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Research on Medical Image Diagnosis Method Based on Artificial Intelligence

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Abstract: *In order to solve the problems of large deviation between the diagnosis results of traditional diagnosis methods and the actual number of lesions, and the accuracy of image diagnosis, the research of medical image diagnosis method based on artificial intelligence was carried out. Through medical image preprocessing, image feature extraction and diagnosis based on artificial intelligence, a new diagnosis method is proposed. Experiments have proved that the new diagnosis method can achieve 100% accurate diagnosis of medical images, and provide reliable technical support for hospital medical services.*

Keywords: *Artificial Intelligence; Medicine; Imaging; Diagnosis; Methods;*

1. Introduction

Medical imaging diagnosis is a common disease diagnosis method in the field of medical services. In clinical practice, medical imaging diagnosis is usually combined with conventional disease examination methods, and doctors make judgments based on medical laws [1]. The current common medical imaging diagnostic method is a diagnostic method based on nuclear matching and tracking. This diagnostic method needs to be combined with the doctor's subjective judgment in practical applications, so it is very easy to be restricted by the doctor's cognitive ability. At the same time, a lot of data resources are wasted seriously. In the process of interpretation of medical image data, doctors will also have misdiagnosis or missed diagnosis with the increase of fatigue [2]. At present, there are many kinds of modern medical devices, and the data structure is more complex. Therefore, only relying on the subjective judgment of doctors will have a very adverse impact on the accuracy of medical imaging diagnosis. Based on this, in order to further improve the accuracy of diagnosis and protect the vital interests of patients, this article combines artificial intelligence technology to carry out research on medical imaging diagnosis methods.

2. Design of medical image diagnosis method based on Artificial Intelligence

2.1. Medical image preprocessing

Due to the influence of light conditions in the process of medical image acquisition, the image quality is uneven, which will also affect the follow-up diagnosis. Therefore, in order to reduce the interference of illumination and other external factors on the gray distribution of medical images, it is necessary to preprocess the medical images to realize the standardization of the gray distribution [3]. On this basis, combined with the application of histogram, Perform equalization processing. Considering that in this step, the image is known to have gray-scale distribution characteristics, so it is necessary to adopt a direct change method to uniformly process the gray-scale value in the image, so that a gray-scale distribution is relatively uniform. Medical imaging. The gray scale transformation can be expressed by the following formula:

$$s = T(r) \tag{1}$$

In formula (1), s represents the gray level of medical image after gray level transformation; r represents the gray level of the enhanced medical image. According to the above formula, the new probability distribution density of medical image gray level must ensure its normalized uniform distribution. In this case, the discrete situation of the transformed medical image can be expressed by the following formula:

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$$f(r)=\frac{n_k}{n} \tag{2}$$

In formula (2), $f(r)$ represents the discrete value of the medical image after transformation; n represents the total number of pixels in the medical image; n_k represents the pixel on the k-th grayscale of the medical image. In formula (2), the value of r is [0,1]. In this way, the gray scale transformation and discrete processing of medical images are realized through the above operations.

2.2. Image feature extraction and diagnosis based on Artificial Intelligence

Based on the traditional medical image diagnosis method based on kernel matching tracking, artificial intelligence technology is introduced to realize the learning of nuclear machine, so as to realize the feature extraction of the medical image which is preprocessed above. For the medical image which is preprocessed above, it is necessary to construct the symbiotic matrix of gray level continuously, and extract the image feature value in this way, ensure that the effective description of image distribution and image interval based on gray value is achieved, and use this as the basic information for medical imaging image analysis. Regarding the medical image as a curved surface in the three-dimensional space, using the results obtained by the above calculation, in the three-dimensional space, the joint distribution of two adjacent pixels is counted. For the texture feature quantity existing in the image, it is usually impossible to directly use the gray-level co-occurrence matrix to obtain it. Then the texture feature quantity is extracted. In the actual extraction process, the real part and imaginary part of the transformed image have strong similarity, so only the mean value of the molecular band in the upper half of the real part needs to be calculated to realize the feature extraction

$$mean=\frac{1}{N}\sum M_k \tag{3}$$

In formula (3), N represents the number of elements in each subband. Combining the nuclear machine learning technology, select an n×n sliding window, transform the elements in the window, and then use the above formula to extract the features of each element in the window. In order to ensure the accuracy of feature extraction, first select medical images with known features as training samples, and use nuclear machine learning to perform iterative training through the above operations [4].Generally, when the number of iterations is 50, the accuracy of feature extraction can reach the standard of accurate recognition of medical images.

According to the above operations, after completing the relevant processing of the method, the sample set is constructed according to the sampling distance of the image [5]. Separately classify each different identified sample set, and compare it with the unidentified samples to be diagnosed in different lesion images, and finally obtain the diagnosis results, so as to realize the diagnosis of medical images.

3. Experimental demonstration and analysis

This article chooses a hospital as the experimental environment for this article, and chooses the hospital's medical imaging of only half a year as the experimental object. In order to further verify the application advantages of the artificial intelligence-based medical imaging diagnosis method proposed in this article, I choose to compare it with the traditional A comparative experiment was carried out based on the diagnosis method of nuclear matching tracking. After obtaining the medical images from the hospital database, the medical images were preprocessed and processed 10 times clockwise °, twenty °, thirty °And counter clockwise 10 °, twenty °, thirty °Methods: some of the medical images were rotated randomly. A total of 1000 medical images were selected, of which 800 were normal images and 200 were pathological images. Two diagnostic methods were used to diagnose 1000 images to find out the medical images with lesions. The experimental results are plotted as shown in Table 1.

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Table 1 Comparison of experimental results of two diagnostic methods

Number of medical images	Actual number of lesion images	The results of diagnosis in this paper	Traditional method diagnosis result
200s	42s	42s	10s
200s	35s	35s	12s
200s	68s	68s	22s
200s	16s	16s	9s
200s	39s	39s	20s
Total:	200s	200s	73s

From the experimental results in Table 1, it can be concluded that the diagnosis method in this paper can accurately identify all the existing lesion images in 1000 medical images, and the recognition accuracy rate is as high as 100%. However, after the traditional diagnosis method completes the diagnosis of 1000 medical images, only It can realize the recognition of 73 lesion images. In the course of the experiment, it was discovered that due to the influence of the rotation processing of medical images, the traditional nuclear matching tracking method could not realize its effective recognition, resulting in extremely low diagnostic accuracy. Through the above experiments and results, it is further proved that the medical image diagnosis method based on artificial intelligence proposed in this paper can achieve 100% accurate diagnosis of medical images in practical application, and has a positive impact on the diagnosis effect of patients.

4. Conclusion

As a special kind of image, medical image itself is complex and indistinguishable. At the same time, the amount of data in medical image is very large. We must rely on a reasonable diagnosis method to get a good diagnosis effect. In this regard, based on the application advantages of artificial intelligence in various fields, this article proposes a brand-new medical imaging diagnosis method, and proves the practical application advantages of this method through experimental demonstration. Applying the diagnosis method proposed in this article to practice can assist doctors in giving more reasonable diagnosis results to patients. However, due to the limited research ability, this paper does not consider that different preprocessing methods are needed for medical images from different sources in the design of this diagnostic method. Therefore, the current method is only applicable to all kinds of common medical image acquisition equipment in hospitals. In the follow-up research, more in-depth research will be carried out to solve this problem, Thus, the practical range of this diagnosis method is further expanded.

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