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The Secret

Meng-Han Chuang's
Thesis Paper

The



Secret

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Approvals

The



Secret

Rochester Institute of Technology

A Thesis submitted to the Faculty of the College of Imaging Arts and
Sciences in candidacy for the degree of Master of Fine Arts.

The Secret

by

Meng-Han Chuang

August, 11, 1997

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Introduction

The purpose of my thesis, “The Secret”, is to let a user experience a piece of life and learn how to respect the important secrets of nature by the method of adventure games.

In this project I have used an opening animation to bring the user to Africa and several entrances to reach the different games as well as a main room to give the user hints and choices of games. There are five games to test the capabilities of the user: A room which has two doors to try the user's luck and a skeleton to examine the wisdom of user. These five games and the whole concept of the project are based on reality.

“This is not a game. It is a piece of life, but life is one way. There is no way back.” In the opening animation, I wrote these sentences to make the user think about choices in life. Generally, in people's daily lives, they may encounter several problems. Some of them are easy to solve but some are not. Users may need to pay a lot of attention and use knowledge and strength to solve the problems. Sometimes, everything might be useless but luck. In this thesis, I not only use the concepts for solving problems but also give idea of protecting our environment.

A great invention or discovery may improve our lives. However, in some different points of view a discovery may change the order or

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balance of nature. A statement which was made in the movie “Jurassic Park” was very interesting and described my concept well. It said, “God created dinosaurs, God destroyed dinosaurs, God created human beings, human beings destroyed God and human beings created dinosaurs.” In my opinion, scientists or anyone else should not invent or discover something without considering the results. Intelligence and wisdom are always totally different.

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Research

My thesis research began from thinking about the choices we make in life. In the very beginning, I wanted to create games using Lingo for Macromedia Director. I needed ideas to make the games fun, but not too difficult, and, at the same time, challenge the mind. Therefore, I browsed the games on the market, in the library, and on the Internet. I found that were very interesting. I bought *Puppet Motel*, *Zork* and *9 (The Last Resort)* from the bookstore Borders, and found several traditional games of Africa from the Wallace Memorial Library at Rochester Institute of Technology. I downloaded many different types of games from the Internet (www.download.com and www.macplay.com). By researching and playing other games, I developed several ideas for making my own games, but I needed a story to connect them with an overall theme.

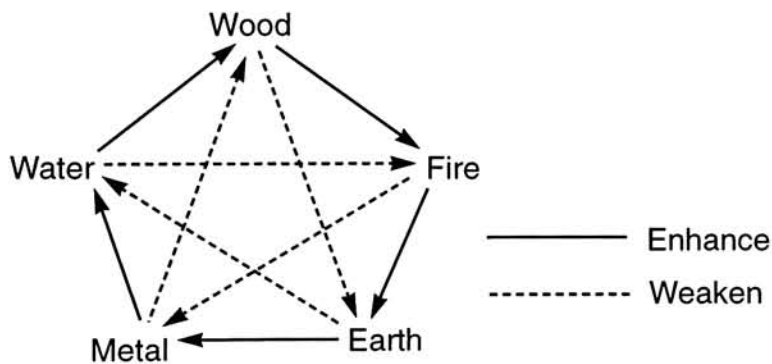
“Nature” is a major concept of my thesis paper. I believe keeping the earth clean and peaceful is very important, and I wanted to do my best through my thesis as a graduate student of computer graphics design to spread this idea to as many people as possible.

I needed to find an unexplored land on the earth. A place without high buildings, traffic jams, and air pollution. Somewhere, there is a reserve area for all creatures. “Africa” was the best place



for this environment setting because it is clean, primitive, and full of the sources of vitality. Africa contains so many undiscovered things, and it was the best place to store a great secret.

The story setting was an idea from the five basic elements of nature in China: metal, wood, water, fire and earth. These elements have their own characteristics and different relationships to the specific element of the five.



The relationships between these five elements are shown here.

The elements are tightly integrated and fully associated with each other. The sequence of association starts from wood. Wood can enhance fire, fire can enhance earth, earth can enhance metal, metal can enhance water and water enhances wood as the cycle continues. These elements can form a life cycle that generate a life environment for nature and creatures. On the other hand, wood has the ability to weaken earth, earth can weaken water, water can weaken fire, fire can weaken metal and metal can weaken wood, and so on. They each have their own ways to transfer

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or increase the power of one another and they also have the ability to weaken or decrease the energy of their counterparts.

For my thesis, “The Secret,” I wanted the users to understand that life is a cycle, very much like the food chain, the world holds a kind of active balance as each of the five elements protract. Every single element is important to our existence and must be maintained in this chain. No one element is the best, of course, or the worst.

According to these settings, the general ideas of environment and the storyline are built. I needed to create the interface which I wanted to be different from the ordinary interactive games bought off the shelf. In this project I wanted to create the feeling of mystery, weirdness, prestige and the untouchable, and also the excitement for users to explore the secrets and to solve the five difficult and mind challenging problems. To be an effective game designer, I tried to be a user and experimented with several games which are out on the market. *Puppet Motel* and *9 (The Last Resort)* are two of my favorite games. In *Puppet Motel*, there are several effects which build the mood of “mystery” and “enigma” successfully. In its main menu, the author used a tunnel and some animated symbols to welcome users to go into the darkness. On the left wall of the tunnel a few white icons showed and disappeared like ghosts. These icons lead users to

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different rooms to experience the feeling of *Puppet Motel*.

