

Intuitive Storytelling Interaction: ZENetic Computer

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Abstract: We tried to develop an interactive system that could 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 our selves" means the process of making the consciousness of our 'daily self' meet that of our 'hidden self' through rediscovering creative resources deep within us that may have been forgotten but still resonate with vital meaning. In other words, this interactive system is based on the effort to meld our consciousness and unconsciousness in complete harmony. It is difficult to achieve this through traditional logic-based interaction. We succeeded in reaching this goal by setting as our target of scientific computing images from the above traditional Japanese media[1][3].

Keywords: Storytelling, Interactive Art, Editorial Engineering

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[2].

2. Philosophy of the ZENetic Computer

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.

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 3D Sansui (ink-painting) Engine

We have developed an original 3D interactive ink-painting engine by utilizing the artistic perspective called *sanen*, where a single picture is composed in a way that allows it to be viewed from three viewpoints. This is the concept of perspective employed in traditional Japanese *sansui* (ink painting).

Depending on how users draw their ink painting, the engine classifies their hidden personality into one of five types by using a neural network and applying the Buddhist concept of *goun*, which says that five basic spirits and materials make up our world.



Figure1 3D Ink painting *Sansui* Engine

Accordingly, the system evaluates the drawing produced by the user and classifies him or her into one of the above five personality types. This *goun* data is what determines the “hidden personality” of the user which is an important factor in subsequent interaction. After this, users can enter into, their own 3D ink-painting picture through the presented display. Depending on the personality type of the user various stories are generated.

3.2 Storytelling network through MA-Interaction generated by an algorithm using Buddhism.

MA-Interaction is an interaction model that uses symbolism and allegory, and it derives from traditional approaches in Buddhism. The environmental information of a story, such as scenery or weather, is used for *godai*, which

encompasses all elements of structure: water, fire, wind, sky, and earth.

3.3 Generation of MA-Interaction by chaos engine

MA-Interaction involves three chaos agents Chaos1(ZEN Master), Chaos2(User Agent) and Chaos3(Target Agent).

Input: We provide four types of Zen Interaction. Each ZEN Interaction has a two-dimensional involvement model for analyzing a user’s interaction. These involvement models are briefly defined as follows

ZEN Interaction1: The density of the dots the user has drawn vs. the angles of curved lines the user has drawn with this model’s interface tool.

ZEN Interaction2: Which part of the animated catfish on this model’s interface the user picks up (head vs. stomach vs. tail)

ZEN Interaction3: Timing of the user’s hand clapping vs. the location on the display where the user starts to rake in this model’s animated Buddhist rock garden.

From these models, the resulting data go to the chaos engine.

The following describes the chaos engines[4][5] we employed to concretely generate this system’s unique *Ma*-Interaction. The algorithm proceeds by following certain steps at particular parameter points as described below.

First, depending on the user’s invisible personality data from the *goun* analysis, the system generates the first sentence of the story in a statement reflecting Zen communication. Then parameter point *St*(0), where animation appears on the display, is generated from the user’s immediate response—given by some input means like catching a catfish—to the story’s opening line.

The *St*(1) point (next target) is in turn determined by the user’s next interaction. So the user data can move from *St*(0) to *St*(1), the Chaos2 (User Agent) tries to synchronize with Chaos3(Target Agent) [9]. At the same time, Chaos1 (Zen Master) moves to interfere with this activity. The change (in *goun*) of the user data is seen as a change in animation.

If Chaos2 can synchronize with the user data, the user data succeeds in reaching the next target. However, if Chaos1 succeeds in thwarting the efforts of Chaos2 to synchronize with the user data, the user data is trapped at a “Compromise” point between Chaos2 and Chaos1.

As can be seen from the above, the process that eventually generates the personality-based unique

story is powered by both the movement toward targets prompted by user interaction and the chaos that is variously generated within all of the players' agents. In fact, it is the interplay between these two forces that characterizes this interaction system.

The interaction between the User Agent and the Target Agent is influenced by a "trigger" from the Master Agent. When the trigger from the Master Agent is strong, the synchronization between the User Agent and Target Agent is blocked and it becomes more difficult for the User to reach the Target.



Figure2 ZEN storytelling Interaction

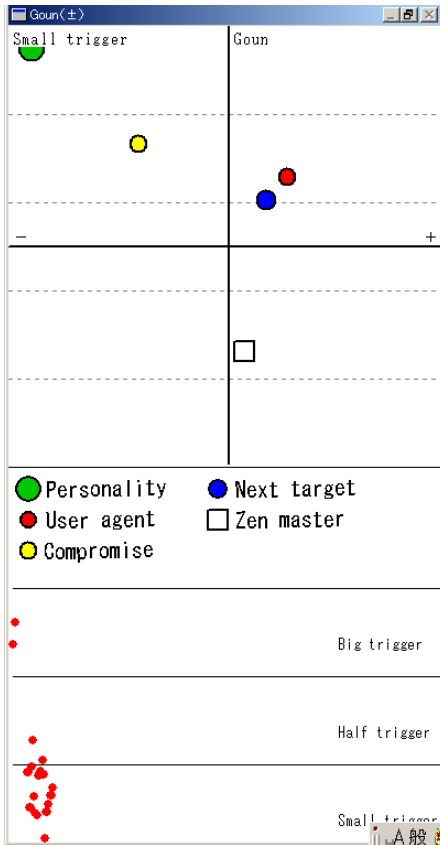


Figure3 Story generation and Trigger level by chaos engine

4. ACKNOWLEDGMENTS

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References

- [1] Seigo Matsuoka, "The Science of the beauties of nature," Shunjusha (1994)
- [2] Ryohei Nakatsu and Naoko Tosa, "Interactive Movies," Handbook of MULTIMEDIA COMPUTING, pp. 701-712, CRC Press (1999)
- [3] Naoko Tosa, Chapter 19: Expression of emotion, unconsciousness with art and technology, "AFFECTIVE MINDS," ELSEVIER, pp. 183-201 (2000)
- [4] Peter Davis, "Adaptive mode selection using on-off switching of chaos", International Journal of Bifurcation Chaos, 8 pp. 1671-1674 (1998)
- [5] Y. Liu, P. Davis, "Dual synchronization of chaos", Physical Review E, 61 pp. R2176-R2179(2000)

