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Editorial
Special Issue: Presence and Interaction
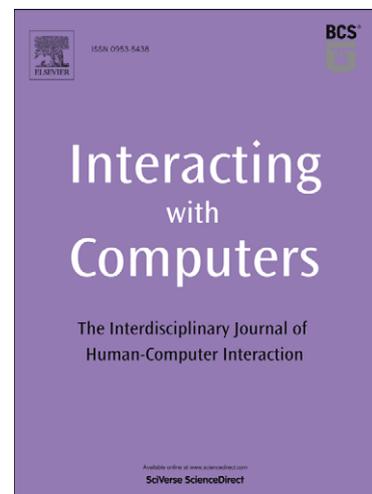
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Introduction

As researchers and practitioners we have been exploring the topic of presence, and in particular the contribution of the sense presence to interactive experiences, for several years. We have learned that the user experience of information technology is profoundly affected by the extent to which we experience ourselves to be really present in the mediated world that the technology makes available to us.

Over the last two decades, many researchers, artists and designers have explored the role of the sense of presence in interactive experience (so-called 'mediated presence'). While there is still not a general consensus about what presence actually is, it is fair to say that most investigators agree about what it is not. Presence is not the degree of technological immersion, it is not the same thing as emotional engagement, it is not absorption or attention or action; but all of these and several other factors have a potential role in understanding the experience of presence in interaction.

It is also generally agreed that the feeling of presence (originally and still sometimes called "tele-presence"), is a crucial aspect of many recent and developing interactive technologies. We see this illusion of being present as the key ingredient that gives interactive media the power to affect people profoundly, and even change them. We see this happening in diverse areas such as psychotherapy, training, education, entertainment and the arts.

Due to the complexity of the topic, and the interest in this concept, many different attempts to define presence and to explain its role are available in the literature. In general, the first and most basic distinction concerns the issue of technology. One group of researchers describes the sense of presence as "Media Presence", a function of our experience of a given medium. The main result of this approach is the definition of presence such as the "*perceptual illusion of non-mediation*" produced by means of the disappearance of the medium from the conscious attention of the subject. A second group of researchers considers presence as "Inner Presence", a broad psychological phenomenon, not necessarily linked to the experience of a medium, whose goal is the control of the individual and social activity. In this second view the natural, unmediated sense of presence is grounded in perception, and natural perception is coupled with action and the body, so the experience of presence in a technologically-mediated environment is to some extent a function of the possibilities for interaction. But unlike in the real world, the extent

to which presence is experienced in an interactive context can be manipulated by design, in almost unlimited ways.

With its roots in the development of virtual reality technology, the study of presence has expanded into a range of application disciplines, such as psychotherapy, pain control, media studies, education, entertainment, the arts, data exploration, physiotherapy and sports training, and more. One of the most refreshing and stimulating aspects of presence research is the diversity of views and approaches brought to bear on its explanation and exploration, and this diversity is certainly reflected in the papers accepted for publication in the current issue.

Even though the editors have a particular position in the debate between "Media Presence" and "Inner Presence", they selected the best papers independently from the vision addressed by the authors. Our intention in this special issue is to give to the readers the last word about what is the best approach to deal with this fascinating topic.

As well as the editors, a large number of reviewers contributed to the quality of the special issue, through their incisive comments and constructive suggestions for improvements to papers. We are very grateful to them (see the complete list at the end of this article).

Contents of the Special Issue
In response to our call for papers, we received a total of 25 submissions by the time of the deadline. These were subjected to a two-stage review process. In the first stage, at least three peer reviewers assessed each manuscript, and recommended whether it be accepted as it is, accepted with detailed suggested improvements, or rejected. These reviews were passed to one of the special issue editors, who decided on the overall response to the authors (except for papers authored by one or more of the special issue editors, which were reviewed independently by external reviewers selected by the journal editor). In the second stage, the re-submitted papers were reconsidered in the light of earlier recommendations, and a final decision on acceptance or rejection was made.

We have organized the 13 accepted papers in the current issue according to three themes. Firstly, papers that attempt to ground the phenomena of presence within a theoretical context. Secondly, those that report experimental findings related to the psychological experience of presence. Thirdly, papers addressing "social presence", the experience of sharing the presence of others in a virtual experience.

In the first paper of the theoretical section, 'Presence and general principles of brain function' Daniel Sjölie provides a way of interpreting the phenomena of presence, from a new perspective based in the general principles of brain function.

Next, two of the special issue editors, Giuseppe Riva and Fabrizia Mantovani, present a rather different general framework for understanding presence in mediated interactions, travelling 'From the body to the tools and back'. They suggest that it is

possible to distinguish between two different types of mediated action: first-order (I use the body to control a proximal artifact) or second-order (I use the body to control a proximal artifact that controls a different distal one). These two mediated actions, when successfully mastered by the user, produce different experiences of presence.

