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Reliability Enhancement Algorithm of Human Motion Recognition Based on Knowledge Graph

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ABSTRACT

In order to solve the problem of uneven spatial distribution of human motion image and low peak signal-to-noise ratio (PSNR) of image reliability enhancement, a reliability enhancement algorithm for human motion recognition based on knowledge graph is proposed. An automatic spatial planning model of human motion image is constructed. The human motion spatial features are sampled, and the three-dimensional contour feature reconstruction model is established. The human motion spatial contour structure is reconstructed by adaptive edge feature detection method, and the knowledge graph of the motion image is extracted. Multi-scale information enhancement method is used to enhance and recognize the reliability of human motion image. The experimental results show that the method has the advantages of good reliability, high signal-to-noise ratio of image enhancement, and high accuracy of human motion recognition.

KEYWORDS

Enhancement Algorithm, Human Motion Recognition, Knowledge Graph, Reliability

1. INTRODUCTION

When human motion feature recognition is performed in a computer three-dimensional visual space, a three-dimensional motion planning method is used to analyze the human motion characteristics, and a motion characteristic analysis model of the human motion is established. In this way, a spatial planning model of human motion can be realized, and feature sampling and information recognition of human motion images can be performed in a computer vision environment, thereby guiding the accuracy of human motion images and improving the ability to guide and correct human motion (Sun et al.,2019). The reliability of human motion recognition is greatly affected by the spatial distribution of the image. The uneven distribution of the area will reduce the peak signal noise of the image and affect the reliability of the recognition. Therefore, the use of image processing and computer three-dimensional vision analysis methods to reconstruct the three-dimensional vision of human motion images is of great significance in the guidance of human motion, and the related research on human motion recognition methods has received great attention (He et al.,2018; Zheng et al.,2018).

The 3D visual reconstruction and recognition of human motion images is based on the image reliability enhancement processing.

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Knowledge graph is an information enhancement method with better current application performance. The knowledge graph is called knowledge domain visualization or knowledge domain mapping map in the library and information industry. It is a series of various graphics showing the relationship between knowledge development process and structure. It uses visualization technology to describe knowledge resources and their carriers, excavating, analyzing, constructing, Map and display knowledge and their interrelationships. It has the advantages of narrowing the search scope and improving the search content and breadth. Therefore, we proposes a knowledge graph-based human motion recognition reliability enhancement algorithm. It is expected that the image enhancement can be achieved through the extraction and reconstruction of the knowledge graph set, so as to find a more effective human motion recognition method. Contribute to the development of computer vision. The results show that the overall performance of the algorithm in this paper is better and has certain advantages. The first part of this paper introduces the introduction and related work, the second part introduces the algorithm of this paper, the third part introduces the results and discussion, and finally the conclusion.

2. RELATED WORK

In the traditional methods, there are mainly linear enhancement methods, subspace enhancement methods, and wavelet enhancement methods for enhancing the reliability of human motion images (Han, 2018; Liu et al.,2018). The contour feature of human motion image is extracted, and edge contour feature detection method is used to realize human motion recognition and reliability enhancement. Literature (Chen et al., 2017) proposed a time-varying reliability analysis method of trajectory mechanism motion based on joint probability. The system reliability of the planar trajectory mechanism is treated as a series system reliability composed of various failure modes. At the same time, each coordinate component is also processed as a cascade system consisting of N discrete points of the trajectory, and the multi-dimensional normal distribution function is used to solve the motion reliability of the trajectory mechanism. Finally, the validity of two planar trajectory mechanism verification methods is given; However, the reliability of this method for motion analysis needs to be strengthened; Literature (Jia and Li, 2017) established a multi-layer mapping model of the factors affecting motion reliability to realize the coupling relationship of various factors and the recursive relationship of motion reliability. The limit state function is constructed by incorporating on-orbit task constraints, and a nonlinear response surface method is introduced to achieve a fast solution of sensitivity. In this way, the real-time application requirements in orbit are met while avoiding the continuous partial derivative problem of multidimensional integration in the traditional method. However, the algorithm has a large error; Literature (Zou and Hou, 2017) proposed an efficient method for human motion recognition. The three views of the depth sequence are converted into a depth motion profile sequence (DMOS) by the inter-frame difference method. Then use the space-time pyramid to subdivide the temporal and spatial dimensions of the DMOS, and then fuse the local direction gradient histogram (HOG) of the spatial grid obtained by the subdivision, and use linear SVM classification. Finally, the MSR Action 3D data set was used to evaluate the recognition rate and processing speed of the proposed algorithm under different spatiotemporal pyramid parameters. The overall performance of the algorithm is better.However, the uneven distribution of image spatial regions results in low peak signal-to-noise ratio for image reliability enhancement.

In this paper, an algorithm for enhancing the reliability of human motion recognition based on knowledge graph is proposed. This paper reconstructs the three-dimensional contour feature reconstruction model of human motion images by reconstructing the spatial characteristics of human motion and reconstructs the contour structure of human motion space edges. At the same time, the