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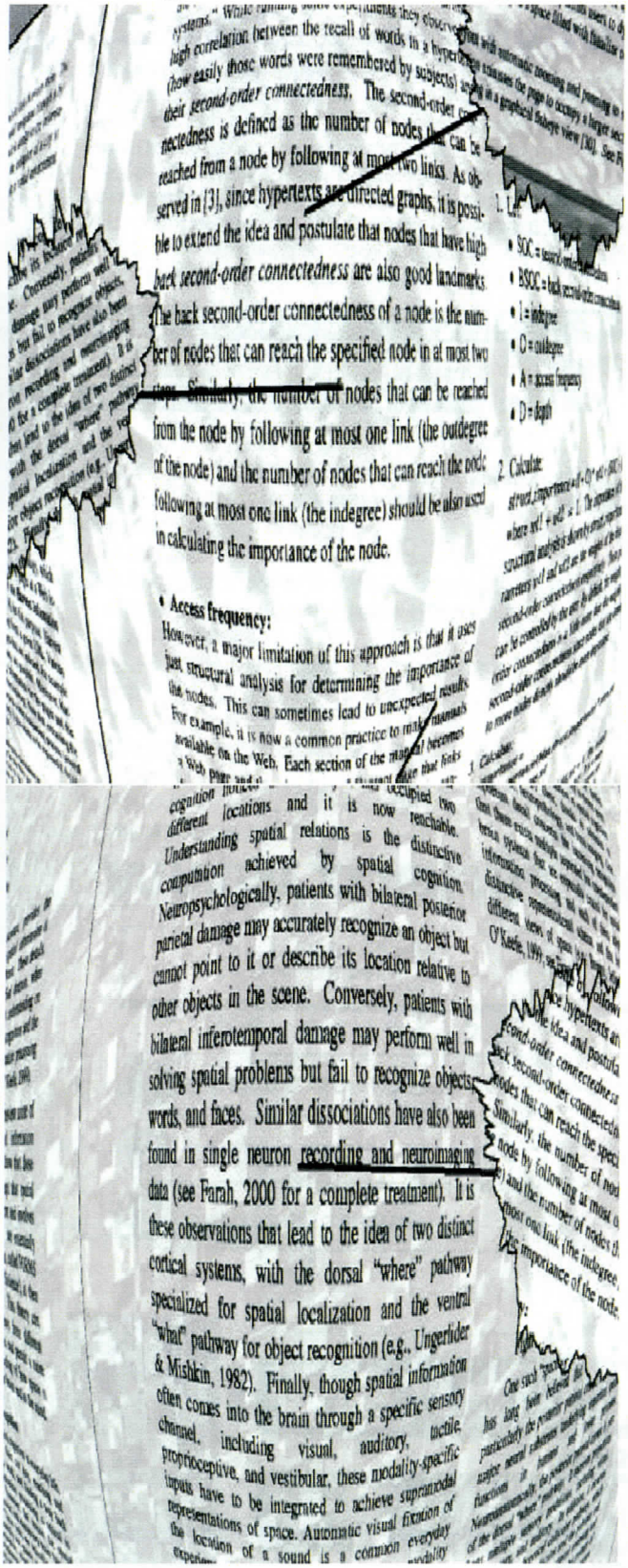