In their paper 'Embodiment and Telepresence: Toward a Comprehensive Theoretical Framework', Antal Haans and Wijnand Ijsselsteijn also see mediated presence as a natural consequence of embodiment. They suggest that having a body brings entailments in terms of morphology, body schemata and body image which explain the practical phenomena of presence and have implications for the design of future interactive experiences.

In the last of our more theoretical papers, David Benyon, in 'Presence in Blended Spaces', addresses the importance of understanding presence in mixed realities. In both physical and digital space, the objects and agents inhabiting the space, and the way they behave and react towards the self, determine the nature of presence there. By considering the correspondences between the physical and the digital, more effective and satisfying 'blended spaces' can be designed.

Moving on from more general theoretical perspectives, papers in the second group focus more particularly on the effects of various experimental manipulations on the experience of presence. As the title suggests, the paper by Stephane Bouchard and his colleagues is concerned with 'Manipulating subjective realism and its impact on presence'. The authors present preliminary results on feasibility and neuroanatomical correlates, working from a clinical perspective.

In 'Interacting with the Music Paint Machine: relating the constructs of flow experience and presence', Luc Nijs and coauthors report an experiment to investigate presence in terms of the related concept of 'flow'. They suggest, *inter alia*, that presence ratings in positive experiences have a predictive value for understanding flow.

In the next paper, 'The effects of Egocentric and Allocentric Representations on Presence and Perceived realism : Tested in Stereoscopic 3D Games', Jinwoo Kim et al. report the interesting finding that egocentric representation (first-person perspective) affects sense of presence both directly and indirectly through perceived realism, whereas allocentric representation (independent of the perceiver) contribute a sense of presence only indirectly through perceived realism.

Daniela Villani and her coworkers ask: 'May I experience more presence in doing the same thing in virtual reality than in reality?' The answer comparing a simulated job interview in a real and virtual world is 'yes'. Specifically, self-report data suggest that experienced presence was higher during the virtual interview than in the real world simulation. This interpretation was confirmed by subjective (higher in VR) but not by objective (HR/GSR) anxiety scores.

The paper by Evangelos Karapanos et al., 'Does locality make a difference? Assessing the effectiveness of location-aware narratives' is concerned with the increasingly important topic of experienced presence in mixed realities, realities consisting of both physical space and digital elements which are sensitive to geographical location (see also the paper by Benyon on 'Blended Spaces' in this issue).

The relation between social and individual presence is an interesting and controversial one. Social interaction often seems to enhance presence, as the shared experience strengthens its salience and subjective realism. But individual presence and social presence may also present themselves as opposing forces in some situations.

In the first paper specifically addressing social presence, 'Age differences in the perception of social presence in the use of 3D virtual world for social interaction', Panote Siriaraya and Chee Siang Ang examine shared presence as a function of location. In the experimental situations used, the same narrative is presented in locations with varying degrees of relatedness to the story. Surprisingly, they found that while immersiveness and mental imagery were affected by the experimental manipulations, presence, memorability and emotional involvement were not.

In 'Video-mediated and Collocated Gameplay: Effects of Mutual Gaze on Game Experience, Expressiveness and Perceived Social Presence', Suleman Shahid, Emiel Krahmer and Marc Swerts investigated how pairs of children interact socially and express their emotions while playing games in different communicative settings. Their results stress the importance of designing for mutual gaze in video communication environments, especially for play and for children.

Guillaume Chanel, Matias Kivikangas and Niklas Ravaja, in their paper 'Physiological compliance for social gaming analysis: cooperative versus competitive play', confirmed previous findings that there is a higher correlation between two interacting game players in a conflicting situation than in a cooperative situation. The results also showed that physiological compliance is related to self-reported social presence.

'Let's do the Time Warp again - Subjective and Behavioral Presence Measurement and Interactivity in the Collaborative Augmented Reality Game TimeWarp', by Astrid Marieke von der Pütten et al., reports the surprising finding that pointing behaviour and verbal responses to virtual content within an augmented reality scene were negatively correlated with the sense of presence. On the other hand, the interaction possibilities perceived by the participants predicted their experience of social presence with the virtual characters in the game.

All in all, we have a fascinating and varied collection of papers and we thank all our contributors and reviewers for their efforts. As guest editors, we are very pleased to welcome you to this Special Issue of Interacting with Computers on the topic of Presence and Interaction.

John Waterworth[1], Eva Lindh Waterworth[1], Fabrizia Mantovani[2] & Giuseppe Riva[3-4]

List of Reviewers
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