9 (*The Last Resort*), is a highly interactive game. The symbols, illustrations, and the problems for solving are full of variety and fun. Sound is a very important element of this game because users need to listen to the sound for a hint to find the line and pass the test to reach the goal.

Using these two games as research tools, I gained a lot of good ideas to use in my thesis project, and I also realized that every detail in the project had to have the same style and feeling to match the theme of the whole project to keep it unified

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Procedures

1. Developing the game concept
2. Making the game functional
3. Navigation
4. Building the environment
5. Solving the problems of file size and color palettes
6. Sound

Developing the game concept

I set out to create a thesis which was weird but easy to understand. I tried my best to examine the information which related to my thesis. I made a list of the ideas that I had seen from movies, cartoons, comics, novels, and anything else that came out of my head. Based on these ideas, I created several storyboards. One of the examples was about a professor who is working for The British Museum. He found out the secret of the five basic elements and asked his assistant to find them and bring them back to him. When the assistant reached Africa, he realized that it was very difficult to pass the five tests and get the sculptures which are referred to the five elements. The assistant had to find the entrance on a tree to the wood game. And the entrance for the

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metal game is in a gold mine. The entrance of the earth game is represented by the hole of a volcano showing earth. If the assistant wants to go into the room which represents water, he needs a “water gate” which is a circle made by bamboo and vine. By putting this water gate onto the surface of water, he is able to jump in and through the different dimensions and reach the room that has a sculpture for water.

However, there is no entrance to enter the room which represents fire. The assistant needs to hold a small sculpture, which is the key to enter the “fire room.” By holding it and burning himself, his soul is lead into the room. During this time, a native has to put his body in water and set the water gate on top of his head. Once the assistant passes the test, his soul can return into his body and his body will be forced to pass the water gate to cure the burning scars.

This story looks more exciting than the one I made, but the feeling and the focus were too far from my original purpose. Therefore, I didn't choose to create this story for my project. Making a decision to keep the secret and protect nature's order is the purpose of this thesis.

Making the game to be functionable

After I had the general idea on the creation of the thesis project, I had to find out what kind of games I needed and the most important

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issue was to make it functional for users in the age range of twelve years and older.

I collected seven different ideas for the games.

- maze
- puzzle
- spear toss
- scrambled masks
- climb to reach the goal
- working gears
- math

I needed to choose five games to be the parts of my thesis project. Each game should be different from one another and have the characteristics of the goals to test the users. Therefore, I chose the maze for testing patience and care; the puzzle for testing the intelligence; the spear toss for testing reactions and reflexive nature; the scrambled masks for testing the intellect; and the climb to reach the goal for testing courage.

In the maze game, the direction of the moving object was opposite from the direction of the mouse movement. Therefore, I counted the distance of the mouse change (the new mouse location minus the old mouse location). If the vertical change is positive that

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meant the mouse moved down then I should set the vertical location of the object to the original object location minus the vertical amount of the mouse changing. Then the object will move to the opposite direction of the mouse movement.

In the puzzle game, if the user selects a piece of puzzle and places it in the right position, it will change color and show that the user had selected the correct location. The key of doing this was to put the changed-color puzzle pieces in the right position and set them to invisible. Once the right piece was dropped, I reset the location of the piece which users had just dropped out of stage and set the piece with the changed color and the sprite on the correct position changed to visible.

In the spear toss game, I used the Alias to make the 3D animation of the spears' moving. And I cropped the certain parts of the spears frame by frame to place them as sequences in Director. When one of the spears intersects the character of user then play the sound of getting hurt. I think this is the simplest way to make this game.

About the game of scrambled masks, It was an idea from the CD-ROM 9 (*The Last Resort*). But, of course, I did not have the source code for the program. To do it in my own way is the solution for it. I used "lists" to store the data of the order of the masks. There is one list