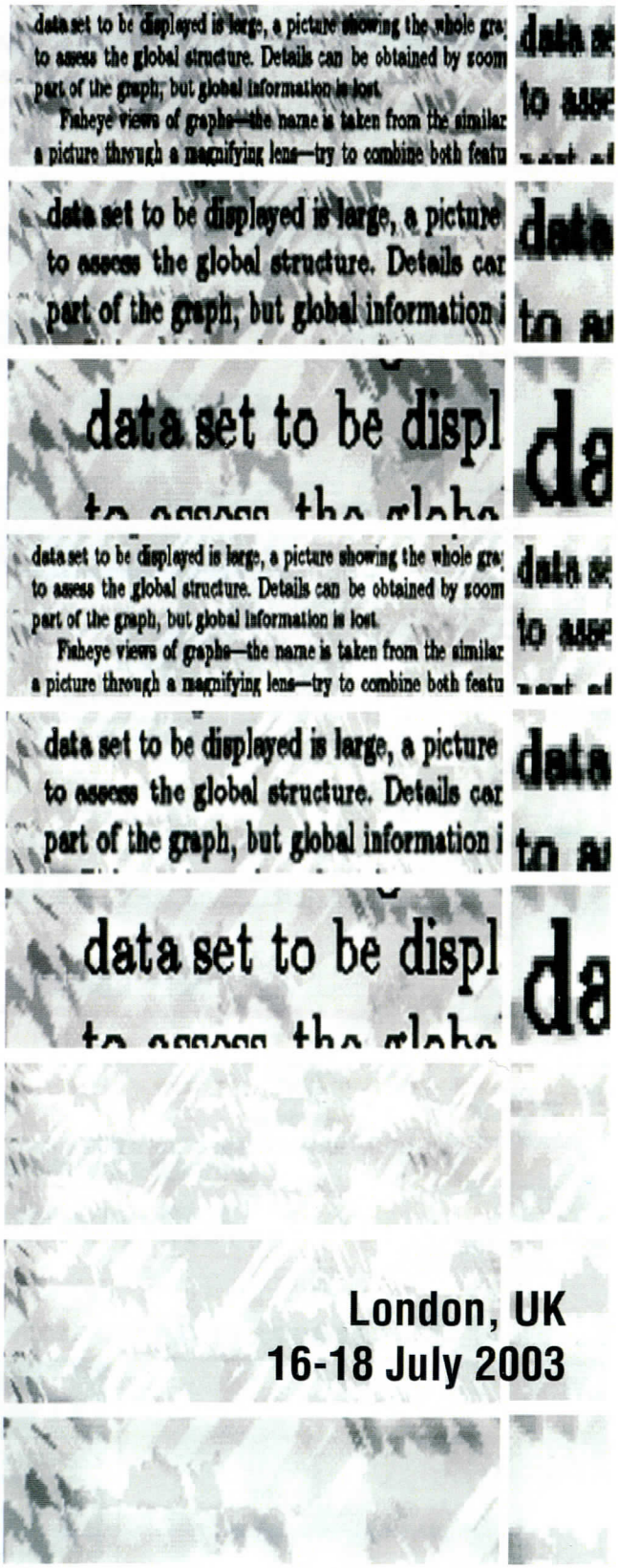

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Recreating Our Selves: ZENetic Computer

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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.

Keywords: *Narrative technology, Editorial Engineering, Cognitive consciousness.*

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. 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.

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 Input

3.1.1 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. These five concepts of personality based on *goun* can be summarized as follows.

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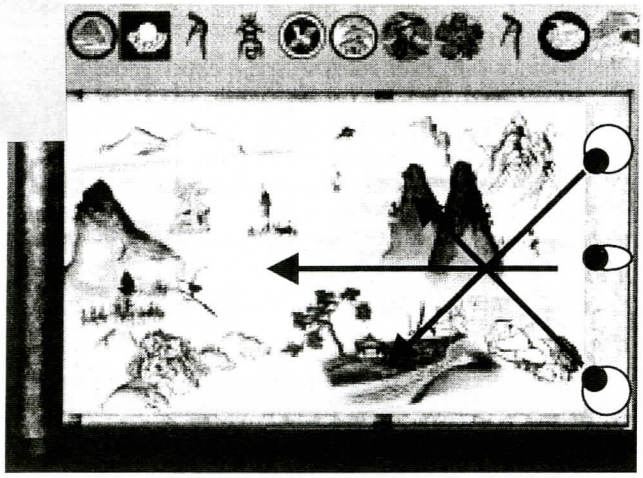

Figure1 3D Ink painting *Sansui* Engine

a) 色 (*Shiki)* is how nature and materials actually exist.

b) 受 (*Jyu*) is the intuitive impression.

c) 想 (*So)* is the perceived image.

d) 行 (*Gyo)* is the process of mind that activates your behavior.

e) 識 (*Shiki)* is the deep mental process that lies behind all of the above processes.

