsoft Research Cambridge (UK). As a sociologist of communication technology, he investigates how the design of communication technologies interacts with language, action, and culture. He is currently focused on Socially Intelligent Meetings — social and technological interventions for making organizational telepresence effective, comfortable, and adaptable, ranging from traditional videoconferencing to future cross-reality systems. He has been a member of four global category first-place winning projects in Microsoft OneWeek Hackathons. He is/has been a PC member of CHI and CSCW, and reviewed for many HCI and Communication journals and conferences.

Yvette Wohn is an associate professor at NJIT and director of the Social Interaction Lab (socialinteractionlab.com). Her research is in the area of Human Computer Interaction (HCI) where she studies the characteristics and consequences of social interactions in online environments such as livestreaming, esports, gaming, and social media.

5 CALL FOR PARTICIPATION

This workshop will bring together researchers and developers from academia and industry with a shared interest in improving the experience of "social presence" at virtual events, to exchange insights and energize an ongoing community effort in this area. The workshop will be physically co-located (assuming CHI is in-person). The day will be divided between talks, structured discussion, breakout sessions, and informal networking. Individuals who wish to present at the workshop should submit a two-page position statement to Benjamin C. Pierce (bcpierce@cis.upenn.edu). The program of talks will be curated by the organizing committee on the basis of submitted position statements. After the workshop, participants will be invited to update their position papers for inclusion in a post-workshop report. At least one author of each accepted submission must attend the workshop and that all participants must register for both the workshop and for at least one day of the conference. See our website at https://bit.ly/chi22SocialPresence for further information and submission instructions.

ACKNOWLEDGMENTS

REFERENCES

[1] ACM Presidential Task Force on What Conferences Can Do to Replace Face to Face Meetings. 2020. Virtual Conferences, A Guide to Best Practices. https://www.acm.org/virtual-conferences

[2] Rafael Ballagas, Joseph "Jofish" Kaye, Morgan Ames, Janet Go, and Hayes Raffle. 2009. Family Communication: Phone Conversations with Children. In Proceedings of the 8th International Conference on Interaction Design and Children (IDC '09). Association for Computing Machinery, New York, NY, 321–24. https://doi.org/10.1145/1551788.1551874.

[3] Matthew J. Bietz. 2008. Effects of Communication Media on the Interpretation of Critical Feedback. In Proceedings of the ACM 2008 Conference on Computer Supported Cooperative Work. ACM, New York, 467–76. https://doi.org/10.1145/1460563.1460637

[4] Frank Biocca, Chad Harms, and Judee K. Burgoon. 2003. Toward a More Robust Theory and Measure of Social Presence: Review and Suggested Criteria. Presence: Teleoperators and Virtual Environments 12, 5 (October 1, 2003), 456–80. https://doi.org/10.1162/105474603322761270

[5] Jeremy Birnholtz, Thomas A. Finholt, Daniel B. Horn, & Sung Joo Bae. 2005. Grounding Needs: Achieving Common Ground Via Lightweight Chat In Large, Distributed, Ad-Hoc Groups. In CHI '05: Proceedings of the SIGCHI Conference on Human Factors in Computing Systems. ACM, New York, NY, 21-30. https://doi.org/10.1145/1054972.1054976

[6] John M. Carroll, Mary Beth Rosson, Umer Farooq, and Lu Xiao. 2009. Beyond being aware. Information and Organization, 19, 3 (2009), 162–185. https://doi.org/10.1016/j.infoandorg.2009.04.004

[7] Laura Dabbish, Robert Kraut, and Jordan Patton. 2012. Communication and Commitment in an Online Game Team. In Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (CHI '12). Association for Computing Machinery, New York, 879–88. https://doi.org/10.1145/2207676.2208529

[8] Jill P. Dimond, Michaelanne Dye, Daphne Larose, and Amy S. Bruckman. 2013. Hollaback! The Role of Storytelling Online in a Social Movement Organization. In Proceedings of the 2013 Conference on Computer Supported Cooperative Work (CSCW '13). Association for Computing Machinery, New York, NY, 477–90. https://doi.org/10.1145/2441776.2441831

