The Analysis on the Key Technology of Computer Graphic Image Processing

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Abstract: Since producing in the late 1980s, computer graphics and graphic image processing technology have played an indispensable role in many aspects of social and scientific development. While bringing people various conveniences in life, study and work, it also brings people more intuitive visual cognition. In the paper, it simply introduces the main content of graphics, the composition and function of graphics system. Finally, the key technologies are analyzed and studied.

1. Introduction

Computer graphics image processing technology uses the computer to make the graphic image design, adjustment and beautification. As an emerging industry, the technology has a promising future. Computer graphics image processing involves graphics interactive technology, natural simulation, virtual reality and other aspects and so on. Its main purpose is restoring the realistic graphics image with the help of computer aided function. It includes many applications software such as the CAD and CAE. In addition, to increase the extensive promotion of computer graphics image processing technology, it can bring great convenience for people's daily study, work and life on the one hand. On the other hand, it can promote its related industries to develop more orderly. Therefore, it has a great practical significance to study the key technologies of computer graphics image processing.

2. The Main Content of the Computer Graphics

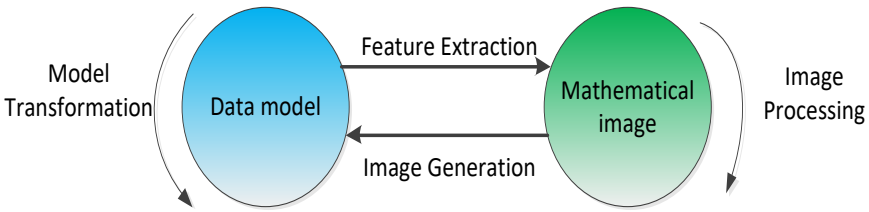

Fig.1 The schematic diagram of the relationship and transformation between computer graphics and image technology

Computer graphics includes the graphic image visualization research, the graphic standardization research, the graphic modeling research and the image interaction research etc.. For the study of computer graphics, it is mainly through the means of the corresponding computer mode to present a third dimension of the graphic images. In the process of studying the computer graphics, some necessary geometric design theories should be used. The calculation method and related principle are the most important content in the research of computer graphics that how to show the graphics through computer, and calculate and process the related graphics by computer and then to show the result. The computer graphics images are usually composed of different geometric elements such as volume, plane, line and point, as well as several different non-geometric attributes such as line width, line shape, color and grayscale. In the geometric design, the computer aided function is inseparable from computer graphics. In the practical operation, computer graphics can also take the relevant technical operation of solid and curve and surface constructing modeling as the main

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research object. At the same time, using digital image to provide the relatively real computing results of the computer graphics, it is inseparable between the relationship and graphics for the computer graphics image processing technology. Figure 1 is the schematic diagram of the connection and transformation between computer graphics and image technology.

3. The Composition and Function of the Computer Graphics System

3.1 The Composition of the Computer Graphics System.

Computer hardware and its related processing software constitute the computer graphics system together. Hardware device has the processor devices, graphics input devices and graphics output devices etc. Among them, the processor plays a very important role in the system, which is the interconnection hub of the computer and graphics terminal equipment. On the one hand, it can process and store relevant data information of the graphic and image. On the other hand, it can carry out operation on geometric functions of graphics, which will further promote the computer graphics system to have more powerful graphic display function and more efficient image presentation rate. Its main input devices are the keyboard and mouse. Through the operation by the keyboard and mouse, it can perform a variety of graphics drawing commands. For example, in the CAD design software, these are the most critical input devices. With the development of science and technology, the space ball, data gloves, light pen and touch screen and other hardware devices have been invented. The output equipment mainly includes display system, drawing system, etc. Among them, the display system is mainly used to quickly generate and process graphics, while the drawing system is mainly used to permanently save graphics, such as the display, plotter and printer and so on. With the continuous development of hardware equipment, the computer graphics system has launched a variety of applications that can be used for graphics processing, it makes the computer graphics system functions become more perfect. Photorealistic graphics refer to the final digital results which are displayed. There is an inevitable connection between computer graphics and image modification, which has inseparable dependence and universal publicity. In practice, the combination of the two techniques can make the visual effect of the picture be more clearer. The differences between graphics and image processing are mainly reflected in data sources, processing methods, application and the theoretical basis, etc. Their data sources are derived from the objective world and the subjective world. Image processing methods involve geometric correction, image enhancement, image transformation, etc. Graphic processing methods include geometric transformation, hidden surface elimination, curve fitting and surface fitting and so on. Finally, image processing is based on the theories of probability, statistics and digital signal processing, while graphic processing is based on the theories of radioactive transformation, computational geometry and perspective transformation, etc[1].

