

Beyond ‘Same Time, Same Place’: Introduction to the Special Issue on Collocated Interaction

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INTRODUCTION

Despite the rise of social media and online communication, face-to-face interaction retains its prominence in human life. Being face-to-face with others is “the most human thing that we do” (Turkle, 2015, p. 3), it is richly organised (Goodwin, 1979), and essential to sustaining social relationships (Nardi and Whittaker, 2002). As Boden memorably put it, face-to-face interaction is “the world as it happens” (Boden, 1990).

When people meet, we find varied technologies at play, spanning, connecting, and sometimes interrupting those face-to-face interactions. Yet with the growing sophistication of networked apps and services in recent years, the role of these face-to-face interaction in HCI research has diminished somewhat. Supporting distance (Olson and Olson, 2000) with new kinds of distributed collaborative systems has become central. Studies and analysis of social media and social networking (Golbeck, 2013), crowdwork (Kittur et al., 2013), and collaborative editing (Panciera, Halfaker, and Terveen, 2009) have risen in prominence. What role then is left for studying and designing for collocated interaction? Should collocated interaction be considered a matter for the past, important

for a time where there were clearly delineated workplace technologies and neat time-place taxonomies, but unfit for contemporary blendings of work, leisure and mobility?

We would argue that this is not the case. Our goal for this special issue has been to rekindle research into collocated interaction, to argue for its continued importance for HCI. Ellis, Gibbs and Rein (1991) characterised this area as “same time / same place” technology use. However, the work in this special issue and our own experiences suggest a more complex picture: our research in diverse areas such as disaster response (Fischer et al., 2015), systems to support collocated display and wearable sharing (Lucero et al., 2013; Lucero et al., 2016), conversation around mobile phones (Brown, McGregor, and Laurier, 2013), co-present discussions around social media as it is consumed and produced (Reeves and Brown, 2016), and working with Internet of Things data in the home (Fischer et al., 2016a, 2017) makes clear, technology use in our contemporary co-present milieu significantly complicates this notion of ‘same time, same place’. People wear and carry more devices than ever, creating fragmented “device ecologies” (Bardram and Bossen, 2005) that blend the co-present with those distant, a form of “perpetual contact” (Katz and Aakhus, 2002) or “dwelling” (O’Hara et al., 2014), generating new ways of socialising with each other, such as “channel blending” (Isaacs et al., 2012), or the “threading” of technology with everyday interactions (Brown, McGregor and Laurier, 2013).

Research on collocated interaction broadly falls into two areas: *systems design for collocated interaction*, such as developments in single display groupware (Stewart et al., 1999); and *studies of collocated interaction*, originating in studies of work technology in “centres of coordination” (Suchman, 1997) such as control rooms.

Overall, this special issue brings together research that is concerned with rethinking methodologies, the conduct of studies, and new designs—together it shapes a new research agenda that goes beyond ‘same time, same place’, offering new ways of thinking about the co-present in HCI research.

ARTICLES IN THIS SPECIAL ISSUE

We now summarise the articles in this special edition. Each brings together these issues in distinctive ways, spanning both design and studies of co-present interaction.

Using ‘slideware’ and its use in design meetings, Chattopadhyay, Salvadori, O’Hara, and Rintel set up a naturalistic experiment. They investigate the local distribution of novel presentation controls and slide review amongst copresent members of a meeting (e.g., the slideware offers the ability for non-presenters to skip back slides or privately review slides on their own device). Chattopadhyay et al. explore how such slideware systems impact (and are impacted by) the organisation of conversation and bodily action. They discuss various ways in which this technology offers opportunities for co-present meeting attendees, such as in seeking clarification, or locating a slide to jointly discuss in a future moment while the presenter continues. This paper offers a clear example of how collocated systems design may be evaluated in terms of its pragmatic affordances, and the ways that such systems come to be interwoven with talk and bodily actions that animate the effect of particular design choices.

Ciolfi and McLoughlin present an observational study of a heritage site that has been augmented with various interconnected place-specific interactive components. The paper uses an existing Computer-Supported Cooperative Work (CSCW) design framework for crafting ‘assemblies’ of digital technologies to enhance / support cultural spaces, and in

doing so revisits and extends the Assembly framework (Fraser et al., 2003). In locating this paper within the special issue, Ciolfi and McLoughlin highlight the relevance of a significant extant body of work in CSCW and HCI that has been concerned deeply with collocated interactions in cultural and heritage spaces.

