

re(PER)curso: an interactive mixed reality chronicle

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1 Introduction

re(PER)curso presents an interactive mixed reality narrative where two human performers – a percussionist and a dancer - and a number of real-time synthetic actors including sonification, virtual cameras and an anthropomorphic avatar, explore the confluence of the physical and the virtual dimensions underlying existence and experience (Figure 1). The synthetic components of re(PER)curso are realized with computer generated graphics, automated moving light and stage control, video art, a synthetic music composition system called RoBoser [Manzolli and Verschure 2005], and an avatar embedded in a 3D graphic environment. The integration of all elements is realized through the multi-modal mixed reality system the eXperience Induction Machine (XIM) that is based on an earlier large scale public exhibition called Ada [Eng 2003]. XIM is controlled through a neuromorphic system that defines all the rules of interaction and performance dynamics and as a result the complete performance is synthesized in real-time and evolves without human intervention beyond that of the two human actors on the stage.

re(PER)curso is an experiment in interactive narrative and explores the potential of virtual reality and augmented feedback technologies as tools for artistic expression. It expresses a general research strategy where the limits of advanced technologies are explored through their application in art. re(PER)curso is operated as an autonomous interactive installation that is augmented by 2 human performers. It is supported by a number of input devices that track and analyze the ongoing performance through cameras and microphones; controllers such as the synthetic composition engine RoBoser and output systems that include the large-scale real-time computer graphics, moving virtual and real cameras, and moving lights. Stage information obtained by the tracking systems is also projected onto the virtual world where it modulates the avatar's behavior allowing it to adjust body position, posture and gaze to the physical world and to adjust properties of the virtual cameras.

2 Performance

re(PER)curso is performed in an augmented mixed reality environment, where the physical and the virtual are not overlapping, instead they are distinct and continuous. The border between the two environments is the projection screen that acts like a dynamic all seeing bi-directional eye (Figure 1).



Figure 1: in *re(PER)curso* the physical space and the virtual space are continuous and tightly coupled supporting real-time interaction.

The narrative concept of *re(PER)curso* is captured in its name: Percurso: pathway, course; Recurso: source, point of view, *re-PER-curso*: re-assigned course. The chronicle of *re(PER)curso* evolves around four performative elements: *Sopros* (wind), *Pedras* (stones), *Folha* (leaves), *Peles* (skin) that are metaphors for our memory of the past, our interpreted present, anticipated future and their confluence. Throughout the performance, these elements are interpreted and re-interpreted by the percussionist, the dancer, RoBoser and the avatar.

The live performances of *re(PER)curso* at the museum for contemporary art (MACBA) in Barcelona (June, 2007) and during the ArtFutura festival (Barcelona, October, 2007) have shown that interactive autonomous mixed reality performances are a viable technological and artistic paradigm.

1. MANZOLLI, J and VERSCHURE P. 2005. Roboser: a Real-World Composition System. *Computer Music Journal*. 29: 55-74.
2. ENG, K., et al. 2003. Ada: An artificial creature for the Swiss Expo.02. *IEEE International Conference on Robotics and Automation (ICRA 2003)*, pp. 4154-4159 Taipei, Taiwan

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