

## Augmenting Creative Realities: the *Second Life Performance Project*

Kathryn Farley, Michael Nitsche, Jay Bolter and Blair MacIntyre, School of Literature, Communication and Culture, Georgia Institute of Technology, 686 Cherry Street, Atlanta, GA 30332-0165  
E-mail:  
<kfarley6@mail.gatech.edu>, <michael.nitsche@lcc.gatech.edu>, <jay.bolter@lcc.gatech.edu>, <blair@cc.gatech.edu>.

### Abstract

This article discusses the development of a new interface that allows for the creation of mixed reality performances. It details the features of the new technology, charts the ways in which the interface has been used in rehearsal sessions and describes how the technology function as an innovative tool for creative expression. Key words: mixed reality, performance, MMO, Augmented Reality, *Second Life*.

Massive multi-user online (MMO) worlds, such as *Second Life*, have the potential to act as facilitators of cross-media and cross-cultural exchange, providing locations for newly forming communities. These communities often grow from a wide range of new possibilities beyond the conditions of the physical world. Questions of gender representation, race, social status, and political organization are mirrored but often unfold in new ways in virtual environments. We applaud these new features but are concerned that a complete

reliance on the new digitally-infused forms of expression might become so self-sufficient that it detaches from the more “physical” history we are surrounded by in the real world.

In addition, the potential of online worlds for performance and artistic expression remains problematic because the digital platforms are still limited. *Second Life* only serves as the most prominent and active platform that illustrates these limitations. Players are confined to existing animation systems, render pipelines, and interfaces [1]. As a result, expression is limited and “real world” topics or practices are often abstracted into the purely digital. It is our intention to focus on the friction between the purely digital and the purely “real” to investigate new forms of performances. This paper describes a new interface between digital MMO worlds and physical spaces that supports mixed media performances.

We have developed an Augmented Reality (AR) interface into *Second Life* that allows us to combine real actors and virtual ones (avatars) on a shared visual plane. With this setup, we blend the world of *Second Life* with real world artistic practices and their expressive range. Thanks to this interface we can address the friction zone between the ephemeral virtual realms and the “real” physical human body, its history, limitation and power. Our project involves the cooperation of performance artists, such as Georgia Tech's resident improv troupe, *Let's Try That!* who help us explore the range of expression such a cross-media platform allows. Based on the feedback we receive from these performers, we are constantly re-iterating

our interface and developing the project further.

Our work is influenced by new advances in video game technology. Largely driven by the community of game players, video games have seen a shift towards games as a platform for self-expression. Players, in these cases, do not play the game to achieve a certain high score but to make an artistic statement and express opinions. This form of emergent play illustrates the complexities of video game textuality. The text in a video game – as in a theater piece – needs to be performed to come into existence [2]. Theorist Espen Aarseth traces this performance back to the ‘ergodic,’ muscular activity of the player during the interaction process [3]. Players are always performers. The question is: how much can they affect the arsenal of expressions for the performance?

The mechanisms of *Second Life* puts it in-between the restricted access of a game world and the freer concept of a game modification. *Second Life* actively encourages expression through its own creative construction, as users – “inhabitants” – of *Second Life* can add their own virtual creations to the existing world. For example, users can model their own 3D objects, modify the space, add their own textures, re-shape and animate their avatar. However, a lot of underlying restrictions still apply. The animation control and render system is fixed, as well as the number of polygons used in a certain location. The use of dynamic lights and detailed avatar appearances is usually very limited as both put heavy pressure on the render engine. Ultimately, *Second Life* offers an exciting digital performance venue but

presents new restrictions of expression at the same time.

Instead of relying solely on in-game adjustments, we modified the *Second Life* client program in the Augmented Environments Laboratory under the supervision of Blair MacIntyre. Thanks to these changes we can combine AR interfaces with the *Second Life* platform. The system virtually conflates two spaces: the real and the virtual stage. Avatars active on the virtual stage in *Second Life* are combined with the real world actors in the physical performance space. Certain objects can be present in both worlds and allow overlap of action that supports a more effective blending of the two worlds. For example, we usually have some virtual invisible chairs in the *Second Life* space positioned at the same location that the camera sees real chairs in the physical space. Thus, in the combined image a virtual avatar seems to sit on a real chair. The mirroring of other objects and entities is used to provide for occlusion.

In practice, the performing player can use the prototype in two ways: either through a Head-Mounted Display (HMD) or using fixed cameras. When the HMD is used, the system allows for precise 6 degree-of-freedom (DOF) tracking within the lab setup of the HMD tracker. This setup depends on the range and functionality of the tracking devices. In case of the fixed camera, the player is less confined to the cumbersome helmet interface and the system can be installed in different locations relatively easily. However, the camera is restricted to one perspective and the actor feels like playing against a fake mirror (a large LCD screen) on which the composite image is projected. In both cases, tracking proved

to be very precise and robust. We also record from the real stage and broadcast it into the *Second Life* stage and vice versa to allow for direct audio conversations. Finally, we stream the composited video image back into the *Second Life* environment and project it as live broadcast on virtual cinema screens.

We have run weekly rehearsals as well as special performances with the new technology during the 2007-2008 academic year. Instead of relying on a fixed performance text, we have opted to experiment with improvisation games and exercises that allow the live actors to interact with virtual characters in dynamic ways, such as the creation of scenes using improvised dialogue and movement. We have found that the hybrid performance space acted as a malleable environment in which people from various perspectives and levels of experience can come together to experiment with new options for creative expression. The visiting performance artists (directors, art directors, actors) all agreed in the value of such a new form. We will continue to use the technology to establish a workshop-like environment for the production of short video pieces, live performances, and mixed media presentations and lectures.

There are a number of technical challenges that remain inherent in the system. For example, audio transmissions have a short delay, which seemed manageable for our actors; video transmissions into *Second Life* have a larger delay (more than 6 seconds) as they depend on the video server used (*Quicktime* streaming video). However, the setup has proven to be stable in numerous conditions as well as

affordable. Especially the single camera version does not depend on any expensive hardware or software. Once installed, it remains mobile and relatively easy to set up. The biggest challenge is the constant stream of updates for the *Second Life* client itself. In order to follow the development of this client (which happens at times on a weekly basis), we have to re-compile our modification whenever a new version is released.

The prototype is a first combination of a MMO world with a physical stage using consumer electronic AR. As such, it offers the necessary combination of the “real” with the virtual and opens up new friction zones for mixed media performances. The project is very much intended for ongoing experimentation. We are still expanding this usage further and hope to include pieces of puppetry or dance in future installations.

#### References and Notes

1. Michael Nitsche and Maureen Thomas, “Play It Again: Film Performance, Virtual Environments and Game Engines,” in Colin Beardon and Gavin Carver, eds., *New Visions in Performance: The Impact of Digital Technologies* (Lisse: Swets & Zeitlinger, 2004).
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