Interactive Storytelling System using Behavior-Based Non-Verbal Information: ZENetic Computer

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ABSTRACT

We have developed an interactive storytelling system that aims to help us "recreate" our conscious selves by calling on Buddhist principles, Asian philosophy, and traditional Japanese culture through the inspirational media of ink painting, kimono and haiku. "Recreating ourselves" means the process of making the consciousness of our 'daily self' meet that of our 'hidden self'. through stimulation of activity deep within us. Ultimately, this may meld our consciousness and unconsciousness in complete harmony. It is difficult to achieve this through traditional logic-based interactions. Our system is a new approach to reaching this goal by incorporating traditional media and methods in an interactive computer system.

Categories & Subject Descriptors: H.5.1

[Multimedia Information Systems**]: *Artificial, augmented, and virtual realities***

General Terms: Design, Experimentation, Human Factors

Keywords: Narrative technology, Editorial Engineering, Cognitive consciousness, expression technology

1. INTRODUCTION

We applied the several processes described below so that our system could give users the experience of "recreating our conscious selves." By completing each process, the user develops a connection between his or her hidden self, full of imagination and creative energy, and his or her daily conscious self, which directly interprets the ambient reality. This is achieved by stimulating the imagination through storytelling [1].

2. Philosophy of The Storytelling System

The user creates a virtual world by manipulating images of Asian *sansui* ink painting on a computer display with an intuitive and enjoyable interface tool. These images, which typically symbolize nature and philosophical precepts, provide a dramatic departure from our view of daily experience. This awakens us from our daily consciousness and gives free reign to subconscious imagination.

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Based on the user's sansui design, the system infers his or her internal consciousness and generates a story that the user can 'enter' via the computer display.

This story further shakes the user's consciousness. This is not a complete story, such as those in the movies or novels, but fragments of short stories. Experiencing these episodic stories makes users feel uneasy and arouses their subconscious desire to construct a whole story by linking the fragments.

In each of these inchoate stories, the system stimulates interaction through Zen dialogue or haiku as a form of allegorical communication. The user is asked questions that do not have "correct" answers. He or she is forced to deal with these ambiguous provocations while subconsciously struggling to answer the questions. This subconscious effort inspires the user to find ways of linking the stories into an original whole.

The user responds to objects presented by the interactive system, whether a graphic image or a provocative statement, by manipulating input means, such as a virtual calligraphy brush or rake of a Zen rock garden, on-screen images, or simply clapping hands. Coupled with the subconscious effort exerted to link the fragmentary stories, these user interactions decrease the gap between our daily self and our hidden self. This process of bringing our selves together is called *MA*-Interaction; *ma* is a Japanese concept that stresses the ephemeral quality of experience.

Finally, the user has a dialogue with a "bull," which has frequently been used as a metaphor of our hidden self in Zen Buddhism. Through this dialogue, users experience a virtual unification of their daily self and their unconscious self into a recreated conscious self.

3. TECHNICAL REALIZATION

3.1 Software Integration [2]

1) User make ink-painting picture by manipulating symbolic icons
2) User's hidden self is classified according to its *goun* by Neural Net.
3) User enter his or her picture and journey begins. Haiku is used to generate a fragmentary story that's illustrated in *3D Ink*-painting.
4) *MA*-Interaction is generated from the Zen Interaction along with chaos (then go back to Step 3 several times).
5) The Ten Bulls Story Interaction finally takes place (Zen method by Ten Pictures method).