3.2 The Function of the Computer Graphics System.

The functions of computer graphics system include calculation function, information storage function, information input function, information output function and dialogue function, etc. The calculation function can analyze and summarize the relevant operations in the graphic design and processing to ensure the accuracy of drawing, such as the transformation or the element synthesis for the graphic coordinates. Then the information storage function can realize the input of many data parameters and instructions, and then give the output graphic information through the output devices. For the information storage function, it can achieve the storage of graphic data information, and it can also achieve the retrieval and maintenance of the relevant data information. Finally, it can realize the the function of man-machine switching by using the dialog function to complete the computer operation in the information of the display device or the man-machine exchange device [2,3].

4. The Key Technology of Computer Graphics Image Processing

4.1 The Basic Concept of Graphic Image Processing Technology.

The graphic image processing technology mainly uses the computer technology to carry on the reasonable modification, transformation, storage and perfect in the geometry data and the geometry model of the mathematics description. It includes geometric transformation, image digitization, modeling design, the elimination of the hidden line and hidden surface and a variety of color design. These technologies need to be equipped with professional auxiliary computer software, such as the CAD design software, the CAM manufacturing software and the CAJ auxiliary education software, etc. At the same time, in the application of graphic image processing technology, computer art design, simulation, animation and other technologies will be used. The paper mainly introduces two key processing technology that they are CAD technology and digital technology[4].

4.2 CAD Technology.

The application of CAD technology mainly relies on the CAD software, which is developed by using image processing equipment. It is now widely used in the products design in enterprise to complete information calculation, storage and image rendering and so on. In the process of computer image processing by using CAD technology, for the corresponding design scheme, it is necessary to pay attention to on making the targeted processing, it can help select the most optimal design scheme. Using the software functions to optimize the processing and retrieval of the graphic and text information can make the graphic text editing and mobile processing be better achieve. In many industries and fields of today's society, CAD technology has a very important application, including surface modeling technology and interactive technology. Among them, the interactive technology is mainly use the graphic output and display equipment to achieve graphics rotation, perspective and translation and other related design editing in the coordinate system built by user, so that it can make the graphics transformation be easier to achieve. In addition, interactive technology can intelligently realize human-computer interaction, which is convenient for designers to deal with virtual proofing, data correction and other work, and it can obtain the corresponding results in a relatively short time, which is greatly improving the work efficiency.

4.3 The Digital Technology.

Since the computer graphics image technology is formed on the basis of morphological mathematics technology and solid geometry technology, it is necessary to digitize the images and graphics when processing some images and graphics, and then it should be further converted them into the recognized format by the computer. The specific implementation steps of digitization are as follows. First, the sampling. Secondly, the segmentation which mainly involves the segmentation of images in both horizontal and vertical directions. Thirdly, it is to quantify the obtained data points. Finally, code and compress. In the computer image storage process, the last step is particularly important. At present, a wide range of coding compression methods which are used in practical applications mainly include the transform coding, prediction coding and wave point change compression coding and so on[5].

5. Conclusion

In the paper, it simply introduces the main content of computer graphics and its composition and function. And considering the computer graphics image processing technology has important application in the more and more field and industry, we should study the related key technologies and have a deep understanding and grasp in order to be able to get more ideal result, and we should fully grasp the specific application of this technology. At last, the key technologies of CAD and digitization are studied in this paper. It is hoped that in the future practical production and design, the computer image processing technology can be better applied to obtain more ideal results.

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