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Research Article

Dance Movement Recognition Technology Based on Multifeature Information Fusion

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Multifeature data integration technology uses computer technology to automatically analyze and process the observation data obtained by multiple sensors in chronological order according to a defined threshold. And it can complete the necessary decision-making and evaluation tasks in the data processing process. This article is aimed at studying the effect of multifeature information fusion on dance movement recognition technology. The article mainly adopts the principle of structural risk mitigation and the image thresholding method to effectively obtain the binarized image of the dancer's moving image, so as to select an appropriate threshold, use the threshold as its distinguishing standard, and then segment the pixel threshold. The method of multifeature information fusion and dance movement recognition technology is introduced. The performance of image classification algorithms is compared, and the experiment of dance video movement, human behavior recognition, and gait phase recognition are carried out. The experimental data show that in the power identification algorithm of this article, when the peak value is 1000 bits, the experimental data is 256 bits, the analysis and comparison data is 457 bits, and the experimental environment is 812 bits. When the peak value is 2000 bits, the experimental data is 451 bits, the analysis and comparison data is 635 bits, and the experimental environment is 947 bits. The experimental data is 562 bits, the analysis and comparison data is 546 bits, and the experimental environment is 774 bits. The experimental results show that the dance action recognition technique based on multifeature information fusion is studied well.

1. Introduction

In recent years, action recognition has become a hotspot in computer vision research. And it has greatly research value. Scholars and research institutions at home and abroad have done a lot of research and achieved great success. However, there are few researches on the application of motion recognition technology in dance videos. The main reason is that the complexity of human movements in dance videos is quite high. At the same time, there is still a problem to be solved in dance. This reduces the accuracy of motion perception; so, the development of motion detection and recognition in dance videos is relatively slow. With the continuous development of multi feature data integration technology and sensor based human behavior recognition technology, it is developed rapidly and widely used in motion detection and other fields. Sensor-based methods can better reflect the nature of motion and have excellent advantages in portability, cost, and ease of maintenance. Although sensor-based human behavior recognition has made great progress in various fields, there are still some important issues need to be resolved, such as the possibility of exporting in a more efficient way and how to make a high-precision, low-complexity classifier.

With the development of computer technology, human-computer interaction is constantly innovating. From the traditional mouse and keyboard to the popular touch screen to the advanced voice control technology, human-computer interaction technology is becoming more human than traditional human-computer interaction. Gesture interaction has the advantage of nontouch functionality. Therefore, it is very important for human computer interaction technology

research to be based on gestures. In the 21st century, mobile phones have entered a period of rapid growth. With the rapid development of mobile phones and the emergence of smart phones, the mobile Internet has also emerged and developed rapidly. As the era of mobile Internet changes, most people mainly rely on touch screens to interact with their phones. Touch screen is a convenient and natural way of man-machine interaction. It is capable of using speech for human-computer interaction. Modern human-computer interaction based on speech interaction has become a research center. Say a word to a machine using voice commands and it will perform specific tasks that are more natural and in line with today's human interaction. This is due to improved computer performance and rapid advances in deep learning, voice, face, and gesture recognition. Computer vision and intelligent robotics are advancing even faster. And natural and effective human-computer interaction began to attract. The most effective and intelligent human-computer interaction is not just a machine for understanding human natural language but it also helps to understand human body language. Gestures are an important form of body language. Therefore, gesture interaction has become an indispensable part of intelligent human-computer interaction. With the rapid development of information technologies such as computers, communications, and the Internet, the importance of electronic information security has become more and more prominent than ever. The necessary prerequisite for system security is identity authentication. People register for network services, online shopping, and bank access. Money, consumer credit cards, e-government, finance, e-commerce, and other application fields require identification [1].