Luff, Heath, Patel, vom Lehn, and Highfield start their article by revisiting some seminal CSCW research on collocated interaction, reviewing but also reconsidering concepts and understandings of centres of collaboration (e.g., control rooms). The authors present an ethnography of a centralised London city control centre, a complex and large control room that brings together different city management functions. Rather than addressing notions of the ‘smart city’, the authors instead document how a rather mundane artefact—a shared digital incident log—was used in the infrequent collaborations that the control room environment enabled. This piece updates our understandings of contemporary control rooms, recontextualising key foundational work that helped HCI develop many of the core concepts that now loom large in understanding co-present interaction.

Crowell, Mora Guiard, and Pares document how systems can support those with Autism Spectrum Disorders (ASD), specifically in full-body interaction games where children with ASD can practice key social skills with their peers. Through a review of three large-display based games, the authors discuss how the representation of the user themselves affects ASD children’s engagement in the game itself. Different visualisations of the self produce very different outcomes for ASD users who prove to be particularly sensitive to how they are represented or ‘mirrored’ in the game. Drawing specific and well-grounded findings for the future design of these systems, the strength of this paper is in how it locates a pertinent feature of co-present interaction while drawing on research in non-digital settings to help us understand the new outcomes we see here.

Combining collocation and an emerging research topic, Hosio, Goncalves, van Berkel, Klakegg, Konomi, and Kostakos explore facilitating collocated crowdsourcing. Situated crowdsourcing extends the traditional idea of distributing online work as small repetitive tasks by applying it to a collocated situation. Consisting of circular table, three touch display terminals, and a crowdsourcing platform, TeamSourcer allows multiple workers to perform distributed tasks in a face-to-face setting. In a study where solo versus collocated work were compared, differences in performance, collaboration strategies, and the effect of team familiarity were found. In being the first to focus solely on collocated crowdsourcing in teams, the authors highlight a variety of new research opportunities.

In examining the work of hearing aid tuning between a patient and an audiological consultant, Dahl and Hanssen examine how collocated interactions between patient and practitioner involve negotiating a shared sense of ‘what is being heard’ (or not heard). Dahl and Hanssen contrast this existing setting with the results of a technological intervention (an interactive tabletop to support tuning work). They demonstrate the ways in which design to support collocated interaction can improve tuning outcomes. Dahl and Hanssen’s paper contributes a novel slant on the topic of collocated interaction by considering aural matters specifically, combined with a user-centred design process.

Derived from several years of research on collocated settings Martinez-Maldonado, Kay, Shum, and Yacef explore the challenges associated with mining data derived from studying technology use in (variously) shared displays, interactive tabletops, connected device ecologies (e.g., tabletops, projections, laptops), and specialist simulator devices. This kind of data—clickstreams, system logs, audiovisual recordings, time-on-task, etc.—presents various challenges for analytic tools, which Martinez-Maldonado et al.

make into a salient set of principles and dilemmas for future tool designers. The paper offers a unique contribution to this special issue in that it tackles some of the practical problems particular to studying collocated interactions, and in doing so further illuminates the nature of collocated interaction itself.

Licoppe and Figeac present findings from video analysis of temporal organisation of gaze switches between mobile phone use and the environment in transport situations (driving and commuting). The study provides an understanding of how users jointly manage mobile device use with seemingly competing activities such as driving. Users achieve this by displaying sensitive forms of “attunement to the potential sequential implicativeness of events occurring on screen or in the mobility environment” (Licoppe and Figeac, p. 1) This attunement, the authors show, enable users to gracefully integrate mobile device use and driving. In turn, the authors reflect on the ‘texture’ of user interfaces as offering opportunities for gaze switching, and how this might be exploited to influence the “sequential properties” to facilitate use in multi-activity settings.

Finally, the guest editors hope that this special issue provides impetus to conduct research and design in full view of the range of issues at play in collocated interaction, and refocuses and restates collocated interaction as a major topical interest for HCI and CSCW.

NOTES

Background. This special issue arose from a series of workshops, and is thus indebted to the participants and the community they helped to create, including most recently at CSCW (Fischer et al., 2016b).

