Computer Image Recognition Technology and Application Analysis

Nan Yang1,*, Zhiyi Wang2, Shihao Wang3
1Data Science And Technology, North University of China, Taiyuan, Shanxi, 030051
2The School of Middle East Studies, Beijing Language and Culture University, Beijing, 100083
3School of Computer Science and Engineering, Central South University, Changsha, Hunan, 410083
*Corresponding author e-mail: yangnan@nuc.edu.cn

Abstract. In recent years, with the continuous development of science and technology, the application range of computer image processing and recognition technology, which improves image quality and plays an important role in practical application, has been gradually expanding. Based on this fact, this article first introduces computer image processing and recognition technology and analyzes its application advantages and characteristics, then analyzes and introduces its application principles and application process, and finally discusses its practical application. It can provide some help to related technicians to promote the application and innovation of computer image processing and recognition technology.

Keywords: Computer image processing and recognition technology, Principle, advantages and characteristics, application.

1. Introduction
As an advanced science and technology, computer image processing and recognition technology is mostly applied to the processing of computer information data. It has the advantages of fast processing speed, high accuracy, and good flexibility, which can improve computer information data processing and recognition work efficiency. After years of research and application development, computer image processing and recognition technology has now been applied in many fields, such as intelligent transportation, non-ferrous metal manufacturing, medical treatment, criminal investigation and other fields, and achieved good application results.

2. Computer image processing and recognition technology
Computer image processing and recognition technology is a scientific technology that replaces human eyes with computer systems. Its working principle is similar to manual image recognition. It automatically extracts key points in image information and compares and analyzes with the set processing and recognition rules. It can repair defects in the image to meet people's aesthetic needs, and at the same time play a role in image quality detection[1]. Computer image processing and recognition technology can process and recognize image information according to people's wishes. It
is widely used in fields such as intelligent transportation, non-ferrous metals, medical treatment, etc. It is closely related to the development and progress of modern society and is the current stage of research and development. As one of the main technologies of the company, it has good prospects for future applications.

3. Application advantages and characteristics of computer image processing and recognition technology

(1) Fast processing speed

From the perspective of the development and application of computer image processing and recognition technology, it plays an important role in many fields and has great application advantages among which fast processing speed is one of the main advantages. Especially after the popularization and application of the Internet, people can access a large amount of data and information of which the content is complicated. Traditional processing and recognition technology has been incompetent to meet normal work requirements\(^2\). Computer image processing and recognition technology to process data information can improve the efficiency of data processing and recognition, and complete the analysis and processing of data information in a short period of time, providing users with good applicability and coordination.

(2) High accuracy

In a specific application process, computer image processing and recognition technology can process and recognize images of different types at the same time, and can efficiently and accurately filter out effective and complete image information from the massive image data resources. Compared with traditional artificial image processing and recognition methods, computer image processing and recognition technology has higher application accuracy. However, computer image processing and recognition technology lacks intuitive experience in the actual application process and information feedback ability of artificial image recognition. There is a certain degree of non-subjectivity in image processing and recognition, which affects the recognition result, so two joint image processing and recognition technologies are applied to improve the overall application effect.

(3) Good flexibility

Computer image processing and recognition technology can use intelligent settings for image processing during application. Technicians can adjust the accuracy of computer image processing and recognition technology application to achieve image automatic processing and recognition functions. The technical application is flexible and applicable in different working environments and scenarios, the same application effect can be exerted\(^3\). At the same time, the application of computer image processing and recognition technology can reduce the intensity of manual operations, improve the efficiency of image information processing, and increase the amount of processing, making the work of technicians more flexible and improving the practicability and accuracy of image processing.

4. Principles and application process of computer image processing and recognition technology

(1) Application principle

The application principle of computer image processing and recognition technology is similar to the image perception function of the human eye. The application of computer image processing and recognition technology requires the use of a computer to convert the target image into a specific digital signal, and use a relevant calculation formula to process the conversion result to obtain the data information that people need. In this process, the computer can recognize the shape, color, size, etc. of the image, form a fixed memory which is stored in the computer image library\(^4\). When the computer encounters an image of a similar objective thing again, it will use the computer's processing and recognition functions to capture the feature points of the new image, and compare it with the specific image stored in the database one by one to find the closest image information and complete image processing and recognition operations. Compared with manual image processing and recognition, the application of computer image processing and recognition technology is more objective, accurate and efficient, but the generated images lack subjective description.
(2) Application process

The application of computer image processing and recognition technology mainly involves four processes: image acquisition, preprocessing, feature point capture and image information classification. Firstly, the computer will obtain image information through various sensors and convert it into specific digital signals for computer system applications\(^5\). Secondly, after the computer acquires the relevant image information, it will preprocess it immediately, extract valuable information from the image, analyze it and store it, and directly send it to the image recognition module for recognition. The function of this operation is to effectively remove parts of the image information that are valueless and meaningless, streamline the image information, and improve the value and efficiency of subsequent operations. Thirdly, the computer will set up a specific program according to the actual needs of the operator, identify the image features that meet the requirements, find all the image information with the target features, and get the recognition result. Finally, a recognition rule is set, so images consistent with the target image characteristics can be accurately found in the massive images, then the entire operation process is completed.

