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Augmenting Social Presence in VR Meetings

Katherine Isbister*, Joshua McVeigh-Schultz^, Anya Osborne*, Victor Li*
*University of California Santa Cruz
^San Francisco State University

Our research team has been working for the last couple of years on how we can enhance designed support for connection and collaboration in virtual meetings. Specifically, we have had a focus on Virtual Reality (VR), and taking a Research through Design (RtD) approach to building prototypes of design support for workplace meetings between people who already know each other. To build toward this work, we have also been doing a close read of current social VR meeting spaces to understand what sorts of design choices are worth emulating and enhancing and where there are important gaps to address [19,25] . The work initially began with a postdoc funded by Mozilla, and is currently funded by the National Science Foundation, as a collaboration between research teams at the University of California Santa Cruz (PI Isbister) and San Francisco State University (PI McVeigh-Schultz). We feel this work is relevant to the workshop's theme of supporting social presence in virtual event spaces, and we are excited to join in the dialog about this topic.

Research on distributed meetings has documented numerous obstacles faced by participants in these meetings such as reduced trust and feelings of isolation [6,7], reduced engagement due to multi-tasking [22], lack of cues causing difficulty in jumping into the conversation [15]), and reduced awareness of other participants' presence and understanding [14,35]. Some of these challenges for meetings may be addressed by richer—or alternative—forms of embodiment offered by social VR (and XR) [27,30,31,34,36]. Social VR, unlike traditional screen-based remote meetings, not only supports aspects of embodied awareness (e.g. a heightened experience of social presence [32]), but also enables new forms of social augmentation that exceed what is possible in face-to-face contexts. For example, research on social interaction in VR—in particular Bailenson [1,2,3,4,5]—has demonstrated how interventions in VR environments can shape or augment social interaction. More recent research by Roth and others explores social augmentations that manipulate or augment non-verbal social cues in VR [8,9,10]. This existing work in the area of TSI and social augmentation in social VR has, thus far, focused largely on design interventions at the level of individual perception (i.e. individuals perceive differently which, in turn, impacts social behavior).

By contrast, our approach emphasizes the transformative potential of social affordances [8,9,12,16,17,19,23,24,25], *perceived simultaneously by multiple participants.* Thus, despite the important contributions of the work above, we argue that these sorts of studies miss opportunities for more radical departures from familiar models of embodied communication. Our research on this topic—see especially [16,17,23,24] for an overview of this approach—points to opportunities for novel social affordances to unleash new collective capacities. Here we build on established techniques for social augmentation in HCI [6,10,11,18,20,21,26,33] and adapt these approaches to take advantage of the unique affordances of social VR [12,23,24].

Gibson's concept of affordance models human perception in relation to the action capacities of an embodied subject in the physical world for an embodied subject [13]. Likewise, social affordances represent an ecological approach to social interaction whereby the interactive features of bodies, artifacts, and environments all become potential resources for social mediation. In the physical world, for example, we can conceive of the social affordances of whiteboards, projectors, microphones, name tags, sticky

notes, and other props that can be passed from hand to hand (some of the very ones that current VR meeting spaces aim to mirror). Our aim is to create digital mediating artifacts that can operate as ‘suprahuman’ technologies [16], transforming the ways that humans can interact with one another and enabling new kinds of social coordination to emerge.

We see a promising opportunity to design social augmentations that take advantage of the unique affordances of VR by turning environmental and embodied features into visualizations of social data. Beyond replication of real-world props, we aim to leverage new embodied capacities, new social artifacts, and new environmental features in order to augment social signalling and unlock new social affordances—or what we have come to think of as “social superpowers”—in VR [23,24]. Along these lines, we identify areas where social cues can be heightened in ways not typically possible in the physical world. These include: (1) social data visualization as a living feature of the environment, (2) alternative social geometries that expand our sense of embodied relationships in space, and (3) new forms of embodied communication that facilitate unfamiliar social rituals (see [23]).

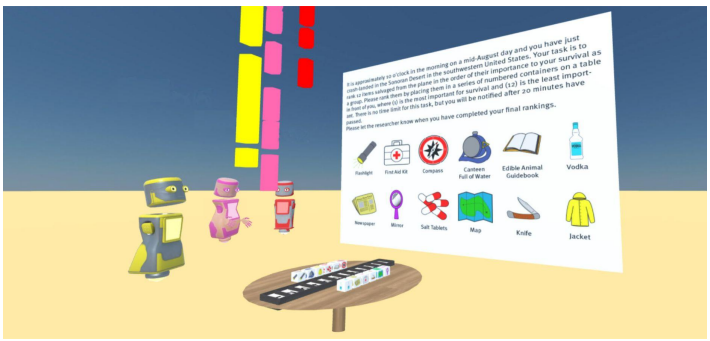

Figure 1. Conversation visualization prototype, built using Mozilla’s VR tools, shows length of talk turns in real time with elongated cylinders rising above the conversation group as they speak.

We would be happy to present examples of our RtD prototypes at the Workshop, and to briefly present results of our research thus far, toward seeding discussion of how we might all improve the quality of social presence in virtual events, whether in VR or other formats. We will be showing one of our prototypes (a conversation balance visualization, see Figure 1) in the CHI 2022 Interactivity exposition, and could bring headsets to the event to allow workshop participants to experience the augmentation. Since the prototype is built using a custom Hubs Cloud (a fork of the Mozilla Hubs social VR platform), it would also be possible for remote participants to try out the visualization in the same VR space as people in the room.

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