

AR Façade: An Augmented Reality Interactive Drama

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Abstract

Our demonstration presents *AR Façade*, a physically embodied version of the interactive drama *Façade*, at the Beall Center in Irvine, CA. In this drama, players are situated in a married couple's apartment, and interact primarily through conversation with the characters AR can create an increased sense of presence, confirming generally held expectations. However, we learned that increased presence does not necessarily lead to more engagement. Rather, mediation may be necessary for some players to fully engage with certain immersive media experiences.

1 Introduction

Games and narrative experiences that mix virtual content into physical environments have emerged in the research community in recent years (e.g., [Brown et al. 2003]), continuing a general trend of looking beyond standard desktop interaction. Research thrusts towards more immersive technologies such as Virtual Reality (VR) or Augmented Reality (AR) suggest a link between more embodied interfaces and increased feelings of both presence and engagement in the experience. The VR community has studied the concept of presence for years, seeking to understand how different immersion factors (e.g., rendering latency, animation quality, interaction techniques) affect a person's sense of being in a real space (e.g., [Sheridan 1992]). However, aside from largely quantitative studies of task performance [Swan et al. 2003], there has been relatively little work comparing the impact of different interfaces on user engagement. Without comparing similar, fully developed experiences across different media, it has been difficult to convincingly answer the research question: how does the feeling of presence created by immersive technology impact engagement with a game or narrative experience?

Our research explores the link between immersion, presence, and engagement using different interfaces to *Façade*, a conversation-centered interactive drama. *Façade* is the first fully produced, real-time, interactive drama, combining autonomous characters, artificial intelligence (AI)-based story management, and natural language processing to place the player in a dramatic world. Through conversation, movement and emotive gestures, the player



Figure 1: AR Façade, an augmented reality interactive drama

interacts with the characters Trip and Grace, and quickly finds herself entangled in the dynamics of their troubled marriage. For complete details of *Façade*, see Mateas and Stern [2003].

In this demonstration, we present two versions of *Façade*: original desktop 3D with keyboard input and fully immersive augmented reality (AR) where the player wears a precisely tracked, video-mixed see-through head-worn display in a physical recreation of the *Façade* apartment, allowing them to walk, gesture and speak to the virtual characters Trip and Grace (see Figure 1). The installation is part of a three-month exhibit at the Beall Center, a center for art and technology at the University of California Irvine. Visitors will be able to participate in both versions of the *Façade* experience to contrast the different interfaces.

The most striking result of our earlier study suggests (contrary to our initial expectations) that while the more immersive AR interface increased most players' sense of presence over desktop interaction, heightened presence did not always lead to increased engagement. This is not an indication of a flaw in our AR implementation, or a sign that presence is generally bad. Rather, while AR heightened a player's sense of connection with their character, the other characters and the space, the immediacy of the interface appears to have interfered with several players' ability to experience the game as a "play space" [Salen and Zimmerman 2003]. These players preferred desktop interaction specifically because it is less immersive, making it easier to take on different personas and providing a safe distance from the emotionally charged drama.

2 Façade Setup

The interactive drama *Façade* is a hybrid entertainment form, somewhere between a game and storytelling. In this section we describe *Façade*'s story and the two variations on display for this demonstration (desktop *Façade* is also available for download at www.interactivestory.net).

2.1 Façade's Story

As a friend invited over for drinks at a make-or-break moment in the collapsing marriage of the protagonists Grace and Trip, the

