

Special issue: presence

Phil Turner · Cheryl Campanella Bracken

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This special issue of AI and Society on presence features papers that were presented at the 13th annual International Workshop on Presence, which was held in Edinburgh. These papers represent the wide variety of disciplines that continue to be applied to the study of presence ranging from computer science, to classical studies, psychology, neuroscience and communication. As digital technologies continue their relentless spread to so very many aspects of our everyday lives, the experience of presence is becoming a unifying basis for reasoning about and evaluating these developments.

This special issue comprises eight papers that have been grouped into three sections. The first two papers, while being closely related, differ with respect to their treatment of the authenticity of the virtual environments that they describe. The next two papers report studies of social presence. The final tranche of papers address presence in different forms of media.

In the first section, the papers examine applications of presence. The paper by *Benyon* and his colleagues offers an introduction to what they describe as digital tourism. They begin by noting that tourism is a global industry worth billions. Digital tourism is concerned with the use of digital technologies such as augmented reality to enhance the experience of being-there and being-there with other people. The authors offer a number of design scenarios (exemplars)

of how this might be implemented. In the first example, the House of Edgar Allen Poe has the tourist experiencing an enhanced visit by way of their mobile phone. The Brick City Tours offers an alternate vision by offering digital enhancement, before, during and after a visit. An interesting feature of the after visit supports being personalised mementoes of the trip. These digital enhancements are deemed to involve the creation of blended spaces, that is, the seamless experience of the real and the virtual—a notion that might have puzzled Descartes. The vision offered by this paper is faced with an interesting and unexpected counterpoint in the next paper—Time.deltaTime.

Fredrick's Time.deltaTime raises a host of issues for presence researchers and those engaged in building digital applications intended to create a sense of being-there. Fredrick's interest is primarily in the re-creation of places of historic and archaeological interest. Digital technology can be used to create or recreate representations of the historic (e.g. ancient Egypt), culturally significant but physically fragile (Machu Picchu) and the inaccessible (the surface of Mars, the bottom of the Pacific). The implications for tourism, archaeology, education and so forth are significant. However, this unconstrained enthusiasm stands in contrast to the aims of the London Charter which calls for the adoption of international standards for intellectual integrity, transparency, sustainability and access in 3D modelling for cultural heritage. Fredrick, echoing the intent of the London Charter, observes that it is simply too easy, when using software tools, to over-embellish a representation of, say, ancient Pompeii. By way of further example, he notes the many anachronisms and errors in Ubisoft's best-selling games—*Assassin's Creed*—which is set in what purports to be an historic Venice. From their reconstruction of the Piazza and Basilica, San Marco Fredrick suggests that the designers may not have read the London Charter. The sheer

P. Turner (✉)
School of Computing, Edinburgh Napier University,
10 Colinton Road, Edinburgh Eh10 5DT, Scotland, UK
e-mail: p.turner@napier.ac.uk

C. C. Bracken
School of Communication, Cleveland State University,
2121 Euclid Avenue, MU 223, Cleveland, OH 44115, USA
e-mail: c.bracken@csuohio.edu

power and availability of game engines to create and publish immersive content poses fundamental challenges to the emphasis on data-driven visualisation and transparency as expressed in the London Charter. At the same time, recognition is growing within the academic community that commercial games can serve as teaching platforms of enviable power and market penetration. It will be interesting to see whether academic integrity and commercial interest will prevail.

The next two papers examine sensations of social presence and focus on interactions between individuals by way of communication technologies. Specifically, *Booch and Watts* examine the use of communication technologies as factors in long-distance relationships in particular. They observe that the type of communication technology and the goal of the communication vary with the type of relationship people have with one another. A distinguishing aspect of this study is that participants provided self-reports over 21 days of interactions with a particular person with whom they have a relationship (either at a distance or in the same location), resulting in impressive 988 contact reports. Participants reported that the use of different media influenced their sense of social presence and closeness. Further, the type of relationship and location of their partner also influenced the reported level of social presence and closeness. Interestingly, synchronous and visual encounters (telephone and Skype) were rated almost as highly as face-to-face interactions with romantic partners. The reported levels of social presence were strongly influenced by the proximity of their relational partner. In long-distance relationships, the reported sense of social presence increased across all communication media.