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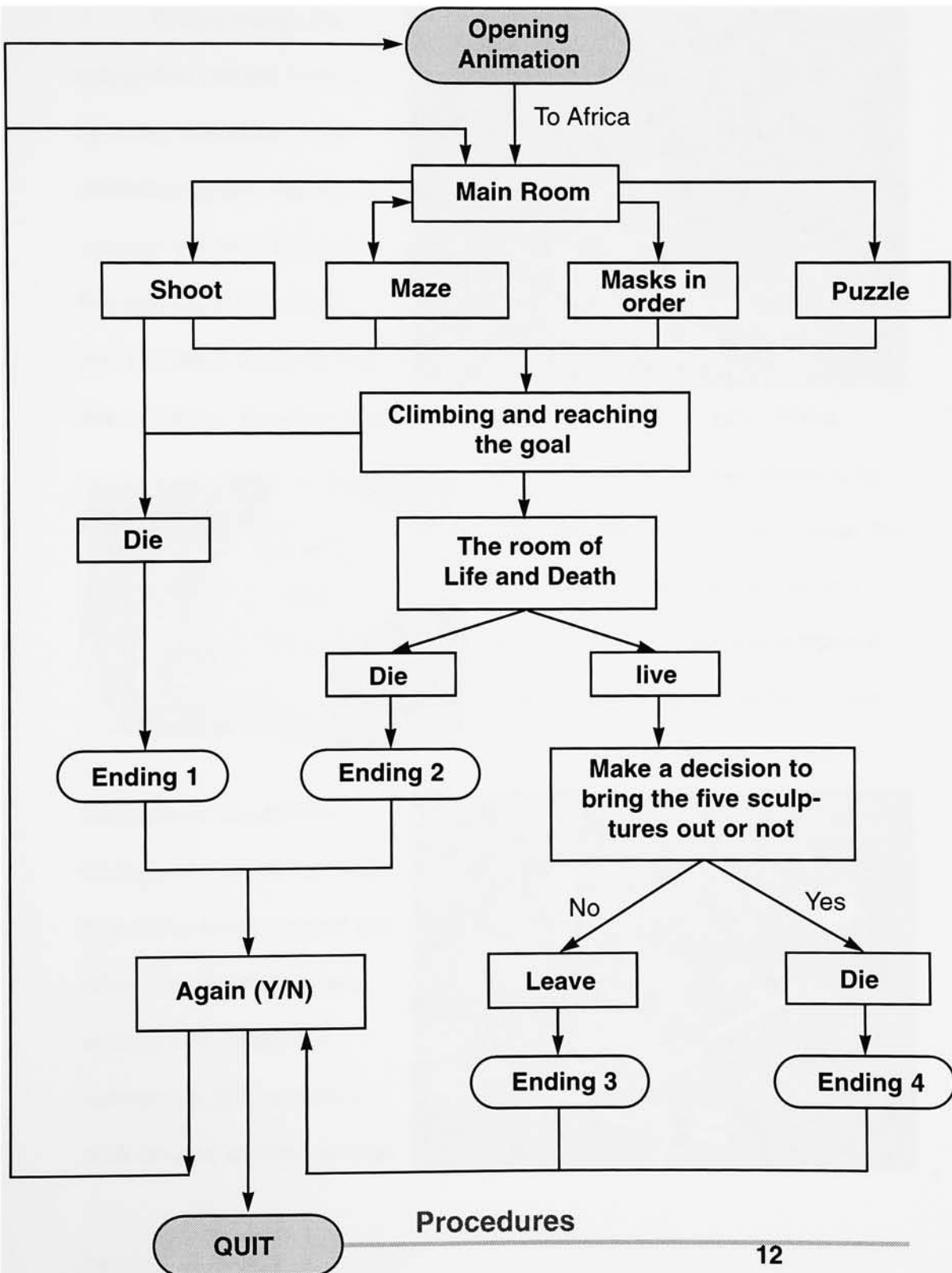
that stores the answer which is generated randomly. Each time the game starts, It has a different problem to solve. The other list stores the current order of the masks. Once these two lists are the same, the users pass the game.

The game for climb to reach the goal was created by using Object Orient Programming (OOP). I set the character which presents the users to be an object. It will change the directions to the way it goes. I also set the skulls and bones which are dropping down to be the objects, then they have their own dropping speed and showing location. Using OOP to create a game is one of the masterful ways to have more variety and fun.

To make all the five games functional is the most fun part of my thesis, I really enjoy it.

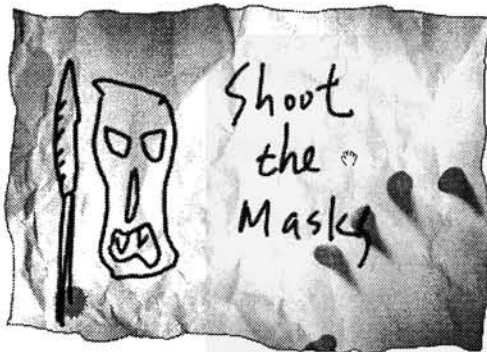
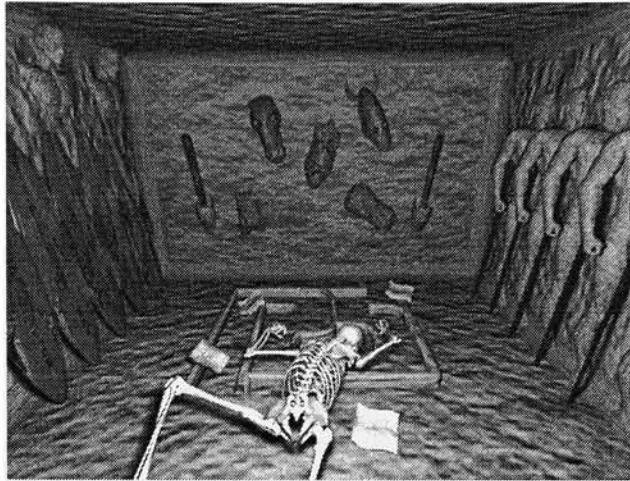
Navigation

The structure chart of the thesis is shown on the next page.



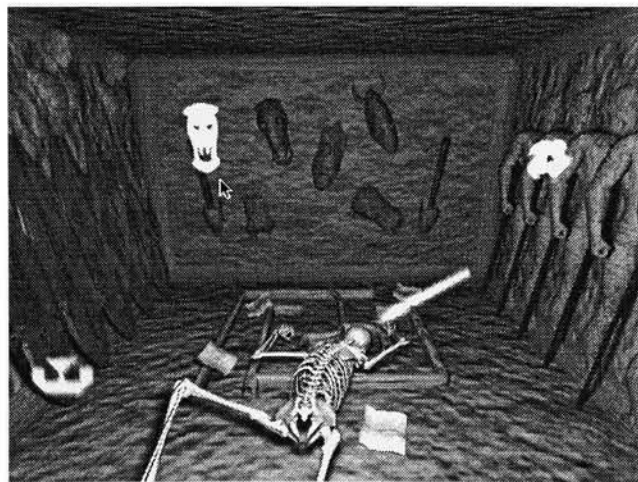


In this thesis, the navigation begins from an opening animation. The animation gives users a mission which is to bring the five sculptures back, and provides a hint to find the entrance. After the opening sequence, the stage is set to Africa.



