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Interactive Story Telling in Mixed Reality Environments: An experimental approach

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Abstract

Virtual and mixed reality environments need to express a narrative in order to engage the human observer and participant. Ideally, the narrative content must change the motivational, emotional and/or cognitive state of the observer and the identification (or engagement) between the user and the narrative space must be well defined in order to facilitate comprehension and interaction.

In order to achieve effective Mixed Reality Narrative (MRN), it is necessary to look for strategies that meet the essential features of different forms of story telling. MRN is fundamentally different from standard forms of narrative such as novels or cinema, e.g. the story is localized with respect to the user, is modified by the user and takes place in real-time. In addition, we must consider an alternative notion of subjectivity since all actions are defined in the frame of reference of the user(s). Moreover, the user must be able to interact with the installation itself as a natural action that has an ecological validity and, at the same time, he/she must be able to perceive, comprehend and inspect every articulation of the narration to appreciate the experience.

We have explored MRN using three different paradigms for story telling implemented in three different mixed reality environments: 1) a large-scale interactive exhibit called Ada that exposed its 560K visitors to an artificial creature with its own goals, actions and emotional states that was embedded in the physical structure of the exhibition building [1]. 2) XIM, the eXperience Induction Machine, a mixed reality environment that goes beyond its predecessor ADA by also providing a gateway into a virtual environment or the Persistent Virtual Community (PVC). 3) a mixed reality performance called re(PER)curso where two human performers (a percussionist and a dancer), interact in real time with computer generated music, environments and animated characters.

Whereas Ada had a focal narrative that was given coherence through the notion of Ada as an ambient sentient being that could be encountered and explored, XIM has an interactive emergent narrative that arises from the interaction of physically present humans, remotely present humans, fully synthetic characters and an ambient intelligence in mixed reality. The interactive narrative in XIM takes the form of an auto-demo that is at the same time informative and has a high emotional impact on the user in a very short period of time. The narrative structure of the XIM self-demo is based on the Aristotelian Arch Model: exposition, rising to climax and denouement which are translated into five stages: Entrance, Inside Story, Outside Story, Experience and Finale. In Ada and XIM the narrative is explored through active user participation with re(PER)curso, however, we developed an interactive narrative mixed reality that focuses on the assigning of meaning and experience from multiple perspectives by a passive observing audience. The performance is organized in four main scenes: Prologue, Elements, Dance and Epilogue. Each scene is supported by a number of input devices in particular the visual active tracking of the ongoing performance, a number of drum carpets that are interfaced to midi devices, microphones, vision, drum carpets, and controllers such as the synthetic composition engine RoBoser [2] for interactive real-time sonification, and an accurate and robust tracking system for a reliable tracking of the dancer movements. The character of the avatar and its environment is the key interpreter, mediator and/or initiator of the performance.

Our preliminary data emphasize that the behavior of human observers and actors show differences under these three conditions. The analysis of these different behaviors is as a first step towards a taxonomy for MRN that will generate an enhanced immersion and believable experience as compared to existing systems.

The three installations used here are unique and we are not aware of any similar comparisons in the literature.

These results contribute to our understanding of MRN with respect to the human observer and are a stepping-stone towards fully synthetic MRN systems.

References

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