3.2 Hardware Integration

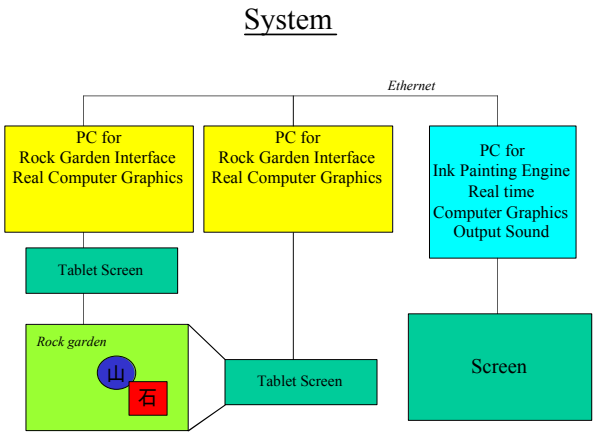

Figure 1. Zenetic Computer System

3.3 3D Sansui Ink-painting engine

First, the user interacts with a digital 3D ink paiting engine. Depending on how users draw their ink painting, the engine classifies their intrinsic persoanlity using a neural network. The personality corresponds to a point in a Goun space, where Goun is a categorization from Buddhism which says that five basic spirits and materials make up the world.

User data is also obtained at later times from various interactions between the user and the system, and used to determine a pseudo (manifest/dynamic/alternate) Goun personality. Depending on how the user is affected by the evolving story, the pseudo Goun personality may differ from the intrinsic (=hidden) personality. Conversely, the difference between the pseudo personality and the intrinsic personality will affect the evolving story via an engine, called a chaos engine.

3.4 Storytelling generated by chaos engine

The chaos engine [3] consists of three dynamic components, which we call agents. We name the three agents, User, Target and (Zen-)Master. The agents each have internal chaotic dynamics, and also move around in Goun space. The three agents are coupled so that there is an interplay between their motions in the Goun space and the synchronization of their internal dynamics. The transient dynamics of the chaos engine are sampled and used to create the sounds and images experienced by the user, and also to control the evolution of the story.

In the current implementation of the chaos engine for the Zenetic computer, the position of the User agent corresponds to the user's pseudo personality, and the position of the Target agent corresponds to the momentary view of the user's pseudo personality obtained from the latest user interaction. The User agent starts at the position of the intrinsic personality and tends to move toward the position of the Target agent. The User agent is coupled to the Target via the Master in such away that if there is no interference from the Master, the User tends to synchronize to the Target and move toward the Target position, so that the User and Target become identical. On the other hand, if there is interference from the Master, it is more difficult for the User to synchronize with the Target, and so less likely that the User will reach the Target. The strength of the Master's interference depends inversely on the distance between the pseudo personality and the hidden personality – the smaller the distance, the stronger the influence of the Master, and hence the more difficult it is for the User to synchronize and merge with the Target.

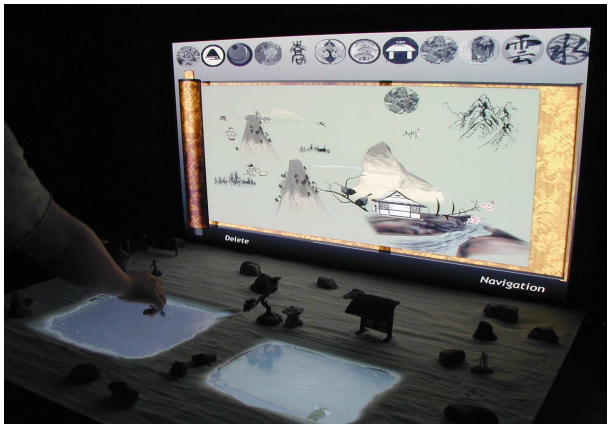

Figure 2. Storytelling Interaction by ZENetic Computer

4. CONCLUSIONS AND FUTURE WORK

Real-time interaction with individual consciousness and subconscious is a long-term challenge for computer systems. Interactive storytelling is a frontier which allows us to explore this challenge. Science says that human consciousness may have a chaotic nature. By incorporating chaotic mechanisms, our system aims to provide a rich and dynamic interaction which entangles the conscious and subconscious. Responses to questionnaires from users who have experienced the ZENetic Computer show that they tend to feel relaxed and stimulated in a way that they had never felt before. Both English and Japanese versions have been developed. This system will be exhibited at the MIT Museum and later at various locations throughput the world.

5. ACKNOWLEDGMENTS

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