

Aspects of the Self in VR: Implications for Design

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Abstract

The self in virtual reality (VR) is emerging as a cross-disciplinary topic that has important implications for VR design: the self is critical in creating the impression of *being there*, or *presence*. The primary location of the conscious self is typically derived from information about one's body and one's actions. However, VR technology enables virtual presence elsewhere, creating multiple simultaneous locations of the self. The goal of the proposed workshop is to explore how the self functions when it is virtually displaced and how these different locations/ aspects of the self function together to create the defining feature of VR – presence. The major emphasize in addressing these issues will be on the implications that the displacement of the self has for VR design.

Keywords: virtual reality; the self; self-agency; self-ownership; body awareness; motor control; forward model.

Introduction

VR technologies have yet to provide rich somatosensory feedback to action in order to prevent situations where what the body senses does not coincide with what the mind experiences. The mismatch between bodily senses and mind's experience of an action creates a unique opportunity to study aspects of the minimal self: self-agency, i.e. the sense that I am *causing* the action, and self-ownership, i.e. the sense that I am *experiencing* the action (Gallagher, 2000). According to the forward model of motor control (Frith et al., 2000), our actions are associated with anticipated sensory feedback. When predicted feedback does not coincide with the received feedback, both sense of agency and sense of ownership may be affected. As an example, in a recent experiment a mismatch between expected and received bodily feedback was sufficient to mislocalize the self and associate it with a virtual body (Lenggenhager et al., 2007). Similarly, designers are aware that a lag between for example a hand movement or head motion and the received bodily feedback in VR may negatively affect user's sense of presence (Leeb et al., 2007). Thus, better understanding of how and why that happens may be the key to improving presence.

Workshop Aims and Goals

The current workshop aims to gather researchers who are working on issues related to the self and designers who are interested in potentially improving presence in VR via better understanding of the mechanisms of the self. It intends to open a discussion on how the most recent theoretical

approaches and empirical findings pertaining to the self may help with practical design challenges related to improving our sense of self in VR. Thus, the main goal of the proposed workshop is to bridge a gap between a relatively rich research on the self in disciplines such as philosophy of mind, cognitive neuroscience, psychiatry, social psychology, on one side, and VR design, on the other. Bridging the gap is important for two reasons: (i) better understanding of how the self functions in VR will help to improve VR design; (ii) at the same time, VR represents an excellent testing ground for theories on the self.

In addition to providing an opportunity to researchers and designers to present their general positions and exchange more specific ideas on the self in VR, the workshop aims to assess and evaluate the need for establishing a more regular venue for VR designers to obtain feedback from the researchers involved not only with theoretical and empirical aspects of the self, but also with cognitive functioning in VR in general.

Workshop Format

General Set-Up

This full-day workshop consists of three sessions, each of which begins with a 30 minutes invited talk. In addition, the sessions contain 20 minutes talks, and 5 minutes reports/ demonstrations, followed by a panel discussion at the end of the last session. Here is a brief description of the sessions and confirmed invited speakers:

Session 1: *The Minimal Self in VR* will be introduced by Shaun Gallagher, from the University of Central Florida, Orlando, FL, USA, who will give a talk titled *Agency and body ownership in virtual reality*.

Session 2: *Displaced Self and Navigation by Thought*. This session will be introduced by a talk on navigation by thought in VR by Dr. Robert Leeb, from the Gratz University of Technology, Gratz, Austria.

Session 3: *Presence and the Sense of Self: Some Open Issues in VR Design*. This session will be introduced by Dr. Jörg Schulte-Pelkum, Max-Plank Institute for Biological Cybernetics, Tübingen, Germany. His talk will be on the relation between perceived illusory self-motion and presence in VR.

Intended Audience

The workshop is open to researchers working on aspects of the self in any field as well as to VR designers who are interested in communicating their experiences with the role of the self in achieving presence in VR.

Publication

The Proceedings of the workshop will be published by an internationally recognized publisher. At this time we have an expression of interest from Springer.

References

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