Users need to find the entrance by the given hint. When users enter the main room, they have to find four sheets which contain the important clues for passing the games. Once users review all the sheets, the

background sound will change and users can find four white icons around the room. The four icons will appear and disappear repeatedly. Users have to click on one of them and go

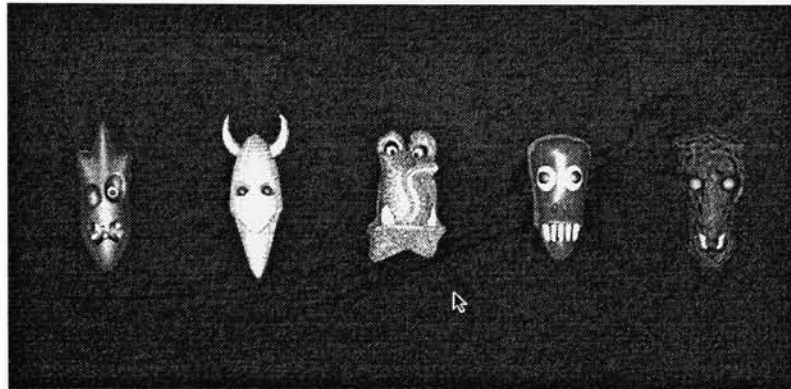


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to the game.

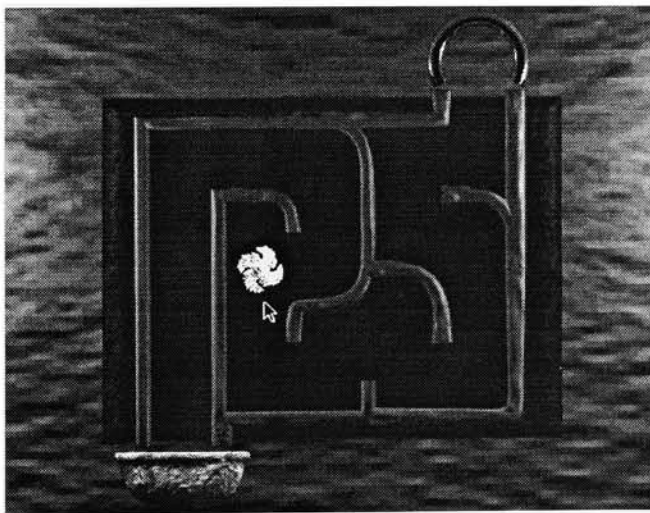
The game *scrambled masks* needs users to find the correct order between these five masks. Users are able to drag the mask horizontally.

When users release the mouse button, the mask which is just dragged will shake its



head up and down to say “yes” or left and right to say “no.” The same situation will happen with the two masks which are beside the clicked one. Therefore, the user can use this information to find out the answer.

The following game is *maze*. Users need to drag a spinning icon



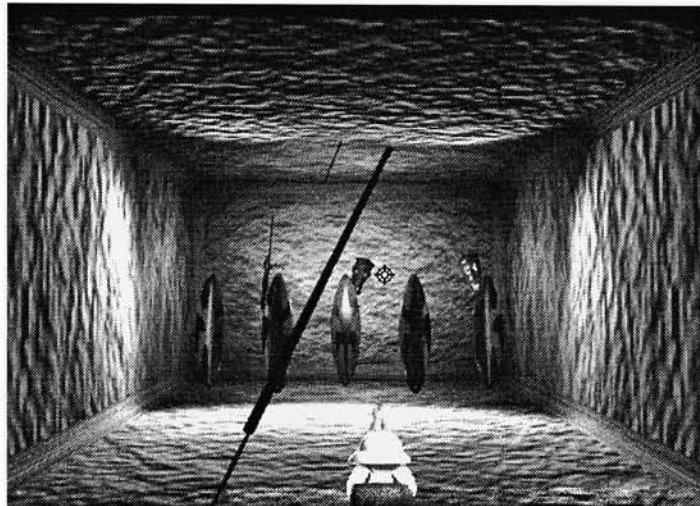
through the maze. The icon is not allowed to touch the edges of the maze. If it touches, the icon will be set to the starting position and change the color to approach red. Users

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have two chances to touch the edges, after that, the game is over and the stage is set to the main room, and the user has to start everything again. Once the user passes the game, the maze board will separate and open to show the one sculpture of the five. The difficulty of this game is that the moving direction of the spinning icon is opposite from the mouse moving.

