Immersive and Interactive Game Technology as an Experimental Test Bed for HRI

Tom Adamson and Lundy Lewis

Department of Game Design and Development
Southern New Hampshire University
Manchester, NH USA
t.adamson@snhu.edu, l.lewis@snhu.edu

Abstract

Studies of the implications of HRI will involve immersion and interaction with robots; however, many such studies are limited because current day robots aren't sufficiently mature technically to carry out meaningful HRI experiments. We propose that immersive and interactive game technologies provide a reasonable test bed for such experiments in the short term and might provide insights for the implications of full-fledged HRI in the future. To explore this claim, we'll set up a Wii System to demonstrate immersion and interaction with virtual robots. As a group, we'll discuss whether and how the Wii System could be used as an experimental test bed for studying the implications of HRI. The talk we be more of an experiment among workshop participants rather than a public address.

Introduction

Immersion is the act of participating physically and sentiently in an environment populated by a multiplicity of entities. For example, humans are bound by immersion. Some of the attractions at Disney World and Universal Studios approximate immersion by equipping rides with sound, motion, smell, and 3-D vision. Game technologies such as the Wii System now include immersion where sensors are attached to the player's appendages such that the system includes the player's movements in the game play. Recently, the Wii System has shown to be effective for serious purposes such as physical therapy and rehabilitation, e.g. loosening up shoulder muscles after a shoulder dislocation.

A property of human-robot interaction will be immersion and interaction. However, a drawback of HRI experiments is that robots aren't yet sufficiently mature enough for public accessibility. They are too expensive, too unwieldy, or technologically immature for such experiments, although we expect this situation to reverse 20 years or so in the future.

We propose that immersive and interactive game technology is a good vehicle for performing HRI experiments until such time as robots are publicly accessible. In fact, it may well turn out that immersive game technology will inform us positively towards the social, ethical, and religious implications of future HRI.

This talk will be a show-and-discuss sort of talk. The talk will include demonstrations of the Wii System and explanations of the technology. These will be live Wii demonstrations as opposed to video demonstrations. Workshop participants will be able to discuss first-hand the possibilities and limitations of using immersive game technology for HRI experiments.

The following references include recent articles in the popular press on immersive game technology for rehabilitation and other purposes. For further discussion, see "Immersive Digital Environment" and "Immersive Virtual Reality" at www.wikipedia.com and the references therein.

References

Head Tracking for Desktop VR Displays using the WiiRemote. Johnny Chung Lee, Human-Computer Interaction Institue, Carnegie Mellon University www.youtube.com/watch?v=Jd3-eiid-Uw

Wii speeds up the rehab process. USA Today, 7/24/07 http://www.usatoday.com/tech/gaming/2007-07-24-wii-therapy_N.htm

Hospital starts using Wii for rehabilitation. Geeksugar on-line mag, 5/18/2007 http://www.geeksugar.com/260712

Nintendo's Wii finds use in physical therapy. Minnesota Daily, 9/12/2007 http://www.mndaily.com/articles/2007/10/12/72163822