3.1.2. Mechanism of the engine classifies invisible personality for user

Personal subconscious information from Ink Painting by NN
Input---12Elements * 3position = 36 unit
Output---S1(Goun Information) One unit
Teaching data of NN-----10 kinds of +/-Goun

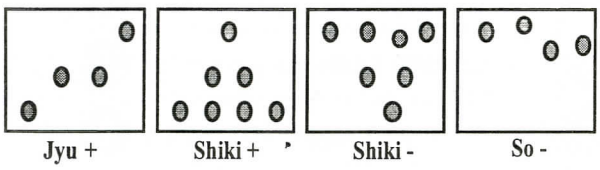

Figure2 Example Composition of the picture

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 Generation

3.2.1 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.

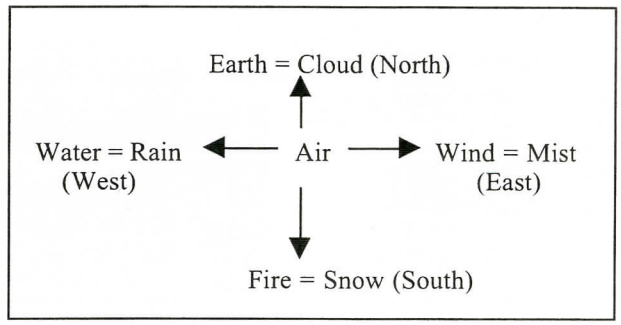

Figure3 *"Godai"*

Context generation depends on the user's *goun* information (see above) from the Zen Buddhism interaction. The *MA*-Interaction wakes users from the chaotic hodgepodge of the fragmentary stories and compels them to use their heightened imagination to create a unified story. This response of a clarified vision is akin to the sudden realization of the nature of things by a student who is given a confounding *koan* question by a ZEN Master.

3.2.2 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: How many times the mouse is clicked vs. the distance between the locations of consecutive clicks on this model's tablet interface.

ZEN Interaction2: 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 Interaction3: Which part of the animated catfish on this model's interface the user picks up (head vs. stomach vs. tail)

ZEN Interaction4: Timing of the user's handclapping 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[8][9] 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.

3.2.3 "Trigger level" of Zen Master Chaos

The Zen Master's "trigger" is determined by the distance between the user's *goun* data (reflecting the user's hidden personality) and the target point or compromise point as a result of the interaction. This distance can be interpreted as the amount of change experienced by the user's consciousness. Essentially, as outlined below, there is an inverse relationship between this distance and the amount of influence, or trigger, the Zen Master exerts over the user.

Far distance (i.e., user consciousness experiences a big change)

=> Small Trigger (Zen Master will give a small trigger to User.

Middle distance (i.e., user consciousness experiences a partial—'half'—change)

=> Half Trigger (Zen Master and User have an equality relationship)

Small distance (i.e., user consciousness experiences only a slight change)

=> Big Trigger (Zen Master will give a big trigger to User)