After “maze”, it leads the user to “spear toss.” During this game, users have to not only escape from the spears but also shoot the five masks which hide



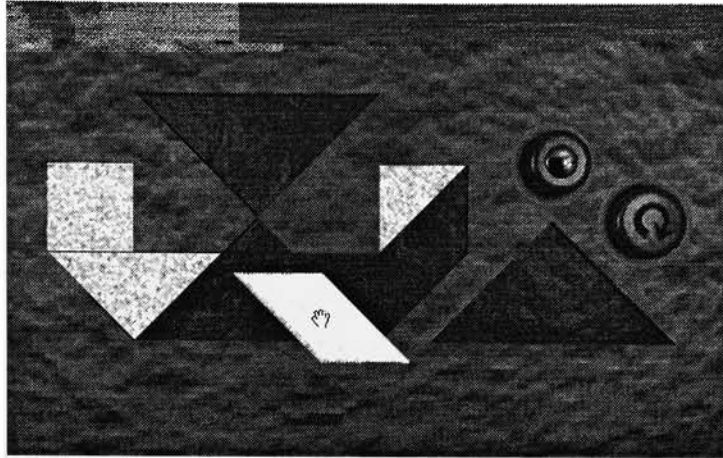
behind the shield. I asked some people to test this game when I finished it. The response was too easy to die. I had to give them more chances to live and shoot the masks. Therefore, the first and second time the users' character is hit by spears, it will just generate the voice of hurt. On the third time the character is hit, It will play the voice of death and finish the game. When users shoot all the masks and obtain the sculpture, the game “puzzle” will appear.

The



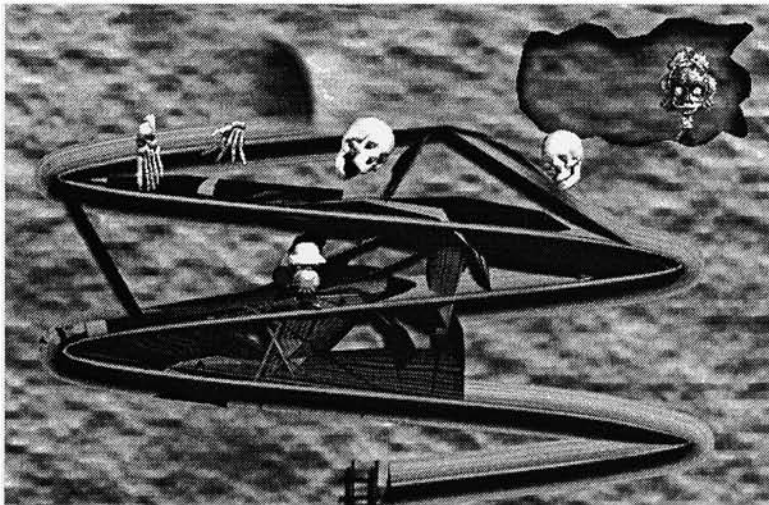
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In the game “puzzle,” users need to put seven pieces of puzzles on the correct position for a certain shape. There are two buttons on



the stage. One can generate the different pieces of the puzzle. The other one can turn the puzzles to make more possibilities for users to think.

If users finish all four games, the fifth game will be shown. It is called “Climb to reach the goal.” In the beginning of this game, users have to look around the whole environment, and find out the clue for



this game. Once users go to the second level, the stage shows a curved path and there are many skulls and

bones that fall down from the top of the stage. Users need to control the character which presents itself to the user and it then must run

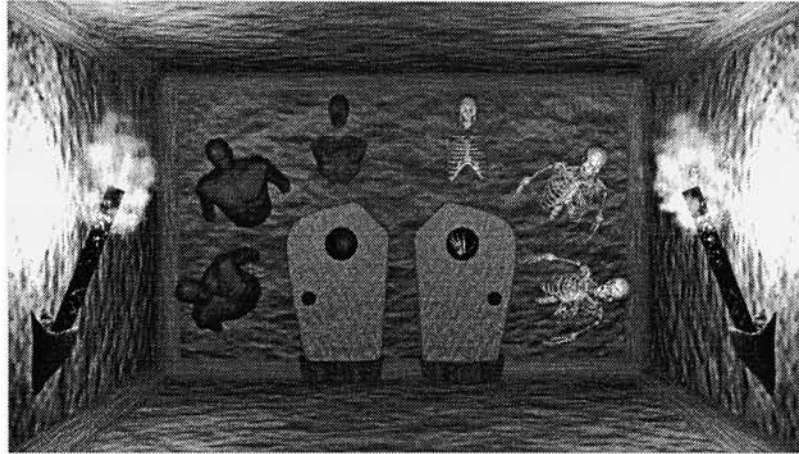
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along the curve path to reach the sculpture at the top. If the user is successful, they will be led to another room, otherwise, they die.

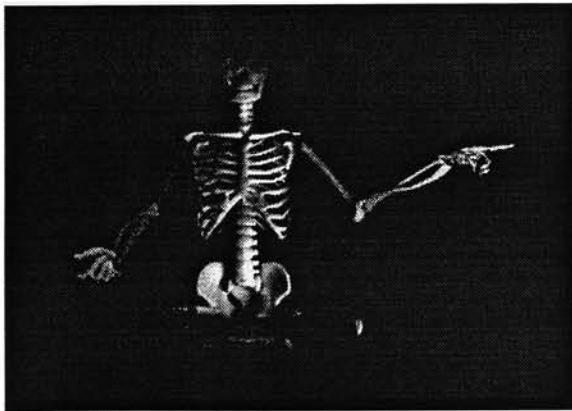
The following room is for users to choose to live or die. There are two doors in

this room, one leads to life, the other leads to death. All the user can do is pick a door and



try their luck. If they are lucky to choose the right door, then it will show a skeleton who explains the importance of these five sculptures to the users. It then asks the user to make a decision to return the sculptures to the skeleton or to bring them out.

