

# How Does Reality-Based Interaction Affect Users?

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## 1. ABSTRACT

The concept of reality-based interaction has provided the research community an “hook” for discussing the future of human-computer interfaces. In this position paper, I call for extending the discussion beyond issues of task performance, to other aspects of the human experience. I share high-level findings from my empirical studies of *AR Façade*, an immersive and interactive drama, and discuss how bringing reality back can effect emotions.

## 2. Keywords

Augmented reality, emotion, affect, immersive and interactive drama, reality-based interaction, empirical studies

## 3. Reality-Based Emotion

The concept of reality-based interaction (RBI) has framed an interesting debate about the future of human-computer interfaces. Some would argue that the HCI community should design the interface even more “like reality,” taking advantage of technological advancements in sensors and multi-modal displays. Others have started to push back on the notion that people want reality. Jacob et al., for example, have argued that there are certain advantages of extending reality to give the user more expressive power or to perform tasks more rapidly [2].

We can move this debate forward by gathering empirical data that evaluates the underlying question. Rather than asking the technology-focused question, “how can we construct the technology more like reality?”—I believe we need to take a step back and ask: “how does reality-based interaction affect users?” In this essay, I give a brief overview of my work on the emotional effect of immersive interfaces and call for additional empirical work on RBI.

The notion of reality-based interaction is perhaps most pronounced in the efforts by virtual reality (VR) researchers. Some proponents of VR explicitly strive to engineer immersion factors (e.g. 3D sound, haptics, high-definition visuals, etc.) into the interface until the users are unable to distinguish the simulated world from real-world interaction [3]. The goal of many VR researchers is to induce a psychological state called “presence.” With healthy skepticism towards the goal of presence, my thesis work at Georgia Tech sought to answer the question: how do immersive interfaces make people feel?

My collaborators and I created an immersive experience that would allow us to draw direct comparisons between desktop interaction and the more “realistic” interaction paradigm. The central tool for our research was the interactive drama *Façade*, a novel game experience where the player interacts with two autonomous characters in the familiar scenario of visiting old friends [4]. We converted the original desktop-based game into

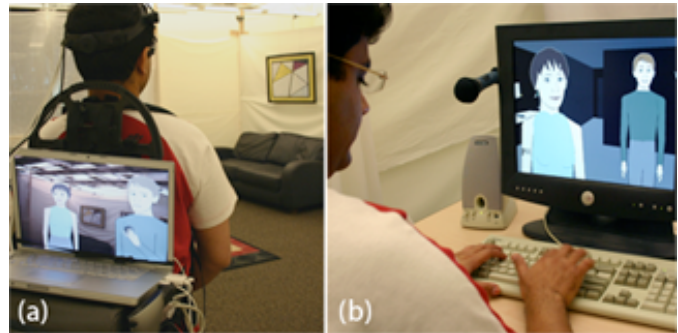


Figure 1: (a) Augmented Reality Façade; (b) desktop-based Façade

an “augmented reality” version where players use speech and gesture interaction in a life-size physical apartment built to match the virtual apartment (see Figure 1). In a series of experiments across multiple settings, we compared the player experience of WIMP interaction versus AR and analyzed player behavior and interview data from forty-five players [1].

My analysis of *Façade* revealed why the goal of VR should be more nuanced. VR researchers should not merely focus on presence, but consider the user’s sense of engagement, which can also account for a user’s sense of agency and their interest or involvement in the content. Specifically, my research demonstrated that immersive interaction can induce a sense of presence, but it also carries many of the expectations and risks associated with everyday “real-world” interaction.

First, “reality” may not provide the optimal mechanism for facilitating human-computer interactions. In AR *Façade*, players had no problem “using” speech and gesture, but they had trouble reading the effect of their actions on the simulation. This problem can be framed in Norman’s foundational language of direct manipulation in HCI [5]: VR often effectively closes the gulf of execution without closing the gulf of evaluation. The freedom afforded by natural speech and gesture was not met by perfect simulation, and thus expectations exceeded performance.

Second, the intensity of really being immersed and part of a scene can negatively impact a user’s emotional experience of a story. In AR *Façade*, many players indicated a desire for emotional distance from the simulation and stated a preference for desktop interaction precisely because it provided a psychological barrier. In the context of entertainment, the less the interface emulated reality, the more players felt free to “good off” and to “decide how they wanted to feel” rather than constantly feeling “on the spot.” Sometimes people simply want to remove the risks of reality and enjoy the comfort of having distance from story drama.

In conclusion, reality-like immersive interfaces attempt to take advantage of our familiarity and intuition about the real world.

However, immersive interfaces, like many techno-centric notions of RBI, can have unexpected effects on users by overly raising expectations for interaction and introducing an element of risk. We need more design and experimentation, not only to understand the drastic differences between RBI and WIMP interaction, but to tease out the most powerful metaphors that extend, distort, and constrain what we do in the real world. We need clever design that “plays off” or abstracts reality (more effectively than 3D document management [6]). We also need a human-centered research agenda that seeks to not merely recreate what we experience in daily life, but to enhance and extend it and to understand how these reality-based interactions affect users.

#### **4. ACKNOWLEDGMENTS**

I want to extend my appreciation to my closest collaborators Blair MacIntyre, Michael Mateas, and Manish Metha.

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