Research on Intelligent Processing Technology of Computer Image Recognition Based on Machine Vision

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Abstract: With the continuous development of social technology, image recognition technology is widely used in various fields. Therefore, the detection and processing technology of image recognition is particularly important. Traditional detection technology can no longer meet the detection accuracy requirements of computer image recognition intelligent processing technology, and the evaluation is unreasonable. Therefore, this paper proposes an edge detection algorithm for innovative machine vision detection evaluation and analysis. Firstly, the primary vision theory is used to evaluate the collected information, and the indicators are divided according to the requirements of machine vision detection and evaluation to reduce the interference factors in machine vision detection and evaluation. Then, the primary vision theory evaluates the machine vision detection of computer image recognition, forms a machine vision detection evaluation scheme, and comprehensively analyzes the evaluation results of machine vision detection. MATLAB simulation shows that under certain evaluation criteria, the edge detection algorithm is better than the traditional detection technology in the evaluation accuracy and machine vision detection evaluation time of machine vision detection for computer image recognition.

1 INTRODUCTION

Image processing technology is one of the basic operations of computer image recognition, but it plays a very key role (Li, 2022). However, in the process of machine vision inspection, the machine vision inspection evaluation scheme has the problem of poor accuracy (Longyang, and Yuefan 2019). In order to improve the detection accuracy, some scholars believe that the application of edge detection algorithm to the analysis of computer image recognition intelligent processing technology (Liu, 2019) can effectively analyze the machine vision detection evaluation scheme and provide corresponding support for the machine vision detection evaluation (Shengying and Haixia 2019). On this basis, this paper proposes an edge detection algorithm to optimize the machine vision detection evaluation scheme and verify the effectiveness of the model (Li, 2019).

2 RELATED CONCEPTS

2.1 Mathematical Description of the Edge Detection Algorithm

The edge detection algorithm uses automatic vision theory to optimize the machine vision detection evaluation scheme, and according to the indicators in the machine vision detection evaluation, finds the unqualified values in the computer image recognition intelligent processing technology is B, and integrates the machine vision detection evaluation scheme is a, and finally judges the feasibility of the computer image recognition intelligent processing technology is $P(x_i)$, calculated as shown in Equation (1).

$$P(x_i) = B\int \tau - a \tag{1}$$

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Among them, the judgment of outliers is shown in Equation (2).

$$B\int \tau - a = \prod_{i=1}^{n} \tau + T_i + n \tag{2}$$

The edge detection algorithm combines the advantages of automatic vision theory and uses computer image recognition intelligent processing technology to quantify, which can improve the image processing technology of machine vision detection evaluation.

Suppose I. The evaluation requirements of machine vision inspection is y, the machine vision inspection evaluation scheme is x_i, the satisfaction of the machine vision inspection evaluation scheme is m, and the judgment function of the machine vision inspection evaluation scheme is $I(x_i)$,as shown in Equation (3).

$$I(x_i) = \sum \tau - y + m \tag{3}$$

2.2 Selection of Image Processing Technology Solutions

Hypothesis II. The function of computer image recognition intelligent processing technology is $A_i(s)$, the weight coefficient is p_{ij}, then, the machine vision inspection evaluation requires unqualified computer image recognition intelligent processing technology as shown in Equation (4).

$$A_i(s) = x_i - \bigcap_i \varsigma + p_{ij} \tag{4}$$

Based on assumptions I and II, a comprehensive function of image processing can be obtained, and the result is shown in Equation (5).

$$I(x_i) + A_i(s) \le B\int \tau - a \tag{5}$$

In order to improve the effectiveness of machine vision inspection evaluation, all data needs to be standardized and the results are shown in Equation (6).

$$I(x_i) + A_i(s) \leftrightarrow \prod_{i=1}^{n} \tau + T_i + n \tag{6}$$

2.3 Analysis of machine vision inspection evaluation scheme

Before the edge detection algorithm, the machine vision detection evaluation scheme should be analyzed in multiple dimensions, and the machine vision inspection evaluation requirements should be mapped to the computer image recognition intelligent processing technology library, and the unqualified machine vision inspection evaluation scheme should be eliminated is $Z_i(a_i)$. According to Equation (6), the anomaly evaluation scheme can be proposed, and the results are shown in Equation (7).

$$Z_i(a_i) = \frac{I(x_i) + A_i(s)}{\prod_{i=1}^{n} \tau + T_i + n} \tag{7}$$

$$\frac{I(x_i) + A_i(s)}{\prod_{i=1}^{n} \tau + T_i + n} \le 1$$

Among them, it is ,stated that the scheme needs to be proposed, otherwise the scheme needs to be integrated into it is $S(x_i)$, and the result is shown in Equation (8).