Many scholars at home and abroad have made their own judgments based on the research of dance movement recognition technology based on multifeature information fusion. Zhai uses the semantic inference and information transfer function of graph convolutional networks to mine and deduce the relationship between attribute features and dancer features and obtain more expressive action features, thereby achieving high-performance dance action recognition. The test and analysis results of the data set show that the algorithm can recognize dance movements, effectively improve the accuracy of dance movement recognition, and realize the dancer's movement correction function [2]. In view of the delay and energy consumption of terminal equipment caused by high-speed data transmission and calculation of virtual technology, Xu and Chu proposed a sports dance movement transmission scheme with equal power distribution on the uplink [3]. In order to improve the ranging accuracy and active measurement range based on peak discriminator (PD), Jie proposed a ranging method based on the differential time domain method (DTDM). We developed a mathematical model and concluded that the zero crossing sensitivity is an important factor affecting the DTDM ranging error. In addition, the zero crossing sensitivity is determined by the delay time [4]. Lee et al. need to conduct prospective studies using standardized injury and exposure measures to consolidate our understanding of the incidence of injuries and risk factors related to musculoskeletal injuries among preprofessional dancers. The purpose of their research was to investigate the incidence of injuries among preprofessional dancers attending a full-time training school in New Zealand. The secondary purpose of this study is to investigate the relationship between dance exposure and injury risk, as well as the relationship between risk factors (especially the MCS result score) and injury risk [5]. Jeon's research compares the effects of positive and negative feedback on dance students. 28 female students took 60 lessons in two weeks and learned Jangguchu, a traditional Korean inspiration. Half of the students received positive feedback on their performance in the learning phase, while the other half received negative feedback [6]. Byczkowska-Owczarek's article introduces examples of culture, dance, and body in the field of communication (with self, community, God), social hierarchy, social values, relationship between individuals and groups, and relationships between people from the perspective of dance sociology. Sociological perspectives also indicate the various historical and ritual, controlling and regulating roles played by traditional and modern dances in the communities where they appeared and performed [7]. Liu researched line dance moving target detection technology based on machine vision to improve target detection. For this reason, the frame difference of the improved background modeling technology is combined with the target detection algorithm. Extract moving targets and perform postmorphological processing to make target detection more accurate. On this basis, the tracking target is determined on the time axis of the moving target tracking stage, the position of the target in each frame is found, and the most similar target is found in each frame of the video sequence [8].

The above scholars do not have a comprehensive understanding of multifeature information fusion and virtual technology. Therefore, this paper makes a far-reaching study on dance movement recognition technology on the basis of the above scholars' views and makes a prospect for the future development of dance movement recognition technology based on multifeature information fusion.

2. Dance Movement Recognition Technology Based on Multifeature Information Fusion Method

2.1. Multifeature Information Fusion. The multifeature recognition technology of human motion is widely used in many fields such as intelligent video surveillance. Video content retrieval has high research value and is a very difficult and popular research topic in the field of computer vision. This article discusses the two key aspects of deep recognition of human actions from the current research and development status at home and abroad and how to recognize existing actions, by examining the combination of multiple features such as action representation and action classification, and the motion attributes describe the motion information of the object [9]. And it is generally regarded as a necessary feature in the isolation feature of action recognition. The optical flow method is often used to extract motion

information. Abstract luminous flux refers to the instantaneous speed of an object due to changes in surface pixels when it is moving. Then, apply grayscale pixel ratio changes to dance videos. And the relationship between the pixels to be determined the position change of a single pixel, and the generation of luminous flux is generally caused by the movement of the camera. In this paper, the optical flow method is used to distinguish the movement attributes, and two descriptors are used: optical flow direction histogram and motion limit histogram [10, 11]. Optical flow direction histogram statistics, optical flow information, traffic limit histogram statistics, and optical flow tilt in two directions. Both of these data are based on optical flow calculations. Multibiological feature recognition technology improves the accuracy of overall decision-making by combining data provided by multiple biological features. The multibiological character recognition system has two ways to combine multiple identical biological traits and multiple different biological traits [12]. The multifeature recognition technology of human motion has a very wide range of uses. For example, it can be used for face recognition in traffic systems, filtering and screening of criminals, and attendance systems for schools and formulas. Since the biometric recognition process is actually the adopted biometric pattern recognition process, the pattern recognition can be roughly divided into attribute extraction, pattern matching, and decision-making [13]. Therefore, according to the degree of fusion, the fusion processing of multiple biological features can generally be divided into "feature layer fusion," that is, fusion-decision layer fusion. Gesture interaction also has some shortcomings and problems. Although it is convenient, it is also easy for users to expose their own information, which causes unnecessary trouble.

In the process of multitarget monitoring, data association is the key technology. Data association is the process of comparing the observation data received by the sensor with the known target part, and finally determining the correct observation/monitoring coupling, or create a new track. Most related methods include a method. The most common representative is the Joint Likelihood Data Link (JPDA) method [14]. The NN method is effective. The statistical distance is measured for the closest target prediction. Observation is the goal, and JPDA believes that all valid observations can come from the goal, but each valid observation has a different probability relative to the target, using a weighted sum of probabilities. The NN method is a statistical distance calculation. When JPDA calculates the relative probability, it only uses the data directly related to the calculation of the target state vector. The data can also receive additional information about the target and how to use other functions. This information is used to improve the effectiveness of the target link. In the active radar position, multitarget consistency is the only extended NN method, and it is still the most suitable algorithm in the machine. Biodiversity fusion recognition technology is a technology that combines multiple biological characteristic data to provide complete recognition. Data fusion technology is a new theory and technology for efficiently processing multisource data. Processed is by multiple sensors. It can obtain new and more complete information. These new data cannot be compared with a single sensor [15]. The main goal of data aggregation is to obtain more accurate data from a single input through aggregation.