If the user decides to return them, they are then allowed to leave.



If the user still wants to take the sculptures out, then they will be killed by the skeleton because of not respecting the secret of nature. After all these stages, there are three buttons which

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appear to lead users back to the beginning, to the main room, or quit.

Building the environment

3D graphics and 3D animation were the best parts of my thesis. I used *Alias/Wavefront* on the Silicon Graphics computer (SGI) to create the 3D environment. By using this powerful software, I didn't have to draw as many illustrations and frames. It saved a lot of time for me by eliminating work. Besides, this program has a large texture library and parameters for different detail settings. I made the walls of the rooms with stone texture and set the lighting to generate the soft shadows to enhance the feeling of reality. I was able to make fire and smoke by using the particle system. If anybody has seen the movie "Independence Day", there is a scene of aliens using a light beam to destroy the White House or another movie, "Twister", which shows a tornado blowing away a barn and a tractor into pieces. All these incredible scenes are created by *Alias/Wavefront*. I feel fortunate to be able to use this wonderful software and hardware to produce my thesis.

I encountered two problems in creating the environment. The first problem was having to import an image profile from Macintosh to a SGI machine. It was not a problem for me to use "ftp" to transfer the files. The problem arose when I could not display the image file on the

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window of *Alias/Wavefront*. However, after asking the labbie “Ted” (He is an experimental user of *Alias/Wavefront*) he told me to import the image file as an “image plant”. Then the first problem was solved. I got the profile to draw the accurate curves for a 3D model. Second, I needed some models of the human body and skeleton. Even though the Alias was a very powerful tool and it made 3D models very easily, it was still a difficult job to create such models as human body and skeleton. The software “*Poser 2*” is the perfect solution for this problem. In *Poser 2*, I was able to use the different figures of human bodies, it has male nudes, business, casual, skeleton and stick figures, Also female and child bodies were available. I used this application to change the poses to sit, lay down, stand and hold a spear. These poses show the natives, who were ready for battle, the explorers who died on the ground and the bodies and skeletons which stuck to the wall representing life and death. In the beginning, I tried to export the wire frame files as object file format for *Alias/Wavefront*, but it would not work. Then I used the DXF file format to transfer the 3D models. Although the file sizes were larger than normal, it was the only way I could get it to work. After I had done the environment I felt excited and had achieved so much. Because *Alias/Wavefront* is the most powerful 3D software that I have ever used, it made me feel that I could create

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a virtual world from my imagination.

Solving the problems of file size and color palettes

File size was a very big problem when running the thesis project on a slow device, if the loading speed cannot catch the speed of the program running. QuickTime movies will jump frames and everything will not run smoothly. The animation may not catch the sound, the sound may run out before the whole movie finishes, leaving a part of the movie in silence. Therefore, I needed to find a way to reduce the file size without jeopardizing the quality of the images.

Color palettes are the one of the best solutions for this problem. In some situations, I might just use one color tone but not others, so I can make a color palette only for the single color tone. Two hundred and fifty six colors (256, 8 bits) are quite enough for various color tones. By using the color palette, I can reduce the image size but still keep the images high quality. The program, *Debabelizer*, is a perfect software for making the palettes. It uses batch processing to work on a large amount of image files, and create a “super palette” for those images. Once the super palette is created, the amount of image files can be reduced from 16 bit or 32 bit image files to the 8 bit image files only. The image files and the movie size are reduced, thus the loading problem becomes less

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of an issue.

Sound

After I finished all the visual parts and interactive games, sound became the major obstacle for me. For a student who does not know how to use MIDI or other tools to generate sound effects, it was difficult to give users the “professional feeling.” However, I still could try to use the sound effect CDs and SoundEdit 16 to approach that feeling. I also downloaded a few games from the web, because I thought there would be a lot of good sound effects there. *Abuse Demo 1.01* is a very helpful game downloaded from the internet. In the game, it has its own sound effect folder to contain the sound files. And all of these files can be opened by SoundEdit 16. Therefore, it retains the original quality and is very easy to use.

Sound can be a very good transition during loading the files. I realized this when I was playing the game *9 (The Last Resort)*. If the whole story is designed to have several times to fade to black, that would be the perfect time for author to preload the file with sound. Sound would not make the users feel monotonous during the black stage.

In some Director movies of the thesis, I set the sound to play on frame one and set the cast properties to be loaded after frame one. Therefore, I not only have the image but also have sound during the loading.

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Conclusion

Through my research, processing, and testing, I improved my thesis from concept stage to the final working application. I have learned to integrate 3D interface, 3D animation, images morphing, interesting games and a profound theme. “The Secret”, my thesis, meant a lot to me, it shows all the materials I have learned through the past two years.

During this time I was so glad to meet and interact with many wonderful teachers and classmates. I learned not only about powerful software and technology but the concept of good design from them. Professor Steve Kurtz is one of my advisors who encouraged me to put my thesis project on the internet. He said, “this is the most effective way to make people know you and make it easy for you to find a job.”

I learned a lot by doing this thesis. This was a great opportunity for me to focus on one of my favorite subjects, do the research and make my thoughts become reality. I believe in the concept of spreading the idea of protecting our environment. Therefore, I’d like to put it on my homepage and welcome people to see it.