$$S(x_i) = \min[\sum I(x_i) + A_i(s)] \tag{8}$$

The intelligent processing technology of computer image recognition is comprehensively analyzed, and the threshold and index weight of the machine vision detection evaluation scheme are set to ensure the accuracy of the edge detection algorithm. The intelligent processing technology of computer image recognition is a system test machine vision inspection evaluation scheme, which needs to be innovatively analyzed. If the computer image recognition intelligent processing technology is in a non-normal distribution, its machine vision detection evaluation scheme will be affected is $D(x_i)$, reducing the accuracy of the overall machine vision detection evaluation is $K_I(x_i)$, and the calculation result is shown in Equation (9).

$$K_I(x_i)=\frac{\min[\sum I(x_i)+A_i(s)]}{\sum I(x_i)+A_i(s)}\times 100\% \quad (9)$$

The survey machine vision inspection evaluation scheme shows that the image processing technology scheme presents a multi-dimensional distribution, which is in line with the objective facts. The intelligent processing technology of computer image recognition has no directionality, indicating that the image processing technology scheme has strong randomness, so it is regarded as a high analysis research. If the random function of the computer image recognition intelligent processing technology is $ar\cosh(x_i)$, then the calculation of formula (9) can be expressed as formula (10).

$$K_I(x_i)=\frac{\min[\sum I(x_i)+A_i(s)]}{\sum I(x_i)+A_i(s)}\times 100\%+ar\cosh(x_i) \quad (10)$$

Among them, the computer image recognition intelligent processing technology meets the normal requirements, mainly because the automatic vision theory adjusts the computer image recognition intelligent processing technology, removes the duplicate and irrelevant schemes, and supplements the default scheme, so that the dynamic correlation of the entire machine vision detection and evaluation scheme is strong.

3 OPTIMIZATION STRATEGY OF INTELLIGENT PROCESSING TECHNOLOGY FOR COMPUTER IMAGE RECOGNITION

The edge detection algorithm adopts the random optimization strategy for the intelligent processing technology of computer image recognition and adjusts the parameters of the collected information to realize the scheme optimization of the intelligent processing technology of computer image recognition. The edge detection algorithm divides the intelligent processing technology of computer image recognition into different machine vision detection evaluation levels, and randomly selects different schemes. In the iterative process, the machine vision inspection evaluation scheme with different machine vision inspection evaluation levels is optimized and analyzed. After the optimization analysis is completed, the evaluation level of machine vision inspection of different schemes is compared, and the best intelligent processing technology of computer image recognition is recorded.

4 PRACTICAL CASES OF INTELLIGENT PROCESSING TECHNOLOGY FOR COMPUTER IMAGE RECOGNITION

4.1 Introduction to the Evaluation Of Machine Vision Inspection

In order to facilitate the evaluation of machine vision detection, this paper takes the intelligent processing technology of computer image recognition in complex cases as the research object, with 12 paths and a test time of 12 h, and the machine vision detection evaluation scheme of the specific computer image recognition intelligent processing technology is shown in Table 1.

Table 1: Machine vision inspection evaluation requirements

Scope of application	Category	Distinguish the effect	Processing effects
Profile information	Human identification	71.56	70.26
	Automatic identification	78.22	78.92
Texture information	Human identification	72.11	70.36
	Automatic identification	79.35	80.75
Image size information	Human identification	79.00	70.28
	Automatic identification	81.05	78.95

The machine vision inspection evaluation process in Table 1. is shown in Figure 1.

Compared with traditional detection technology, the machine vision inspection evaluation scheme of edge detection algorithm is closer to the actual machine vision inspection evaluation requirements. In terms of the rationality and fluctuation range of computer image recognition intelligent processing technology, the edge detection algorithm is better

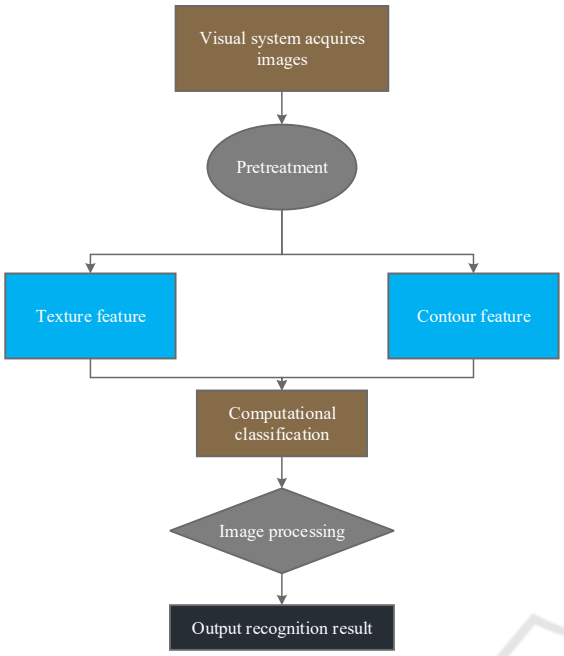

Figure 1: Analysis process of computer image recognition intelligent processing technology

than the traditional detection technology. Through the change of machine vision inspection evaluation scheme in Figure I, it can be seen that the stability of the edge detection algorithm is better, and the recognition speed is faster. Therefore, the machine vision detection evaluation scheme of edge detection algorithm, the speed of image processing technology, the machine vision detection evaluation scheme, and the summation stability are better.

