

Application and Analysis of Image Processing Technology in Modernization

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Abstract

With the development of computer, image processing technology is widely used in various fields of modernization, such as transportation, media, culture, industry and so on, which has greatly improved people's living standards. Therefore, based on the current situation and development of computer image processing technology, this paper studies the application of image processing technology in modernization, so as to provide guarantee for the development of modernization.

Keywords

Image processing technology; Computer; Modernization.

1. Introduction

In the late 20th century, with the rapid development of computer, a variety of image processing technologies continue to appear. Many software, based on image processing technology, provide services for data analysis and acquisition of various images in all walks of life, and gradually become mature. Computer image processing technology operates according to relevant programs, such as extracting images, segmenting images, enhancing images, etc. it can also process the pixels of its images to achieve the application objectives of operators in various industries. This kind of technology involves engineering, military, cultural and agricultural fields [1].

2. Introduction to Image Processing

Image processing is a technology that uses a computer to analyze images to achieve the desired results. Also known as image processing. Image processing generally refers to digital image processing. Digital image refers to a large two-dimensional array captured by industrial cameras, cameras, scanners and other equipment. The elements of the array are called pixels, and its value is called gray value. Image processing technology generally includes three parts: image compression, enhancement and restoration, matching, description and recognition.

Image processing technology can help people understand the world more objectively and accurately. Human visual system can help people obtain more than 3 / 4 of the information from the outside world, and images and graphics are the carrier of all visual information. Although human eyes have high discrimination and can recognize thousands of colors, in many cases, images are blurred or even invisible to human eyes, Through image enhancement technology, blurred or even invisible images can become clear and bright.

3. Common Methods of Image Processing Technology

3.1. Image Transformation

Because the image array is very large, it is processed directly in the spatial domain, which involves a lot of computation. Therefore, various image transformation methods, such as Fourier transform, Walsh transform, discrete cosine transform and other indirect processing technologies, are often used to convert the processing in spatial domain into processing in transform domain, which can not only reduce the amount of calculation, At present, the emerging wavelet transform has good localization characteristics in both time domain and frequency domain, and it also has a wide and effective application in image processing.

3.2. Image Coding and Compression

Image coding and compression technology can reduce the amount of data describing the image (i.e. number of bits) in order to save image transmission and processing time and reduce the occupied memory capacity. Compression can be obtained without distortion or under allowable distortion conditions. Coding is the most important method in compression technology, which is the earliest and mature technology in image processing technology [2].

3.3. Image Segmentation

Image segmentation is one of the key technologies in digital image processing. Image segmentation is to extract the meaningful features in the image. The meaningful features include edges and regions in the image, which is the basis for further image recognition, analysis and understanding. Although many methods of edge extraction and region segmentation have been studied, there is no effective method generally applicable to all kinds of images. Therefore, the research on image segmentation is still in-depth, and it is one of the hotspots in image processing.

3.4. Image Enhancement and Restoration

The purpose of image enhancement and restoration is to improve the quality of the image, such as removing noise and improving the definition of the image. Image enhancement does not consider the reasons of image degradation, and highlights the parts of interest in the image. If the high-frequency component of the image is enhanced, the outline of the object in the image can be clear and the details can be obvious; If the low-frequency component is enhanced, the influence of noise in the image can be reduced. Image restoration requires a certain understanding of the causes of image degradation. Generally speaking, a "degradation model" should be established according to the degradation process, and then some filtering method should be used to restore or reconstruct the original image.

3.5. Image Description

Image description is a necessary prerequisite for image recognition and understanding. As the simplest binary image, its geometric characteristics can be used to describe the characteristics of objects. The general image description method adopts two-dimensional shape description, which includes boundary description and region description. For special texture images, two-dimensional texture features can be used. With the in-depth development of image processing research, three-dimensional object description has been carried out, and methods such as volume description, surface description and generalized cylinder description have been proposed.

4. Application of Image Processing Technology in Modern City

4.1. Image Description

Computer image technology is also widely used in the field of remote sensing satellites. For example, according to relevant data, Landsat series and Skylab resource remote sensing satellites were launched in the late 1960s. Due to environmental factors, the image quality returned by the satellite is low, so it is difficult to obtain useful information from the image. With the gradual application of computer image processing technology in this field, remote sensing satellites digitize and encode the collected original image in the air, convert it into digital signal and transmit it to the processing center. Through computer image processing, the image is compressed and encoded, image enhancement, image restoration, image segmentation and image recognition, Finally, effective and clear information is obtained from the returned image. In addition, the application of computer image technology in remote sensing satellites has played an important role in resource exploration, meteorological observation and topographic exploration. For example, in railway construction design, remote sensing satellites can be used to obtain the image of the target area, interpret the image after image processing, and carry out railway design more accurately according to the obtained high-quality image, It further improves the efficiency and safety of railway construction.

4.2. Agricultural Field

The rational application of computer image processing technology in the field of agriculture is reflected in the following points: when selecting crop seeds, the root of crops comes from seeds. It is necessary to detect the seed quality to ensure the survival rate of crops and the improvement of subsequent management effect, so as to provide guarantee for the realization of high-quality production of crops. Image processing technology is used in the planting stage of crops, which can detect the timeliness of sowing operation in production, so as to avoid staff sowing and consume a lot of time and energy; By using the crop picking facilities, the image processing technology is defaulted to the red program. All fruits need to be harvested by using the picking facilities and identify the quality level of fruits, which saves time and effort, so as to create greater economic benefits. Computer image processing technology is used to clearly identify whether there are diseases and pests in fruits, so as to maximize the reduction of operation time and cost.

4.3. Medical Field

The application of computer image processing technology [3] in the image visualization technology in the hospital field can help clinicians make a clear diagnosis through the construction of three-dimensional models of human invisible organs. In the process of treating malignant tumors, it can help clinicians formulate surgical plans in advance, so as to reasonably grasp the shape and spatial position of lesions. In the radiotherapy process for patients with malignant tumors, it can prevent key tissues around tumors from being exposed to radiation and avoid damage to normal tissues. Use the data connection part to reasonably connect the Internet and clinical medical images, so as to ensure the remote transmission of medical images and meet the relevant requirements of remote treatment, so as to improve the efficiency of medical image information management and control.

5. Modern Development Trend of Image Processing Technology

From the perspective of modernization, image processing technology is developed based on computer. Therefore, with the rapid development of artificial intelligence and computer, image processing can be applied and popularized in various industries. However, with the continuous improvement of people's living standards, in order to follow the development of society,

computer image processing technology should also be constantly updated, and can not stay at the current technical level. Therefore, only by continuously improving their knowledge and professional skills and following the progress of the times, can relevant researchers explore the advanced image processing technology. Whether it is people's development requirements or the development trend of artificial intelligence, it will show relatively high definition in people's vision, and there will be a great breakthrough in the field of image technology, which improves people's demand for various products and convenience. In terms of image processing algorithms, some industries need to improve the technology and algorithm performance to facilitate the optimization of unreasonable problems [4].

6. Conclusion

From the above analysis, it can be seen that in the current modernization, computer image processing is applied in various fields, such as medicine, transportation, military and engineering. With the development of 5g technology, it has brought great convenience to people's life. Therefore, image processing technology is of great significance for the development of modernization.

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