

SPACE SYSTEMS SYMPOSIUM (D1)  
Poster Session (P)

Author: Dr. Dongzhe Wang  
Harbin Institute of Technology, China

Prof. Xibin Cao  
China

Dr. Gang Zhang  
Harbin Institute of Technology, China

THE MULTICHANNEL VISUALIZATION SPACECRAFT SIMULATION AND DEMONSTRATION  
SYSTEM BASED ON OSG ENGINE**Abstract**

For the spacecraft multimedia display and simulation, the problem of getting a high immersive experience way to help research and teaching continues to be interested. There are two main methods for the problem, one is based on the solidified splicing screen, which needs higher equipment parameters; the other uses a single large size screen, which needs more money. Based on the large widescreen projection, this paper investigates the design method for the high-brightness and high-resolution demonstration system by using the edge fusion technology and the multi-projector superposition technology. The surround speakers are installed around the outside of this system. The system adopts the non-commercial projector with a low price and the general projection screen to find an ideal equilibrium between price and performance. Compared with other design methods, the proposed method achieves the expected effect by reducing the price several times. Moreover, this system can be widely used in many fields, e.g., the commercial projection and the film entertainment.

This paper studies the edge fusion algorithm, the multi-projector superposition technology and the development of simulation system by Open Scene Graph engine. It has also been discussed in the Visual C++ field, the 3DMAX field. This development technology needs many kinds of disciplines, including the spacecraft design, the navigation and guidance, and the computer graphics, and so on. It can realize the interactive teaching of aerospace science and technology, and provides a visual display of the satellite dynamics to the audience so that it is easier to understand and master. The entire graphics system is a software interface based on the industrial standard OpenGL. It helps the programmers to create the high-performance, cross-platform interactive graphics program quickly and easily. The scene graphic is a middleware; the development software is built at the bottom of the API function, which provides the required spatial data organization ability and other characteristics for the high performance 3D program.

The physical verification installation for this system is located in the aerospace museum, Harbin Institute of Technology. In actual applications, by using the multimedia video, the science and education video in the aerospace museum, the interactive simulation of satellite launch and return, and the high immersive screen images and high fidelity audio, the system can bring a huge video shock for audiences. As an improvement from the old simulation and demonstration system, the proposed system in this paper brings more intuitive and plentiful experiences for users.