5. Practical application of computer image processing and recognition technology

(1) Applied in the field of intelligent transportation

Nowadays, with the improvement of people's living standards, driving by car has become the mainstream mode of transportation. The big surge in vehicles is causing traffic congestion and more frequent vehicle accidents. In order to improve the management efficiency and quality of urban traffic, computer image processing and recognition technology has been well applied in the field of intelligent transportation. It has played a significant role in driving assistance, vehicle positioning, and intelligent calibration. The application characteristic of image processing and recognition technology is fast and accurate processing and recognition of image information. For example, by applying computer image processing and recognition technology to vehicle assisted driving, it can be used to recognize road traffic information in real time, thereby effectively control the occurrence of lane-shifting problems. When lane-shifting problems come up, the system will sound an automatic alarm to warn the driver of the vehicle so that he can notice driving problems and adjust the vehicle's position and driving route in time to ensure his safety. Besides, computer image processing and recognition technology can also accurately identify the vehicle information on the road, which is helpful for tracking the driving route of the vehicle and driver of hit-and-run vehicles.

(2) Applied in the medical field

With the continuous development of medical technology, more and more advanced science and technology are applied in the field of medical care, and a large amount of complex data information will be generated, which can use computer image processing and recognition technology to operate and improve medical treatment work effectiveness. Because there are many types of images produced in medical treatment of which the content is complex, it is necessary to classify them before processing, and then perform targeted processing and recognition, which can effectively improve the effect of image processing and recognition. For example, when processing cell chromosome image information, it is necessary to classify images according to certain rules, and then use computer image processing and recognition technology to process and recognize its feature points, and compare the information in the image database, which will efficiently and accurately identify cell chromosomes, provide medical staff with accurate and complete data support, and improve diagnosis and treatment efficiency. In addition, computer image processing and recognition technology can also be used in the analysis of endoscopic or MRI images to model patients in 2D or 3D, analyze anatomical images, and make the image information obtained by medical staff more vivid, accurate, and helpful for implementation of precise treatment.

(3) Applied in non-ferrous metal manufacturing

As one of the most widely used metal materials in the industrial field, non-ferrous metals have many types and are ubiquitous in people's lives and work. They are indispensable metal products. Take metallic copper as an example. Copper is one of the most commonly used metals in the field of
non-ferrous metal manufacturing which mostly exists in the form of copper ore in nature so the identification is difficult. When using computer image processing and identification technology for copper ore detection, with the help of a variety of modern testing equipment and instruments, physical and chemical joint detection and identification methods can input the X-ray fluorescence spectrum data of copper ore into the computer system and accurately extract the characteristic points of copper ore, summarize and analyze relevant data information of copper ore. In this way, copper ore can be accurately identified and detected by means of information data curve comparison, which improves the efficiency and accuracy of copper ore detection, saves detection time, and makes the detection process simpler and more flexible.

(4) Applied in the field of public security reconnaissance

At present, computer image processing and recognition technology is widely used in the field of public security investigation, and the application effect is good. It provides excellent conditions and technical support for public security investigation work, greatly shortens the time of case investigation, and improves the speed of case handling. The application of computer image processing and recognition technology in the field of public security investigation is mainly human image recognition. In the process of tracing criminal suspects, computer image processing and recognition technology can be used to find the case and quickly obtain the identity information of the criminal suspect. It is of great significance to solve the case[6]. At the same time, in the field of public security investigations, computer image processing and recognition technology can also be used to process and optimize complex images or distorted images to obtain more accurate and clearer images, and provide effective image support for case detection.

6. Conclusion

In short, the application range of computer image processing and recognition technology is very wide, and it plays a great role and has an important influence on the development of modernization. Therefore, we must start with the application principles and characteristics of computer image processing and recognition technology, continuously optimize technology applications, increase technology application functions, promote its further application development, improve technology application efficiency and quality, and enable it to be used in more fields to promote the rapid development of society. Computer intelligent image recognition technology is based on computer technology, intelligent technology and processing recognition technology. It can convert the input image information into corresponding computer models, and perform corresponding classification and matching process on it so as to draw people to the desired result. Through computer intelligent image recognition technology, we can realize the rapid recognition of selected objects, obtain target information from them, and then make correct decisions.

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