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REFERENCES

- Bardram, J. E., & Bossen, C. (2005). Mobility work: The spatial dimension of collaboration at a hospital. *Computer supported cooperative work (CSCW)*, 14(2), 131-160. <http://dx.doi.org/10.1007/s10606-005-0989-y>
- Boden, D. (1990). The world as it happens: Ethnomethodology and conversation analysis. In G. Ritzer (ed.), *Frontiers of Social Theory: The New Synthesis* (pp. 185–213). Columbia University Press.
- Brown, B., McGregor, M., & Laurier, E. (2013). iPhone in vivo: video analysis of mobile device use. *Proceedings of the CHI 2013 Conference on Human Factors in Computing Systems* (pp. 1031-1040). New York: ACM. <https://doi.org/10.1145/2470654.2466132>
- Ellis, C. A., Gibbs, S. J., & Rein, G. (1991). Groupware: some issues and experiences. *Communications of the ACM*, 34(1), 39-58. <http://dx.doi.org/10.1145/99977.99987>
- Fischer, J. E., Crabtree, A., Colley, J. A., Rodden, T., & Costanza, E. (2017). Data work: how energy advisors and clients make IoT data accountable. *Computer Supported Cooperative Work (CSCW)*, 26(4-6), 597-626.
- Fischer, J. E., Crabtree, A., Rodden, T., Colley, J. A., Costanza, E., Jewell, M. O., & Ramchurn, S. D. (2016a). “Just whack it on until it gets hot”: Working with IoT Data in the Home. *Proceedings of the 2016 CHI Conference on Human Factors in*

- Computing Systems* (pp. 5933-5944). New York: ACM.
<https://doi.org/10.1145/2858036.2858518>
- Fischer, J., Porcheron, M., Lucero, A., Quigley, A., Scott, S., Ciolfi, L., Rooksby, J., & Memarovic, N. (2016b). Collocated interaction: new challenges in 'same time, same place' research. *Proceedings of the 2016 CSCW Conference on Computer Supported Cooperative Work and Social Computing Companion* (pp. 465-472). ACM. <https://doi.org/10.1145/2818052.2855522>
- Fischer, J. E., Reeves, S., Rodden, T., Reece, S., Ramchurn, S. D., & Jones, D. (2015). Building a birds eye view: Collaborative work in disaster response. *Proceedings of the CHI 2015 Conference on Human Factors in Computing Systems* (pp. 4103-4112). New York: ACM. <http://dx.doi.org/10.1145/2702123.2702313>
- Fraser, M., Stanton, D., Ng, K. H., Benford, S., O'Malley, C., Bowers, J., Taxén, G., & Ferris, K. (2003). Assembling History: Achieving Coherent Experiences with Diverse Technologies. *Proceedings of the ECSCW 2003 European Conference on Computer-Supported Cooperative Work* (pp. 179-198). Norwell, MA: Kluwer.
- Golbeck, J. (2013). *Analyzing the Social Web*. Elsevier.
- Goodwin, C. (1979). The interactive construction of a sentence in natural conversation. In G. Psathas (ed.), *Everyday Language: Studies in Ethnomethodology* (pp. 97-121). New York: Irvington Publishers.
- Isaacs, E., Szymanski, M., Yamauchi, Y., Glasnapp, J., & Iwamoto, K. (2012). Integrating local and remote worlds through channel blending. *Proceedings of the CSCW 2012 Conference on Computer-Supported Cooperative Work* (pp. 617-626). New York: ACM. <https://doi.org/10.1145/2145204.2145299>
- Katz, J. E., and Aakhus, M. (2002). *Perpetual contact: Mobile communication, private talk, public performance*. Cambridge University Press, 2002.
- Kittur, A., Nickerson, J. V., Bernstein, M., Gerber, E., Shaw, A., Zimmerman, J., ... & Horton, J. (2013). The future of crowd work. *Proceedings of the CSCW 2013 Conference on Computer-Supported Cooperative Work* (pp. 1301-1318). New York: ACM. <https://doi.org/10.1145/2441776.2441923>
- Lucero, A., Clawson, J., Fischer, J., & Robinson, S. (2016). Mobile collocated interactions with wearables: past, present, and future. *mUX: The Journal of Mobile User Experience*, 5 (1), 6. <http://dx.doi.org/10.1186/s13678-016-0008-x>
- Lucero, A., Jones, M., Jokela, T., & Robinson, S. (2013). Mobile collocated interactions: taking an offline break together. *interactions*, 20(2), 26-32.
<https://doi.org/10.1145/2427076.2427083>
- Nardi, B. A., & Whittaker, S. (2002). The place of face-to-face communication in distributed work. In P. Hinds & S. Kiesler (eds.), *Distributed Work* (pp. 83-110). Cambridge, MA: MIT Press.
- O'Hara, K. P., Massimi, M., Harper, R., Rubens, S., & Morris, J. (2014). Everyday dwelling with WhatsApp. *Proceedings of the CSCW 2014 Conference on Computer-Supported Cooperative Work & social computing* (pp. 1131-1143). New York: ACM. <http://dx.doi.org/10.1145/2531602.2531679>
- Olson, G. M., & Olson, J. S. (2000). Distance matters. *Human-computer interaction*, 15(2), 139-178. http://dx.doi.org/10.1207/S15327051HCI1523_4
- Pancieria, K., Halfaker, A., & Terveen, L. (2009). Wikipedians are born, not made: a study of power editors on Wikipedia. *Proceedings of the GROUP 2009*

