The Funki Buniz Playground: Facilitating Multi-Cultural Affective Collaborative Play.

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ABSTRACT

The Funki Buniz Playground is an environment where children can interact with each other simultaneously in both a virtual world -- through their avatars -- and the real world, which we built to study cross cultural affective responses and multi-cultural empathy. This paper describes some of the interaction design challenges we encountered while implementing the Funki Buniz Playground, as well as the constraints and solutions we discovered.

Keywords

Believability, avatars; autonomous characters; collaborative play; affective relationships; cross-cultural affective responses; multi-cultural empathy.

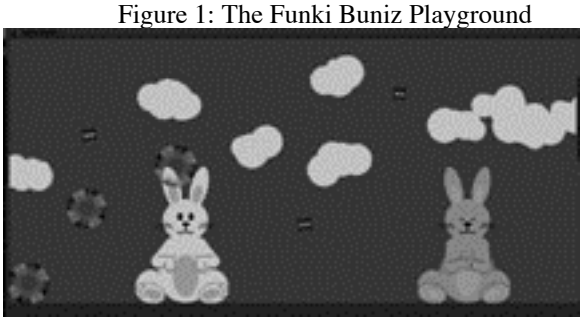
INTRODUCTION

Stacie: "Look at that cloud! It looks like a duck!"
Jimmy: "What cloud?"
S: "This one --" [walks closer to the mural and points at the screen.] "See? Here's the beak -- "
J: "I see it! You're right, it does look like a duck! Quack!"
[Stacie turns around and returns to her original position]
J: "Look! Didya see it? My Buni just did a really cool hop!"
S: "D'oh! I missed it!"
J: "He lifted one paw, and jumped on the other foot -- like this" [Jimmy jumps in demonstration]
S: "Cool! I betcha that mine can top that!"

Jimmy and Stacie are playing in the Funki Buniz Playground, where children can engage in collaborative play, interacting directly -- in the real world -- or through their respective on-screen avatars. Such interaction is facilitated by both the virtual environment, and the emotive improvisational characters (both user-controlled and autonomous ones) that inhabit it, as well as by the physical environment that the children share.

The Funki Buniz Playground emerged from our desire to combine the results of the extensive testing of "Tigrito: A High Affect Virtual Toy" [5] at CHI-Kids '98 with our desire to extend the system to allow several kids to successfully interact emotionally with each other, through their on-screen personas, and simultaneously, in the real world, independently of their cultural background and/or language limitations. Tigrito engages a child in an emotional rapport with improvisational virtual characters that s/he directs, at two distinct levels. At the high-level, the child alters the characters' moods by dragging the appropriate mood slider. At the lower level, the child chooses the actions the avatar should perform by clicking on the appropriate button. The design of the Funki Buniz Playground is the result of collaboration with the Information Mural's [6] interdisciplinary team at Stanford, and thus, combines the mural's display capabilities and multiple wireless input devices, with Tigrito's capabilities for affective interaction[4], based on the Virtual Theater's [1] framework for directed improvisation.

Figure 1: The Funki Buniz Playground



DIRECTION CONTROLS

We opted to avoid a realistic representation of the characters within the Playground. Instead, we designed a simple, cartoonish appearance for our characters' on-screen persona -- as if the children's own drawings were coming to life. Following the Information Mural's philosophy of exploring new interface modalities, we chose a rabbit for the lead role in our Playground, since its particular physiognomy offered a natural mapping with the traditional moods of the Virtual Theater's animated puppets: "[The] moods vary along three continuous dimensions: an emotional one ranging from happy to sad, a physiological dimension ranging from peppy to tired and a social dimension ranging from friendly to shy."[2] In our implementation we refer to these dimensions as Happiness, Friendliness and Energy, and represent them through the rabbit's mouth, ears and eyes respectively. For example, Friendliness is expressed by the degree to which the rabbit's long ears are open, and Energy through the degree to which its eyes are open. Moreover, to model emotions believably, we linked these previously orthogonal mood dimensions in the underlying emotional model, and

displayed them accordingly on his face. Thus, when the Buni (as our young users referred to the character) is angry, his ears will be folded, his mouth set in a frown, and additionally, his eyes will slant in a suggestion of frowning eyebrows. Following Chuck Jones' doctrine, "Believability. That's all we're striving for." [3], details, such as making Conejito's ears fold each at a different angle and rate were painstakingly designed. The believable social interaction between characters in the playground is modeled after the success of the Tigrito agents, with actions affecting the moods of the effector as well as the recipient, and energy decaying as the interaction progresses, among others.

The remaining direction control, action choosing, is similarly embedded; the top three most appropriate actions for a Buni to execute are presented as three floating iridescent bubbles, whose size reflects the appropriateness of the action contained. The bubbles reflect the constant dynamism of the character's moods, shrinking, growing or popping as the appropriateness of the action they changes. As soon as a bubble pops, a new bubble is generated off-screen and floats by, to hover either above, or to the side of the character. Despite our realistic and careful design of the bubbles' movement patterns, we were dismayed to discover that their constant motion, combined with the wireless' imprecision, made the bubbles quite hard to select. To compensate for this, we made the bubbles attract the mouse cursor, simulating a gravitational field. This attraction force lets the child select the desired bubble successfully, while simultaneously maintaining their suspension of disbelief.

THE ENVIRONMENT AS FACILITATOR:

The written button descriptions of Tigrito's interface provided a great incentive for the younger users of Tigrito, as the user testing revealed. However, these descriptors, along with Tigrito's large vocabulary of spoken expressions, encumbered the system's adaptation for multi-cultural exchanges. Since these exchanges constitute the basis of the Funki Buniz Playground, eliminating the linguistic content of the interactions proved key for the system's ability to explore cross-cultural affective responses, focusing the interaction exclusively on the developing affective relationships -- both in the virtual world, between the characters, and in the real-world, between the children. The consequences of this elimination, however, extended even to the virtual environment, stressing its role to be not only that of a key player in achieving and maintaining the child's suspension of disbelief and sense of engagement, but in addition, to that of a facilitator of the cultural exchange. Thus, the stage grew beyond the traditional black-curtained enclosure, into a grass-covered meadow, complete with blue skies, cotton clouds, and butterflies. As the implementation progressed, butterflies and clouds gained a life of their own, with the former drifting in and out of the children's field of vision at their own volition, and the latter's emulation of natural randomness in their formation pattern, let children 'recognize' shapes and animals in the water masses. Figure1 shows the general appearance of the Funki Buniz Playground, with the bubbles, butterflies, and clouds.

FUTURE DIRECTIONS

Before embarking on formal user testing, we are planning to enhance the Funki Buniz Playground in several directions. On the believability front, we are exploring the possibility of expanding the Buniz internal affection model to create a multi-dimensional emotive space where different characters would attribute distinct meanings to actions. Simultaneously, on the testbed front, we are designing new high-affect improvisational characters with distinct backgrounds and personalities, to demonstrate such an extension of the emotive space.

CONCLUSION

We hope to demonstrate through further user testing that the Funki Buniz Playground successfully facilitates and engages a multi-cultural group of children in open-ended collaborative play, thus increasing their understanding of – and ability to reconcile – cultural differences. Through the affective relationships children form while at the Playground, both between themselves and with their avatars, we hope to study cross cultural affective responses and multi-cultural empathy.

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