[9] Paul Dourish and Sara Bly. 1992. Portholes: Supporting Awareness in a Distributed Work Group. In Proceedings of the 1992 ACM Conference on Computer Human Interaction (CHI '92). Association for Computing Machinery, New York, NY, 541–47. https://doi.org/10.1145/142750.142982

[10] Hannah Fraser, Kylie Soanes, Stuart A. Jones, Chris S. Jones, and Matthew Malishev. 2017. The value of virtual conferencing for ecology and conservation. Conservation Biology 31, 3 (2017), 540–46. https://doi.org/10.1111/cobi.12837

[11] Susan R. Fussell, Robert E. Kraut, and Jane Siegel. 2000. Coordination of Communication: Effects of Shared Visual Context on Collaborative Work. In Proceedings of the 2000 ACM Conference on Computer Supported Cooperative Work (CSCW '00). Association for Computing Machinery, New York, NY, 21–30. https://doi.org/10.1145/358916.358947

[12] Eric Gilbert. 2012. Designing Social Translucence over Social Networks. In Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (CHI '12). Association for Computing Machinery, New York, NY, 2731–40. https://doi.org/10.1145/2207676.2208670

[13] Matthew H. Holden, Nathalie Butt, Alienor Chauvenet, Michaela Plein, Martin Stringer, and Iadine Chadès. 2017. Academic Conferences Urgently Need Environmental Policies. Nature Ecology & Evolution 1, 9 (September 2017), 1211–12. https://doi.org/10.1038/s41559-017-0296-2

[14] Jim Hollan and Scott Stornetta. 1992. Beyond being there. In Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (CHI '92). Association for Computing Machinery, New York, NY, USA, 119–125. https://doi.org/10.1145/142750.142769

[15] Saadi Lahlou, Roy Pea, Maxi Heitmayer, Martha G. Russell, Robin Schimmelpfennig, Paulius Yamin, Marina Everri, Antoine Cordelois, and Adelaide P. Dawes. 2021. Are we 'Beyond being there' yet? Towards better interweaving epistemic and social aspects of virtual reality conferencing. In Extended Abstracts of the 2021 CHI Conference on Human Factors in Computing Systems (CHI EA '21). Association for Computing Machinery, New York, NY, USA, Article 462, 1–6. https://doi.org/10.1145/3411763.3451579

[16] Zhicong Lu, Michelle Annett, and Daniel Wigdor. 2019. Vicariously Experiencing it all Without Going Outside: A Study of Outdoor Livestreaming in China. Proc. ACM Hum.-Comput. Interact. 3, CSCW, Article 25 (November 2019), 28 pages. https://doi.org/10.1145/3359127

[17] Benjamin C. Pierce, Michael Hicks, Crista Lopes, and Jens Palsberg. 2020. Conferences in an era of expensive carbon. Commun. ACM 63, 3 (March 2020), 35–37. https://doi.org/10.1145/3380445

[18] Mel Slater and Sylvia Wilbur. 1997. A Framework for Immersive Virtual Environments (FIVE): Speculations on the Role of Presence in Virtual Environments. Presence: Teleoperators and Virtual Environments 6, 6 (December 1, 1997), 603–16. https://doi.org/10.1162/pres.1997.6.6.603

[19] Christopher J. Welch, Sanjoy Ray, Jaime Melendez, Thomas Fare, and Martin Leach. 2010. Virtual Conferences Becoming a Reality. Nature Chemistry 2, 3 (March 2010), 148–52. https://doi.org/10.1038/nchem.556

[20] Jun Zheng, Elizabeth Veinott, Nathan Bos, Judith S. Olson, and Gary M. Olson. 2002. Trust without touch: jumpstarting long-distance trust with initial social activities. In Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (CHI '02). Association for Computing Machinery, New York, NY, USA, 141–146. https://doi.org/10.1145/503376.503402