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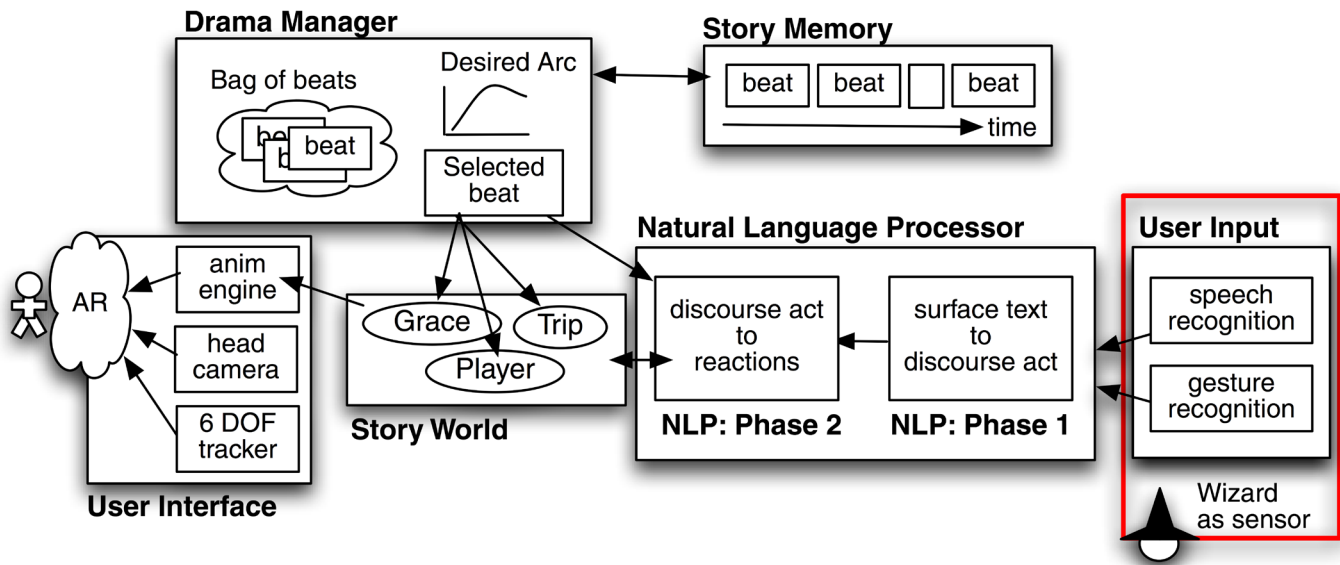


Figure 2: Technical Setup for AR Façade. We use the “Wizard of Oz” method for speech and gesture recognition (right)

player unwittingly becomes an antagonist of sorts, forced by Grace and Trip into playing psychological “head games” with them. The player, choosing her own name and gender, may react to the experience with hilarity or anger, or play a number of roles from councilor to devil’s advocate. Unlike most games, the players are not given a clear goal; the player invents goals for herself as the interaction with the characters unfolds.

In the intro sequence, the player hears a voice mail recording from Trip, inviting the player over for a visit. The game begins with the player in the hallway outside the apartment, where the couple can be overheard arguing. Upon entering the apartment, the player realizes that something is wrong. The façade of their luxury apartment and fancy drinks barely conceals the awkwardness between Trip and Grace. Soon the player finds herself in the midst of a full-blown marital breakdown where her actions and statements affect the outcome of the evening.

Three interacting AI systems guide the experience (see Figure 2). The natural language processing system interprets natural language input and physical actions from the player, maintains conversational contexts, and selects conversational responses from thousands of prerecorded character lines of dialog. The autonomous character architecture manages the moment-by-moment goals of the characters, coordinates the joint performance of dramatic action, and drives the procedural character animation. The drama manager moves the story forward, through a growing crisis, climax and resolution, the three stages of a classic Aristotelean story arc. Designed to have replay value, each episode differs as the experience adapts to the moment-to-moment interaction of the player.

2.2 Variations of Façade

We initiated this project because we hypothesized that an AR version would allow us to investigate the impact of immersion (and hopefully presence) on a rich narrative experience. Moreover, since Façade is based primarily on social rather than physical interaction, it placed less emphasis on having perfect object tracking and complex gesture recognition than other potential AR experiences.

In our earlier study we gathered qualitative data about player experience, exposing participants to three different variations of Façade to facilitate a subjective contrast. We created the speech-based version of desktop Façade to tease out any confounds between speech interaction and embodiment (e.g. walking/gesturing). In the

traditional version of Façade (keyboard-based desktop interaction, or KB), the player sits at a desktop machine, using the keyboard to type statements and navigate the space and the mouse to perform gestures, such as hugging the characters or picking up objects around the apartment. In speech-based desktop interaction (SB) the player uses the same interface to navigate and gesture, but rather than type, she uses speech to communicate. In augmented reality interaction (AR) the player also uses speech to communicate, but navigation occurs in an actual physical apartment built to match the virtual desktop apartment. In AR, the entire world is physical except for Trip and Grace, who are aligned with the physical space and superimposed on the world using a video-see-through head-mounted display (HMD) worn by the player (see Figure 1).

We utilize a “Wizard of Oz” to facilitate speech recognition in AR interaction (Figure 2, right). The wizard operator types in the player statements on a remote machine; emulating speech recognition, the words then appear one by one at the bottom of the player’s screen. This provides the player visual feedback that their statements are being recognized. Similarly, in the AR version, the same wizard operator has a set of buttons to trigger a limited set of gestures to match the desktop versions. For complete details and discussion of the AR Façade implementation, see Dow et al. [2007].

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