Conclusion

B i b l i o g r a p h y

URL:

<http://www.download.com>

<http://www.macplay.com>



BOOKS:

Games of the world / Holt, Rinehart and Winston

Game Graphics / Chuck Brunner



SOFTWARE:

Alias / Ver 8.0 / Alias|Wavefront / 1996

Poser / Ver 2.0 / Fractal Design Corp. / 1996

AfterEffects / Ver 3.1 / Adobe System Inc. / 1995

Photoshop / Ver 4.0 / Adobe System Inc. / 1996

Director / Ver 5.0 / Macromedia Inc. / 1997

SoundEdit Pro / Ver 2.0 / Macromedia Inc. / 1996

Studio Pro / Ver 1.75 / Strata Inc. / 1996

Deblazer / Ver 1.65 /Equilibrium/ 1994



HARDWARE:

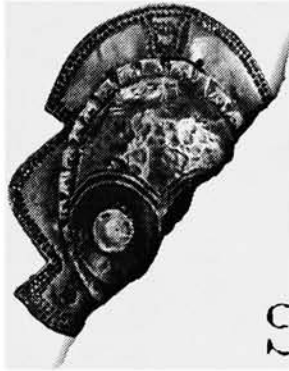
Silicon Graphics Workstation (Indigo 2)

Power Macintosh (7100/80)

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A p p e n d i c e s

The



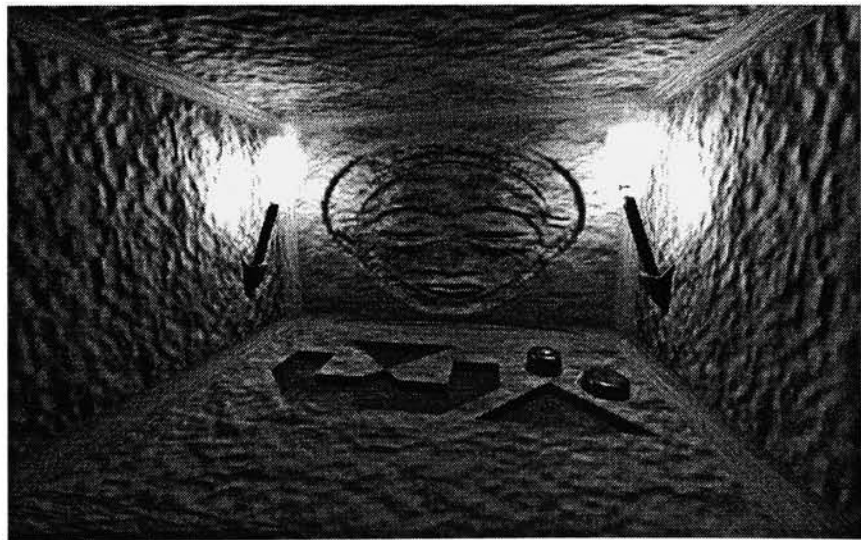
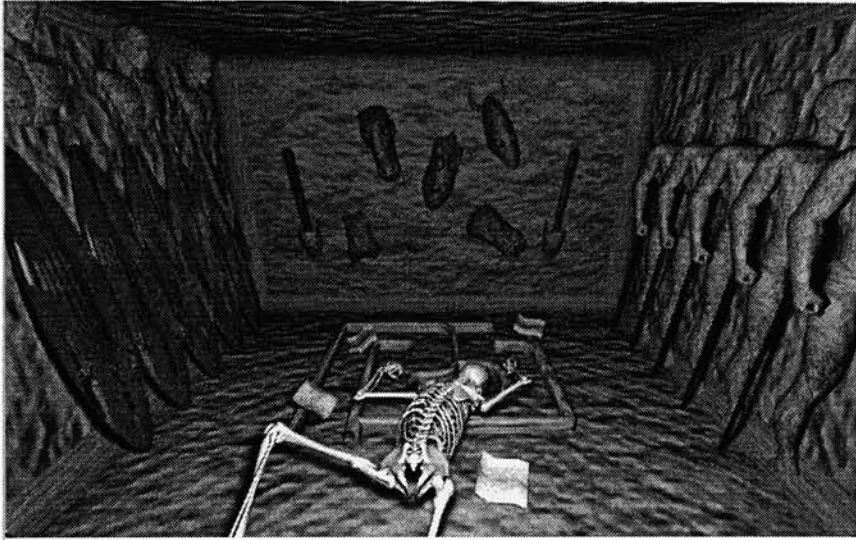
Secret

Please wait for loading

This is not
a game...