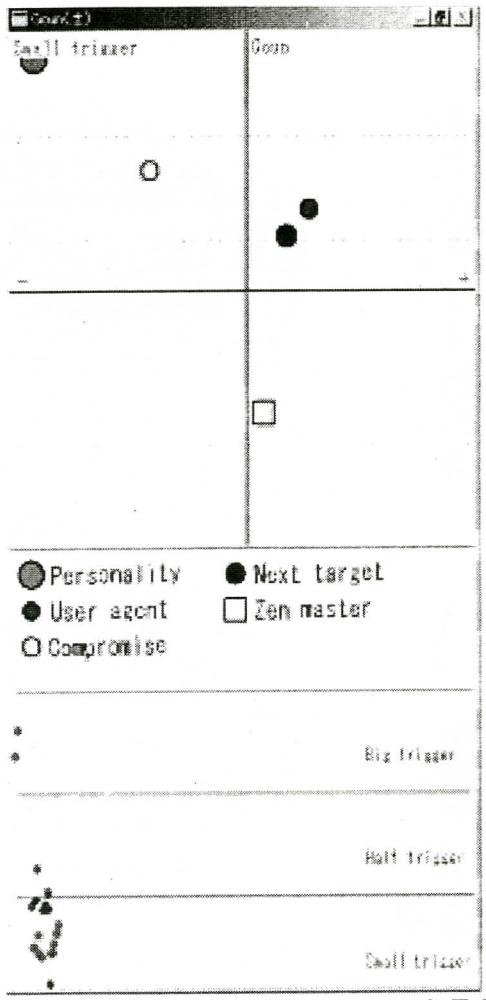

Figure4 Story generation and Trigger level by chaos engine

3.3 OUTPUT

Ubiquitous character: Zen Master Chaos

Zen Master Chaos migrates to a character depending on the user's trigger level result. The reached point in the

interaction becomes the output data for the next context. Our system provides three kinds of output:

1) *Goun* data based on the Zen Master's position in the interaction space.
2) Migrated data from the trigger level determined for the user.
3) Emotion Map from the facial expression of the character in the interaction.

How the trigger level corresponds to a character

Depending on the user's trigger level, the next scene will be generated by using sound and images. Here are some examples:

*In the 3D sansui picture: the Zen Master migrates to a certain object in the interaction space. Then his speech changes depending on the user's trigger level.

*In the Zen Interaction scene:
1) Catching the catfish with a gourd: the Zen Master migrates to the animated catfish. Then he makes movements as the catfish based on the user's trigger level.
2) The Zen Master migrates to the old Storyteller. In this character, he then changes his speech depending on the User's trigger level.

As a further implementation, the ink-painting engine based on computer graphics can be integrated with a Zen Buddhist Rock Garden Interface to enhance the physical reality of the *MA*-Interaction.

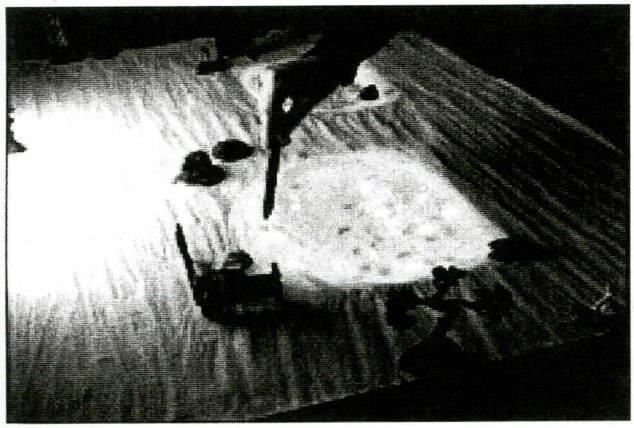

Figure5 Rock Garden Interface

4. Software Integration:

1) User makes ink-painting picture by manipulating symbolic icons.
2) User's hidden self is classified according to its *goun* by Neural Net.
3) User enters his or her picture and journey begins. Haiku is used to generate a fragmentary story that's illustrated in *sansui* 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).