2.2. Dance Movement Recognition Technology. The choreography of dancers is very different from the daily choreography of normal people. Many movements require the dancer's arms and legs to be brought together. When selecting the target area for background recognition, it is necessary to obtain the dancer's whole body motion data. The correct understanding of their behavior and the perception of dancers' movements can be divided into several categories: static characteristics, which are mainly manifested in size, color, body shape, depth, etc. [16, 17]. The target is of the dancer's face. It can convey comprehensive information about the dancer's movements, for example, through the dancer's shadow. You can draw the current basic shape. The dancer's movement path remembers these characteristics to calculate the nature of the dancer's movement direction. To create conditions for modeling, the characteristics of time and space are mainly expressed in descriptive ways, such as the shape of time and space and points of interest, such as dancers' scenes, surrounding objects, and gestures. Dance video image recognition takes into account the obstacles of dance background and clothing to motion recognition [18]. The movements must be memorized in order to accurately record and fully reflect the dancer's movement data, static data collection technology, and dancer's body movement data. From existing research, this document provides a specific memory method. These methods are suitable for the nature of dancers' movements, can accurately detect and recognize dancers' movements in dance images, improve the accuracy and efficiency of recognition, and have great value applications. Enter average trajectory, distance, direction of travel, and average speed to describe the trajectory of the target. First, each attribute area is grouped using the mean shift algorithm to retrieve potential traffic categories. More attribute fusion algorithms are designed to fuse the classification data by calculating the relationship between the categories in different attribute regions and finally get the clustering results of the data combination of multiple attribute regions [19]. This is because data integration occurs at the grouping level. Therefore, when combining at the spatial level, the problem of dimensional integration can be effectively avoided. The study of human behavior perception can be summarized into three levels according to the content of behavior from simple to complex: visual movement. There are mainly the following two problems: one is in the identification process [20]. Most of the information in the video action frame is repetitive or has little relevance to action recognition. This not only increases the computational complexity but also affects the accuracy of action recognition. Secondly, in the process of selecting and understanding attributes, the main method is to combine representation and posture features, but the choreography scenes and costumes are variable. And based on the nature of information gestures, it is easy to ignore the static state of the human body [21].

As a branch of human behavior perception, dance action recognition based on multifeature fusion has received extensive attention from research institutions at home and abroad and is widely used in many fields such as authentication. In exoskeleton robots and rehabilitation medical equipment, most of the current domestic and foreign researches use unobstructed indoor tents, and the collected plantar pressure data is also local plantar pressure data. Recognize the effective walking distance under complex road conditions, such as blind roads and grass. This article will introduce how to identify walking distance in complex road conditions and consider a combination of many features in terms of total tread pressure. An important issue in the study of data association algorithms is how to improve the quality of data association when multiple targets fly over. Because when multiple targets fly over, due to the influence of measurement noise and various interferences [22], the uncertainty of the measurement value is relatively serious, and related errors are prone to occur, leading to track exchange. Incorrect related results will cause serious consequences. Countless losses the effective way to solve this problem is to use multiple target feature information obtained from radar measurement data as a basis for judging whether the measurement is related to a known target. View the real and complete data acquisition method of ethnic dance movement records and use it as a guide for collecting dance data. At the same time, this article takes the creation of dance movements as an example to introduce the follow-up digitization of ethnic dance. Making models with national characteristics, it is supplemented by tying the bones and then connecting the role model with the action. The dance performance information and motion capture data drive the character model to create animation goals and improve the efficiency of animation production. It shows how to use dynamic technology to protect our country's art and dance culture. The use of motion technology to promote digital folk dance will bring positive social and economic benefits. The method of creating 3D dance data based on motion capture is the process of recording the actions of entities (dancers) and then mapping the recorded actions to virtual objects generated by the computer. The current motion capture systems are mainly divided into five types: mechanical motion capture systems, acoustic motion capture systems, electromagnetic motion capture systems, inertial motion capture systems, and optical motion systems. Optical motion capture technology is currently the most widely used and mature shooting technology [23]. The optical motion system uses optical principles to capture the 3D motion process as follows: first, the equipment detects errors, calibrates the camera, and determines the range of motion of the performer. At the same time, in order to facilitate collection and processing, performers are usually required to wear casual clothes and to stick reflector "marks" on key parts of the body. Multiple cameras are then used to capture the actor's movements through "marked" points on the body and images. In digital image processing, the binary image occupies a very important position. The binary image of the image greatly reduces the amount of data in the image, which can highlight the contour of the target [24]. The sequence is stored for analysis and processing, determining the signal points and calculating their spatial position at any given time and mathematically plotting the three-dimensional coordinates of each reflected signal. When the data is recognized by the computer, the data can be combined with the animation, the character can be combined into an animation, and then the animation can be easily edited into a computer-generated download.

