

科学館の大型映像メディアにおけるアニメーションの活用 Use of animation in a large-scale image media of the science pavilion

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Abstract: In the science museum, the IMAX theater and the planetarium are often used to utilize the image media effectively. The main current of the large-scale image program is a program of the documentary style that treats grand nature of high presence and immersive sensation. However, the number of large-scale image works that treat various the worlds and themes such as the human body, the building, vehicles, and Science fiction by a computer graphics image work and the CG use for the reality is increasing because of the evolution of recent computer technology. In National Museum of Emerging Science and Innovation (MIRAikan), a high presence media are paid to attention as one of the techniques for promoting the science communications activity that is the mission. And, MIRAikan develops the large-scale image program to spread the scientific communication to the regional science pavilion. The program uses a typical animation technique of Japan named 2D animation of the cell picture paid attention to in the world. To infiltrate the family layer that is the core target of the regional science pavilion widely, it is thought that the power of expression of animation can be used.

Keywords: High presence sensation media, Super High Definition Image, Planetarium, IMAX theater, Science Communication, cave, Science Education,

1. Introduction

The image media that use the large-scale dome or the large screen have been often used in the exposition to represent the high realistic sensation. Moreover, the IMAX theaters and the planetariums are often equipped in the current science museum to represent the high quality of presence in the display environment. However, some of these theaters have been closed because of the financial problems such as the number of visitors and the expenditure. Though the high presence media are paid attention in the exposition, the exhibition, and the occasional event, it is not easy to spread them widely due to the large scale of the system compared with other image media. However, if the IMAX theater and the planetarium in the science museums were used as a tool that promotes the activity of science communications by utilizing the characteristics of the device effectively, the further use and development of the high presence media would be expected.

The large-scale image program will be thought as a tool that infiltrates the message of "New wisdom" that enriches the future and spreads it widely in MIRAikan. MIRAikan paid attention to popular animation inside and outside the country to achieve the purpose, did the large-scale image program especially, and the program-making that valued the appeal power to the family layer that was the core target in the spread was done.



Fig 1: Miraikan dome theatre and dome image

2. Use of animation

2.1 large-scale plane screen



Fig2: Large-scale screen program screening



Fig3: Large-scale screen projection system

Popular animation among the family was used to spread it widely when the large-scale image program to aim at the science instruction for the family was produced. The theme of speed at which the feature of a large-scale image can be made the best use of for the theme is chosen, and it produces in the outlook on the

world that matches to animation popular for the family (Figure 2). As for the screening evaluation result in a large-scale, plane screen, enjoyment and learning were shown to the high reputation value in Figure 4. A large-scale image media design learning using the scene and the high presence sensation with power from this as a hypothesis, a high amusement by the animation expression promotes the spread for the family, and a high education effect can infiltrate the theme on the science communications. Moreover, it is thought that the possibility that animation can contribute from the data that was able to be enjoyed to the charm-making as the program for the family is high though awareness is a little less than ten years old. Moreover, it is a result that learning is also high by high the enjoyment of Figure 4. It can be thought that this is a result of happiness's by the animation expression becoming basic in the basic design phase, and making "Process of learning" function enough.

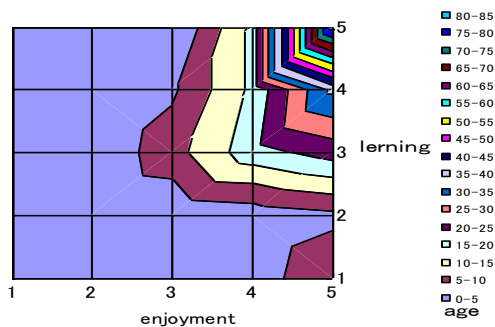


Fig 4 Large-scale image program screening result

2.2 Dome theater program

2.2.1 theme

It is important for each person to obtain "New wisdom" from the advanced science to live wisely and consider the future society. MIRAIKAN develops the technique for aiming at the achievement of an effective scientific communication, and always researches a new form of activity in the floor space exhibition, the image exhibition, and the form of activity such as information sending through various media.

MIRAIKAN took up "Carbon cycle" in the solution of the problem concerning the global environment as "New wisdom" that was able to be peeled off, and developed the permanent exhibit in recent years. We thought whether the aspect of the circulation that was not able to be experienced in the permanent exhibit was able to be infiltrated widely by the high presence sensation that was the feature of a large-scale image. And, we developed the large-scale image work to learn the carbon cycle.



Fig5: Carbon cycle

2.2.2 Design of learning

Tell the purpose the chance to actually feel that importance and those who see it about the aspect "Circulation" that is an essential theme to think about global environmental concerns are parts of the circulation and to watch the relation between the earth and me again by using the image experience with a presence with a dome.

And, the expression of the program aims to pass on the message by not understanding by the explanation as the acceptance to a wide layer around the family but a more intuitive image experience.

2.2.3 Visual design

①16:9 format selection

An existing production process can be used by the usual animation format. The quality is steady.

②Dome optimization measures of 16:9 formats

- To become a natural horizon line when the dome is projected, the distortion is corrected.
- The shading off mask processing is given to the boundary with the unprojection area.
- The unprojection area is colored to the image area and the similar color.
- It is designing that becomes the background of the image area as for the unprojection area. (The sky, forest, and the entire overhead view, etc.)

③Role of animation and dome CG

Animation is the world that becomes the character and the background. Dome CG is an aspect of micro in a grand scene and the inside of the body such as space and the earth, and global aspects that look at the earth.



Fig 6: Animation image(16:9)

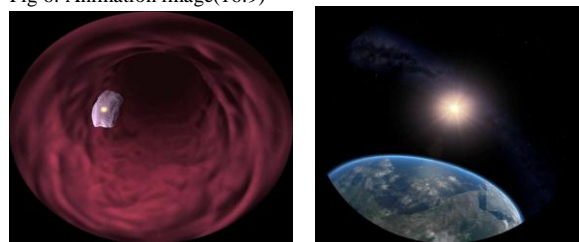


Fig7: Dome image (L:inside of the body R:the earth)



Fig8:Sample of making dome

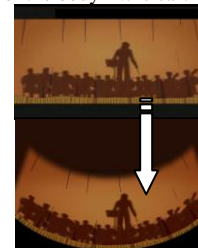


Fig9: Sample of making dome

3. Conclusions

The following two indicators are thought in using animation by the large-scale image program though it is a hypothesis.

- 1, The use of animation is a turn that both enjoyments and learning reach the high reputation value. It is effective in the class-making.
- 2, In the dome program, both goodness is constructed with the construction of the high presence sensation of dome CG, the character by animation, and the world.