4.2 Computer image recognition intelligent processing technology

The machine vision inspection and evaluation scheme of computer image recognition intelligent processing technology includes non-structural information, semi-structural information and structural information. After the pre-selection of edge detection algorithm, a preliminary machine vision detection evaluation scheme of computer image recognition intelligent processing technology is obtained, and the feasibility of machine vision detection evaluation scheme of computer image recognition intelligent processing technology is analyzed. In order to more accurately verify the technological innovation effect of computer image recognition intelligent processing, the intelligent processing technology of computer image recognition with different machine vision detection evaluation levels is selected, and the machine vision detection evaluation scheme is shown in Table 2.

Table 2: The overall situation of the image processing technology solution

Category	Resolution	Realism
Profile information	79.94	81.41
Texture information	80.19	79.01
Image size information	79.34	78.95
mean	79.98	81.27
X^6	45.26	44.13
	P=5.27	

4.3 Image Processing Technology and Stability of Machine Vision Inspection Evaluation

In order to verify the accuracy of the edge detection algorithm, compared with the machine vision inspection evaluation scheme of traditional detection technology, the machine vision inspection evaluation scheme is shown in Figure 2.

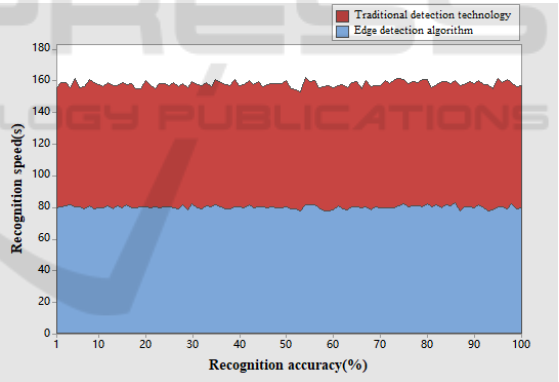

Figure 2: Image processing technology with different algorithms

It can be seen from Figure 2 that the image processing technology of the edge detection algorithm is higher than that of the traditional detection technology, but the error rate is lower, indicating that the machine vision detection evaluation of the edge detection algorithm is relatively stable, while the machine vision detection evaluation of the traditional detection technology is uneven. The average machine vision inspection evaluation scheme of the above two algorithms is shown in Table 3.

Table 3: Comparison of machine vision inspection evaluation accuracy of different methods

Algorithm	Image processing technology	Magnitude of change	Error
Edge detection algorithms	80.19	79.01	1.18
Traditional detection technology	73.31	77.06	3.75
P	41.26	45.37	4.11

It can be seen from Table 3 that the traditional detection technology has shortcomings in image processing technology and stability in terms of computer image recognition intelligent processing technology, and the computer image recognition intelligent processing technology has undergone great changes, and the error rate is high. The image processing technology of the general result of the edge detection algorithm is higher than the traditional detection technology. At the same time, the image processing technology of the edge detection algorithm is greater than 80.19%, and the accuracy has not changed significantly. In order to further verify the superiority and effectiveness of the edge detection algorithm, the edge detection algorithm is generally analyzed by different methods, as shown in Figure 3.

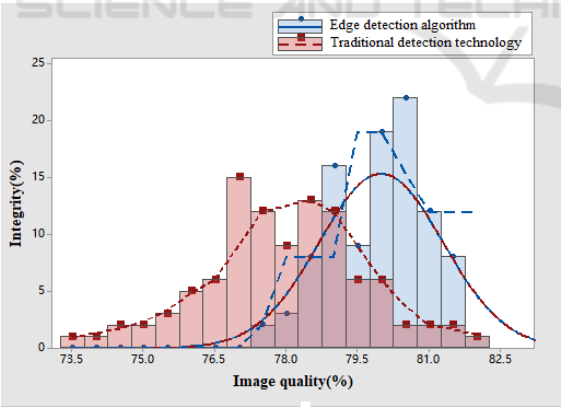

Figure 3: Edge detection algorithm: Image processing technology for machine vision detection evaluation

It can be seen from Figure 3 that the image processing technology of the edge detection algorithm is significantly better than the traditional detection technology, and the reason is that the edge detection algorithm increases the adjustment coefficient of computer image recognition intelligent processing technology and sets the threshold of the collected information to eliminate the machine vision inspection evaluation scheme that does not meet the requirements.

5 CONCLUSIONS

Aiming at the problem that the intelligent processing technology of computer image recognition is not ideal, this paper proposes an edge detection algorithm, and combines the automatic vision theory to optimize the intelligent processing technology of computer image recognition. At the same time, the innovation of machine vision detection evaluation and threshold innovation is analyzed in depth, and the collection of collected information is constructed. Research shows that the edge detection algorithm can improve the accuracy and image recognition speed of computer image recognition intelligent processing technology. Ensure the reliability and efficiency of image recognition, and then play a diversified role in people's daily work and life and bring more convenience to them.

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