5. Hardware Integration:

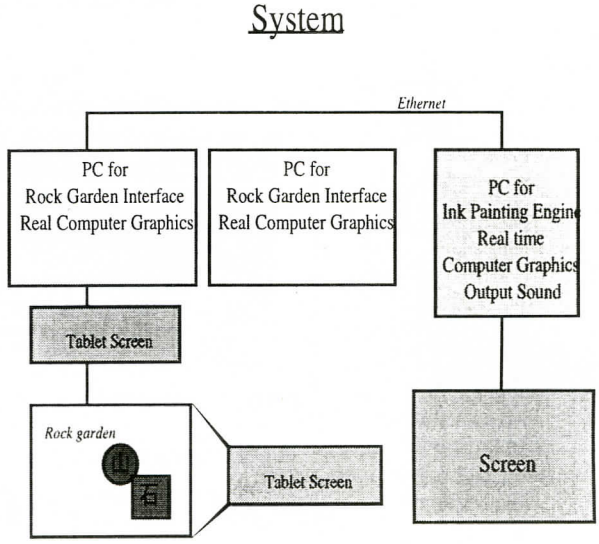

Figure6 Hardware System

6. Discussion:

This is art & technology research on a narrative way to use subconscious information in a computerized, chaos-driven experience.[8][9] The operating principle of this system is "story," which here means the subconscious interplay between humans or between a human and nature. The result of this process manifests in our subconscious or conscious interpretation of such interactive communication.
This system prompts users to form relationships from fragmentary scraps of consciousness and to integrate these components into a unified self through the mental "awakening" inherent in Zen Buddhism training. Therefore, this research makes a clear departure from the traditional thinking on how to adopt interactive technology.

This means that our vision of the human-computer relationship should not be bound to conventional notions of the man-machine relationship. This higher vision of how humans and computers interact is our final goal in devising a true symbiosis for a system that achieves satisfying harmony between humans and computers

7. Conclusions and Future Work

We gave a questionnaire to users who had experienced the ZENetic Computer. From this, we received the interesting result that everybody felt relaxed in a way that they had never felt before. A conventional interactive system works by controlling the user's behavior. However, our system allows users extremely wide latitude for free interaction.

Our revolutionary concept is that a system should not direct the reactions of user but that users should continually think about the meaning of their answers and about the meaning of the interaction itself. This new approach was applied so that flexible reactions could be made depending on each person, even with consideration given to the user's particular sense of humor expressed in the interaction. Consequently, a new way of creating interactive contents also needs to be developed.

This system will be exhibited at the MIT Museum and later at other venues worldwide. Future work will involve expanding the range of how we apply synchronized chaos, for example over a networked environment, to the storyteller engine and real-time computer graphics. Also, we will develop this engine so that it can perform sentence control interactively. Moreover, this future engine will carry out all story control operations by incorporating the user's unconsciousness.

8. ACKNOWLEDGMENTS

Thanks to Dr. Peter Davis for helping to design and tune the chaos engine.

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Recreating Ourselves: ZENetic Computer

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Abstract

We tried to develop an interactive system that could help us recreate ourselves by adopting Buddhist principles, Asian philosophy, and traditional Japanese culture through the inspirational media of ink painting, kimono and haiku. "Recreating ourselves" means our 'daily self' meeting our hidden self through wondering something or, in other words, our consciousness and unconsciousness melding in complete harmony. It is difficult to achieve this experience through traditional logic-based interaction.We succeeded in reaching this goal by making the above types of images the target of scientific computing. [1] We applied the following five processes to develop a system that could give users the experience of "recreating ourselves."

1. Description of artistic concept

1) We created a virtual world through images of the Asian *sansui* ink-painting world, which are difficult to experience in daily life. This makes it possible to awake of our daily consciousness.

2) In the virtual world, users enter a story that shakes their consciousness. This is not a complete story, such as those in the movies or novels, but fragments of short stories. Experiencing these stories makes users uneasy and invokes their unconscious desire to emergent a whole story by linking these fragmente of stories.[2]

3) In each of these inchoate stories, the interactions invoke Zen dialogues or Haiku by allegorical comunication. The users are asked questions that do not have "correct" answers. They are forced to deal with these ambiguous provocations and thus they unconsciously try to answer the questions. This unconscious effort gives the users the direction to find from one short story to another and to link them.[3]

4) Both the questions the user poses to an object of this interactive system and the unconsciousness exerted in trying to link the fragmentary stories decrease the distance between our daily self and our hidden self. This is called MA-Interaction.[5]

5) Finally, the users have a dialogue with a "bull," which has frequently been used as a metaphor of our hidden self in Zen Buddhism. Through this dialogue, they have a virtual experience of unifying their daily self and their recreating self.