- Conference on Supporting group work* (pp. 51-60). New York: ACM.
<http://dx.doi.org/10.1145/1531674.1531682>
- Reeves, S., & Brown, B. (2016). Embeddedness and sequentiality in social media. In *Proceedings of the CSCW 2016 Conference on Computer-Supported Cooperative Work & Social Computing* (pp. 1052-1064). New York: ACM.
<https://doi.org/10.1145/2818048.2820008>
- Suchman, L. (1997). Centres of Coordination: A Case and some Themes. In L. B. Reisnick, R. Saljo, C. Pontecorvo & B. Burge (Eds.), *Discourse, Tools, and Reasoning: Essays on Situated Cognition* (pp. 41-62). Berlin: Springer-Verlag.
- Stewart, J., Bederson, B. B., & Druin, A. (1999). Single display groupware: a model for co-present collaboration. *Proceedings of the CHI 1999 Conference on Human Factors in Computing Systems* (pp. 286-293). New York: ACM.
<http://dx.doi.org/10.1145/302979.303064>
- Sherry Turkle. 2015. *Reclaiming conversation: The power of talk in a digital age*. Penguin.

ARTICLES IN THIS SPECIAL ISSUE

- Debaleena Chattopadhyay, Francesca Salvadori, Kenton O'Hara & Sean Rintel (2017). Beyond Presentation: Shared Slideware Control as a Resource for Collocated Collaboration, *Human-Computer Interaction*, <volume>, <pages>.
- Luigina Ciolfi & Marc McLoughlin (2017). Supporting Place-Specific Interaction through a Physical/Digital Assembly, *Human-Computer Interaction*, <volume>, <pages>.
- Ciera Crowell, Joan Mora-Guiard & Narcis Pares (2017). Impact of Interaction Paradigms on Full-Body Interaction Collocated Experiences for Promoting Social Initiation and Collaboration, *Human-Computer Interaction*, <volume>, <pages>.
- Yngve Dahl & Geir Kjetil Hanssen (2017). "Do You See What I Hear?": Designing for Collocated Patient-Practitioner Collaboration in Audiological Consultations, *Human-Computer Interaction*, <volume>, <pages>.
- Simo Hosio, Jorge Goncalves, Niels van Berkel, Simon Klakegg, Shin'Ichi Konomi & Vassilis Kostakos (2017). Facilitating Collocated Crowdsourcing on Situated Displays, *Human-Computer Interaction*, <volume>, <pages>.
- Christian Licoppe & Julien Figeac (2017). Gaze Patterns and the Temporal Organization of Multiple Activities in Mobile Smartphone Uses, *Human-Computer Interaction*, <volume>, <pages>.
- Paul Luff, Christian Heath, Menisha Patel, Dirk vom Lehn & Andrew Highfield (2017). Creating Interdependencies: Managing Incidents in Large Organizational Environments, *Human-Computer Interaction*, <volume>, <pages>.
- Roberto Martinez-Maldonado, Judy Kay, Simon Buckingham Shum & Kalina Yacef (2017). Collocated Collaboration Analytics: Principles and Dilemmas for Mining Multimodal Interaction Data, *Human-Computer Interaction*, <volume>, <pages>.