Nowak's paper is an examination of the selection of self-presentation and reported sensations of social presence. This is an area of continuing research for Nowak who has studied avatar selection and credibility for some time. The reported study explores the experience of how people represent themselves in instant messaging interaction. Participants provided their “Buddy icon” and then evaluated its gender and intended social presence. The results suggest that men and women represent themselves differently in online interactions and the use of photorealistic images leads to higher levels of intended social presence. Instant message users indicate that a human Buddy Icon would help others feel a stronger sense of social presence during their instant messaging interaction.

The next four papers are linked by their focus on presence and media while demonstrating the diversity of this domain by their very different methodologies, assumptions and theoretical perspectives.

Decock, Van Looy, Bleumers and Bekaert's quasi-experiment investigates how being immersed in a virtual environment influences participants' experience of a

theatrical performance. The authors use omnidirectional video to explore tele-presence experiences. The case study observes a performance of CREW—a theatre company that blends art and science in immersive settings. The installation observed was Cave Automatic Personal Environment, which is designed to give participants a feeling of being inside another body, place or time dimension. The results highlighted the importance of identification as an important variable in the study of presence and enjoyment.

McGregor's paper poses a very simple question, “Do we experience what sound designers intend us to hear?” McGregor tells us that this is an unknown, with no existing work specifically addressing this question. Further, there is no agreed vocabulary or taxonomy of listening experiences, as designers have created a myriad of nuanced terms to describe the listening experience—all of them different, and all of them a matter of individual, expert judgement. His approach is to deal with two problems simultaneously. McGregor's use of the repertory grids (rep grids) interviewing technique is novel. Rep grids are based on Kelley's personal construct theory which, in brief (as the original work runs to two volumes), argues that each of us tries to make sense of the world as we experience it, and we do this by constantly forming and testing hypotheses about it. By the time we reach adulthood, we will have developed a very complex model of the world and our place in it: this model is, according to Kelly, our personality. The use of repertory grids allows us to examine these hypotheses we have formed and can be used to examine our responses (from our repertoire) to other situations, such as, in this instance, pre-recorded soundscapes. McGregor's use of selected constructs also allows him to avoid the problem of a standard vocabulary when describing the listening experience. Although he describes his work as exploratory, he has been able to determine whether listeners do actually hear what the sound designer had intended.

Another reoccurring concern is the measurement of the component elements of presence. *Bracken, Pettey and Mu* re-examine the use of secondary task reaction time (STRT) as a viable technic for studying presence. In an experiment, they correlated the STRT and self-report presence measures. The results suggest that this objective measure may be promising for future presence research.

Finally, *Turner and Turner* propose an alternate solution to the “book problem” in their *The “Book Problem”* and its Neural Correlates. Biocca identified this problem more than a decade ago when he observed that books were a good source of tele-presence. Books themselves comprise (essentially) black marks on white paper and lack all the hallmarks of a good immersive experience, save for the fact that they work exceedingly well. Biocca contrasted the experience of presence we all enjoy in real world with the somewhat attenuated experience in a virtual environment

with what a book can provide. Biocca's solution to the book problem was to invoke mental imagery which is missing from the then current account of presence. The Turners challenge this by observing that Biocca had confined himself to a discussion of spatial presence and had failed to address the issue of engagement. Their solution also involved imagery, but this time *motor imagery*. They note the observation of neuroscientists that the same parts of the brain are active (and hence have a role in) when we are engaged in the world, imagine those same actions in the world, dream about those actions, observe others performing

those actions and, finally, read about those actions. Together, these observations have resulted in a simulation and emulation accounts of motor behaviour but also provide an excellent basis for accounting for the book problem.

What has emerged from these papers and from the conference itself is that presence research is being conducted at many different levels of abstraction ranging from purely theoretical work, through psychophysical experiments, to matters of ethics and integrity, basic design issues and the practical applications of this research.