2.3. Algorithm of Dance Action Recognition Technology Based on Multifeature Information Fusion. In the K-means algorithm, the final clustering effect is affected by the initial clustering center. The proposal of the K-means++ algorithm provides a basis for choosing a better initial clustering center. However, in the algorithm, the clustering categories are the number k still needs to be determined in advance. For a data set whose number of categories is unknown in advance, it will be difficult for K-means and K-means++ to accurately solve it. For this, some improved algorithms have been proposed to deal with the unknown number of clusters' k situation.

Image thresholding can effectively obtain the binarized image of the dancer's moving image, so as to select an appropriate threshold, use the threshold as its distinguishing standard, and then segment the pixel threshold [25]. The threshold usually takes the following form:

$$T = T[x, y, f(x, y), p(x, y)], \tag{1}$$

$$A_n = \frac{n+1}{\pi} \sum_{i=1}^{\text{image}} \sum U(i, \mu, \lambda)[V_{\min}(r, \theta)], \tag{2}$$

$$T = \{(x_1, y_1), (x_2, y_2), \cdots, (x_n, y_n) - \sum_{i=1}^{i} \alpha_j, \tag{3}$$

$$\min \frac{1}{2} \sum_{i=1}^{i} \sum_{j=1} y_i y_l \alpha_i K(x_1, x_i). \tag{4}$$

Select appropriate functions and appropriate parameters [26] and construct and solve the optimization problem, as shown in the following formula:

$$\text{st} \sum_{\text{j}=1}^{\text{i}} \text{y}_\text{i} \alpha_j = 0, 0 \le \alpha \le C, \tag{5}$$

$$\beta = y_j - \sum_{i=1}^{l} y_i \alpha_i^2 K(x_1 - x_2), \tag{6}$$

$$f(x) = \text{sgn}\left(\sum_{i=1}^{l} \alpha_2^1 y_i K(x, x_1) + b^2\right), \tag{7}$$

$$U(i, \mu, \gamma) = (x_1 - x_{i-1})^{\mu} (y_i - y_{i-1}). \tag{8}$$

The similarity measurement of dance moves is based on

Video capture of dance moves

Dance video binary image

Figure 1: Prospects of dance moves.

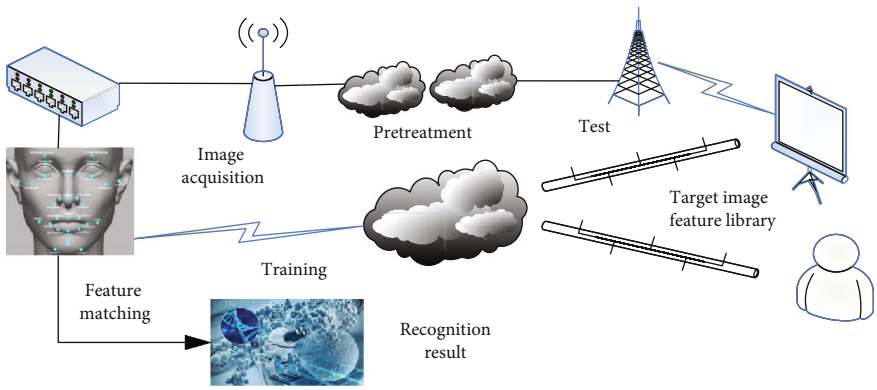

Figure 2: Action recognition system.

whether the directions of the vectors are similar [27], and the similarity coefficient can be expressed as

$$\cos(x, y) = x^t y / \left[\left(x^t x\right)\left(y^T y\right)\right]^{\frac{1}{2}}, \tag{9}$$

$$g(x, y) = \text{media}\{f(x - i, y - i)\}(i, j) \in W. \tag{10}$$

Adding formulas (9) and (10), the following formula will be obtained.

