

Construction of Interactive Visualization

Life and Death of the Star

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ABSTRACT

This paper is a report of Interactive Visualization design. The interactive program we do is Life and Death of the Star. The program is a game for children to play and at the same time, learn information about the changing condition of star.

In this paper, we also mention some theory about interactive designing related to our program.

Author Keywords

Interaction, Communication, Flash, Education, Star Life

MOTIVATION AND INTRODUCTION

E-learning is a big part of interactive design. Because interactive help people to get information quickly and clearly. "Instructional interaction is a sequence of events whose primary purpose is engaging the learner in meaningful activity, providing feedback, and influencing learning", ref 1.

Our program is education game for children. It shows nine different states of star's life time from the born to the final state. Children can control 7 different conditions like "Temperature", "Speed", to get the state change to the next one.

In the design processing, we consider different aspects which children need in this program, like the enough instruction and what is funny for them. We will discuss these theories and their implement in the following part.

THEORY OF INTERACTIVE DESIGN

In interactive design, there are some guidelines we should follow, or at least consider. In this part, we mention several of them related to our program. It may be a bit difficult in understanding if the reader did not understand our program properly. For this situation, our suggestion is read the PROGRAM DESCRIPTION firstly.

The Color

Color has a very powerful expression. It was the first information people get when look at some thing (except for some color blinded man, they can get gray easily than color).

Different colors have different meaning and related to different physiological effects. Red is a color of vitality. It can be shown to increase blood pressure. Blue is usually

associate with the night and thus we feel relaxed and calmed.

In our program, we use blue as back ground to show the peace of night also the universe. We use red, pink and yellow to show the star. This color is more related to the actually color in the really stat picture.

Reaction Time and Feedback

Reaction time is very important for interactive design. People need time to understand the situation and give response. There are different kinds of reaction time need to be considered, like "Mental Processing Time", "Movement Time" and "Device Response Time".

The reaction time is depended upon the distinction of the signal, the amount of visual noise and stimulus-response compatibility. In our system the interaction control are more clear and distinct, the control and the background have different colors so there is no visual noise, and as the user move the slider control to a required value then the star move to its respective state.

Our program is for children to play and learn. So we defined is as a not-high speed game. Children have enough time to try different combination or to learn the combination by see the descriptions.

Feedback is needed to let user know what is happened in the system. There are two levels for this. First is whether their manipulation was got by the system. Second is whether this manipulation can march with their purpose.

In our program, every step has the feedback clearly showing in the middle of the screen. If the combination is right, the screen will show the right state. If the combination is wrong, the screen will show "Please try another combination". If the user is in the description of one state, he can came back to the game easily by press the button in the top which shows "come back to game".

2D Positioning and Selection

"In highly interactive visualization applications, it is useful to have graphical objects function not only as program input – representing data – but also as program input, finding out more about data." Ref 2.

Here is what we consider the positioning in our program.

We have the navigation in the left and top. Because normally, people will see the up and left side first, and navigation is a kind of general information need to get first. The main showing window is in the middle of the screen. It is easy to notice the change happened in the middle. And the group of slides is in the bottom. In cognitive processing, selecting and changing is after the user get information and think about what to do to change the environment. So, the manipulate part in the bottom is easy to accept by user.

Spatial Navigation Metaphors

“The metaphor provides the user with a model that enables the prediction of system behavior given different kinds of input actions.” Ref 2.

“A good metaphor is one that is apt, matches the system well, and is also easy to understand.” Ref 2.

Navigation is information about “where you are” and “where you go”. In our program, we have a good navigation part in the left-to-top looks like an arc. This navigation shows the 9 states of star which we can get in our system. It gives clearly information about what is the game can reach and what is the next state to reach for this one. It also shows the relation beyond all the states. Like “Who is the first?”, “Who lead this one?” ect.

PROGRAM DESCRIPTION

Our program is made by Flash 8.

Our program is a game about life of star, which has a lot of information for children to learn. They can try to control slider to the right combination. Special combination will lead to a state of the star.

There are two main parts of our program, the “instruction” and the “game”. “Instruction” includes 3 pages which are used to explain how to use this program. “Game” part is the main part of our program. In the screen, we have the navigation in the left and top, the main showing window in the middle and the group of slides in the underside.

The navigation part shows all the nine states of star’s life time. If click the icon of one state, the main windows show the information of this state and the slides show the condition (special combination) to reach the state. If the users want to know some information or the condition (the right combination) of this state, they can go directly to the

description of this state by clicking the state icon.

The group of slides is very important part in our program. There are 7 different slides, “Temperature”, “Speed”, “Distance”, “Fuel”, “Size”, “Fuse” and “Gravity”. User can manipulate them. If they are in special combination, the main window shows the state related to this combination. In other condition, the main window shows “Please try another combination”.

Possible Functional Extensions

As we consider, this program can be more developed in future. There are some points for functional extension. First, more easily understand function and more instruction at the same time with playing the game. Second, add some voice information or some music while use it. This will make the game more interesting.

DISCUSSION AND CONCLUSIONS

In all, we consider a lot of usability in our design. Some guidelines are very useful. Certainly, we can do more to make the program worked better. There is no doubt that our program is suitable for children to play and learn at the same time.

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