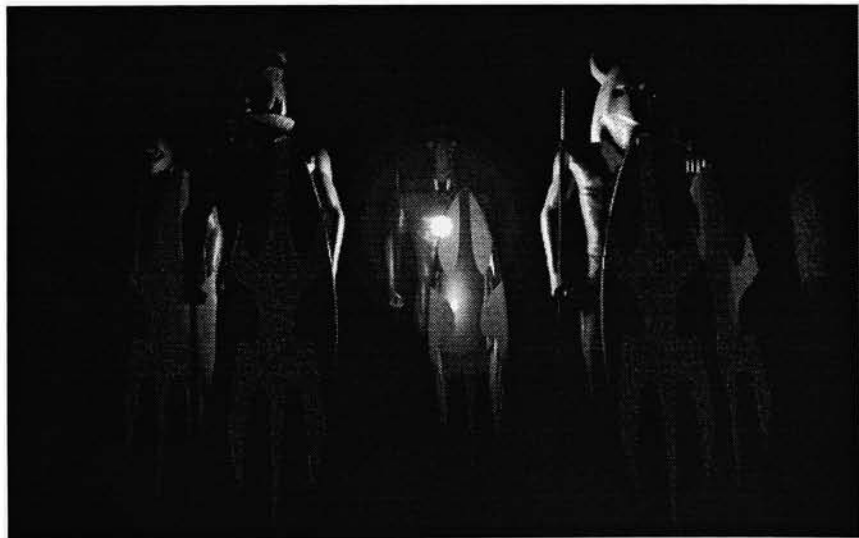
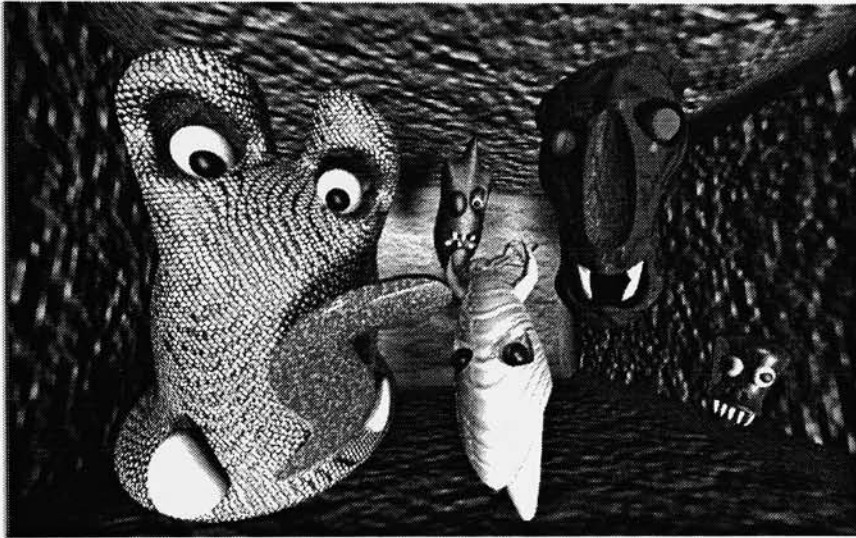
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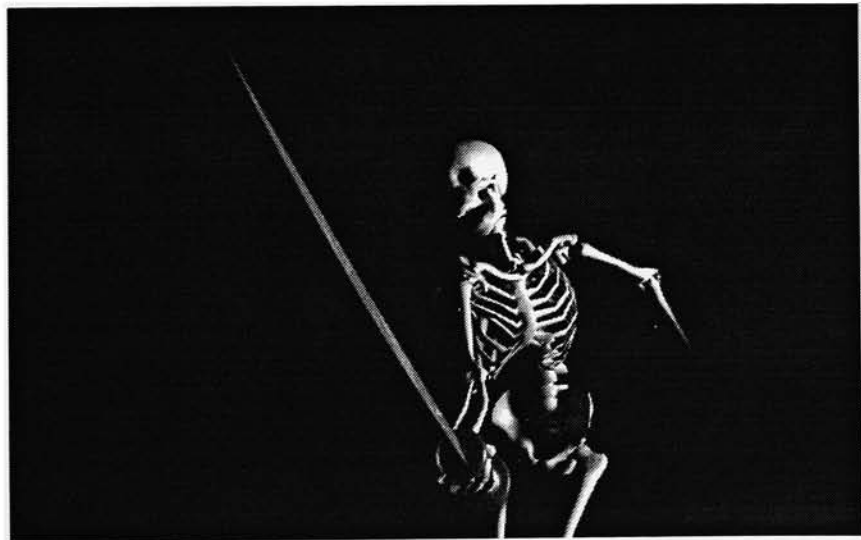
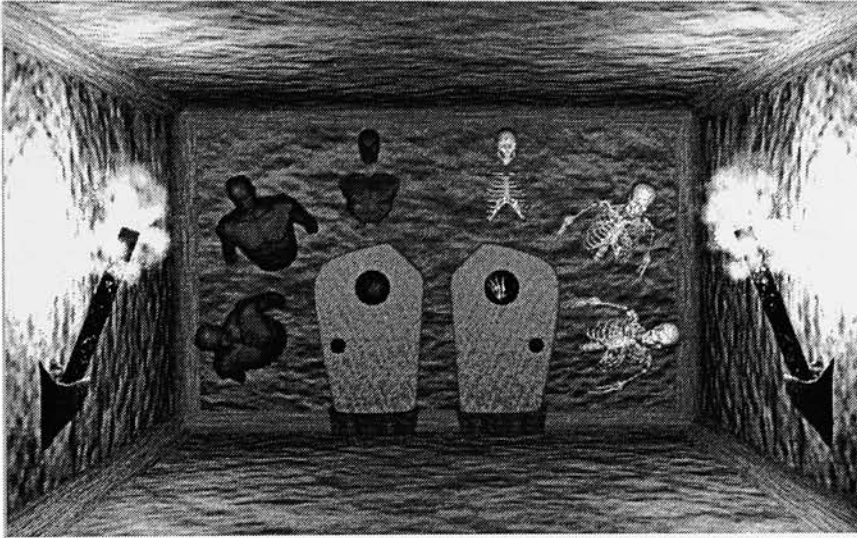
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A p p e n d i c e s



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Appendices



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A p p e n d i c e s