2. Technical realization

2-1Digital *Sunsui* (ink-painting) Engine

We have developed a 3D interactive ink-painting engine by utilizing its original perspective called *sanen*, where one picture has three viewpoints. (figure1)

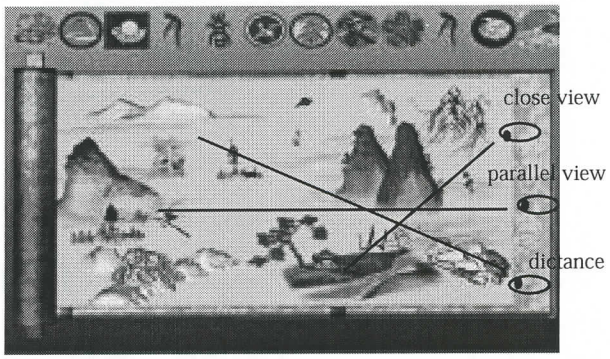

figure1

Depending on how users draw an ink-painting, the engine classifies their invisible personality by using a neural network and utilizing the Buddhist concept of *goun*, which says that five basic spirits and materials make up our world.
The nature of "*Goun*" can be understood as embodying the following concepts.

a) "Shiki" is how the nature and materials should exist.
b) "Jyu" is the intuitive impression
c) "So" is the perceived image
d) "Gyo" is the process of mind that activates your behavior.
e) "Shiki" is the deep mind process that lies behind all of the above processes

The engine mechanism classifies the personality of the user
1)Personal subconscious information from Ink Painting by NN. (figure2)

Input ——12 Elements x 3 positions = 36 units
Output — S1 (Goun Information) One unit
2) Teaching data of NN for five kinds of +/- Goun

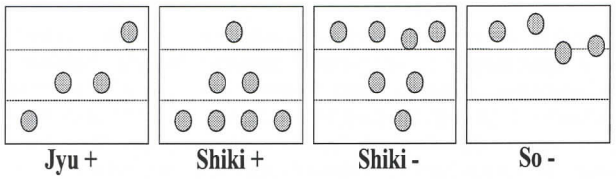

figure 2. Example Composition of the pictures

Then, the users can enter their own 3D ink-painting picture. Depending on their personality, various stories are generated.

2-2. Story-teller generated to MA-Interaction by algorithm based on chaos theory

This is a symbol and allegorical interaction model based on 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, air, and earth. *"Godai"* (figure3)

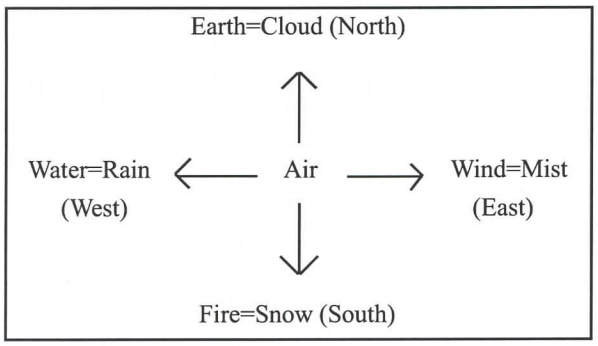

figure3

Context generation changes depending on the user's *goun* information from the Zen Buddhism interaction. The MA-Interaction wakes users from the hodgepodge of individual fragmentary stories and compels them to make a unified story with their own imagination.

Mechanism of Generate for Story by Chaos algorithm

1) Initial state of personal subconscious information

Goun +/- , Initial value St(0)

State St(I) generate form ZEN Communication Interaction by Mat(x)

State St(2)="Next Target" generated from Interaction result

"ZEN Master" generated from Chaos 1

"User agent" generated from Chaos 2

"Compromise point" generate from Chaos 3

St(1) = Mat (ZEN Koan 1) x St(0)

St(2) = Mat (ZEN Koan 2) x St(1)

.

.

Matrix = F(a,b)

2) State of Parameter St(I) = (S1(I), S2(I))

(S1, S2) is two-dimensiond parameter (Goun, +/-)

(S1, S2) renewed by ZEN Communication Interaction

(S1(n+1), S2(n+1)) <——F(S1(n), S2(n)) = F(a,b)

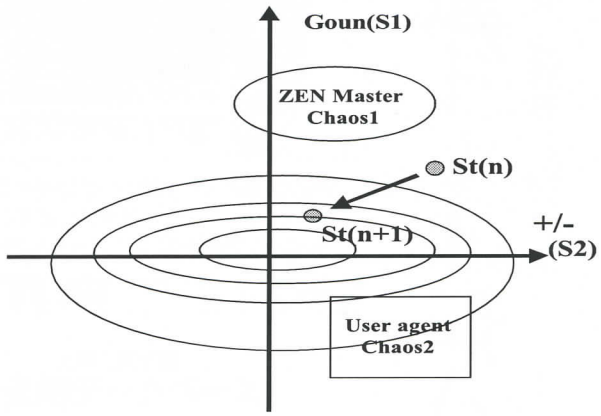

figure4

MA-Interaction is technically generated from chaos.[6]

First, depending on the user's invisible personality data from "Goun", context is generated by ZEN communication.

Then, the St(1)point is decided from user interaction during ZEN communication

The St(2) point (next target) is decided from the user interaction result.(figure4)

As user data move from St(1) to St(2), Chaos2(User agent) tries to synchronize with the user data. But Chaos1 (ZEN Master) moves to attack the user data.

If Chaos2 can synchronize with the user data, the user data can reach the next target.[7]

But, if it can not, the next target becomes a "compromise" point. Oh no…This is our daily behavior. We should awaken to consciousness. The "compromise" point also generates chaos. When the user data have too much success in reaching the next target, the ZEN Master Chaos will become stronger to attack the user data!

Furthermore, the ink-painting engine made by computer graphics can be virtually integrated with a Rock Garden Interface to enhance the physical reality of the MA-Interaction. (figure5)

figure5

3. Software integration

1) User makes ink-painting picture using symbolic icons.
2) User's hidden self is classified in "Goun" by Neural Net.
3) User enters their picture and journey begins.
   Haiku generates fragmentary story in Sansui.
4) Ma-Interaction generated from ZEN communication with chaos.
5) The Ten Bulls Story Interactio
   (Zen method by Ten Pictures)

4. Hardware integration

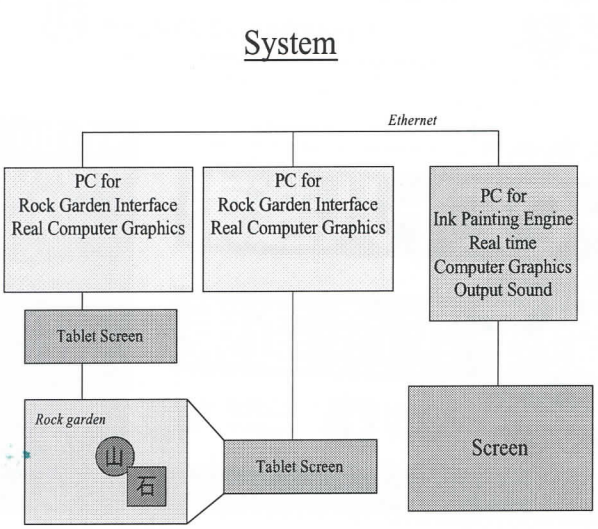

figure6

5. Conclusions

This is art & technology research for narrative way from subconscious information.[8][9]
This Interactive Art decide show at Harvard University and MIT Museum in 2003.
The operating principle of this system is "story," which here means the subconscious interplay between humans or between a human and nature. The result of this process manifests in our subconscious or conscious interpretation of such interactive communication.
This system attempts to form relationships from fragmentary scraps of consciousness and to integrate these components into a unified self used by ZEN Buddhism way.
Thus, this research makes a clear departure from the traditional thinking on how to adopt interactive technology.
This means that our vision of the human-computer relationship should not be bound to conventional notions of the man-machine relationship. This higher vision of how humans and computers interact is our final goal in devising a true symbiosis for a system that achieves satisfying harmony between humans and computers.

References

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