$$f(a, b) = 1 - \frac{2\sqrt{(a+1)} + (b+1)}{(a+1) + (b+1)} \times \frac{2\sqrt{(212-a)} + (256-b)}{(256-a)}. \tag{11}$$

After the period detection is performed on a video sequence, a normalization process can be performed [28], so that the period calculation is performed by using the distance from the center of mass to the outer contour of the human body. The calculation formula is

$$x_c = \frac{\sum_{x,y} x l(x, y)}{\sum_{x_1, y_2} l(x, y)}, \tag{12}$$

$$y_c = \frac{\sum_{x,y} y l(x, y)}{\sum_{x,y} I(x, y)}, \tag{13}$$

$$D_T(x, y) = \begin{cases} f_t(x,y), t=0 \\ \|f_t(x,y) - f_{t-1}(x,y)\|, t>o \end{cases}, \tag{14}$$

$$S = \sum_{i=1}^{n} \frac{Z_i Z_t}{2} + 1. \tag{15}$$

Recognizing the image of a given set of dance moves and minimizing the target, the objective function is obtained as follows:

$$\min \sum_{i,j} \frac{1}{2} \|y_i - y_t\|^2 S_i, \tag{16}$$

$$\arg\min = Av - i \times v^T A^T (L \otimes I_m), \tag{17}$$

$$\mu_i(X, c) = \frac{1/\|X - c\|^{2/(a-1)}}{\sum_{j=1}^{k} 1/\|X - X_1\|}. \tag{18}$$

Through the above formula, the average value formula of the video can be obtained:

$$g_c(X) = \max \sum_{i=1}^{2} \mu_1, \text{ then } X \in c, \tag{19}$$

$$Z = [z_1, z_2, .., z_k]^T, z_i = x_i + jy_1. \tag{20}$$

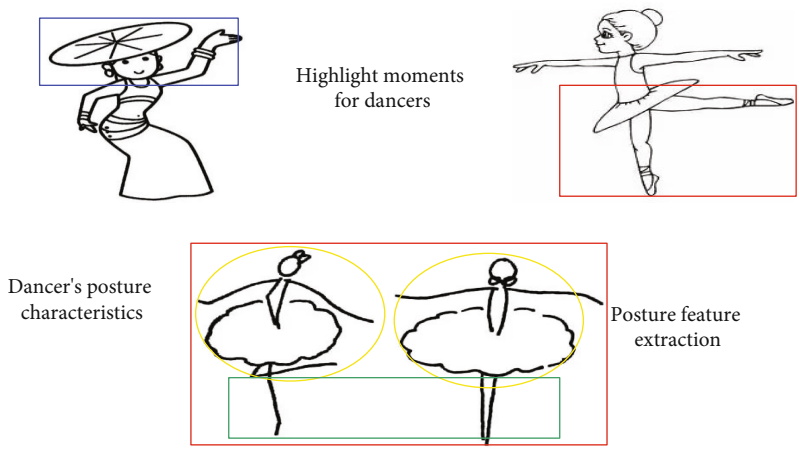

Figure 3: Change of dancer's movements.

3. Experiment of Dance Movement Recognition Technology Based on Multifeature Information Fusion

In the dance image, in addition to the dancer's first goal, there are many other backgrounds, such as space equipment, environment, and lighting. The existence of these different backgrounds increases the complexity of the scene. The first goal can be achieved by removing the background: the total area of the human body. This can reduce the difficulty of remembering actions. There is a lot of research on removing background. According to the particularity of the dance video image, this article chooses the Gaussian composite model, which can remove the background. After the calculation of the cycle, we can get the specific calculation method of the human body recognition technology, and through this method, the result corresponding to each technology can be detected.

3.1. Experimental Description and Experimental Strategy. This article focuses on the application and impact of motion recognition technology on video images. Especially for dance videos, this article divides grayscale, binary, and images into action video images and then calculates the 3DZemike interval of the processed binary image as the action classification feature. Then, the 3DZemike torque similarity factor is applied to the standard classification criteria, and finally, the KTH database and the A-go-go dance video database are classified and recognized by the SVM supporter, and good recognition is obtained. This research explores the vision-based video action recognition technology. This technology performs preprocessing tasks such as grayscale and background removal and reduces filters in the generated video dance images. Then, perform character actions in the video series. Next, use the SVM support engine to extract some fragments from the object attribute sample set for model learning and training. Then, after completing the training, perform action classification and other perception areas. The indepth application of computer-assisted teaching has not only enriched the teaching content. It also makes up for many shortcomings of traditional teaching methods. The

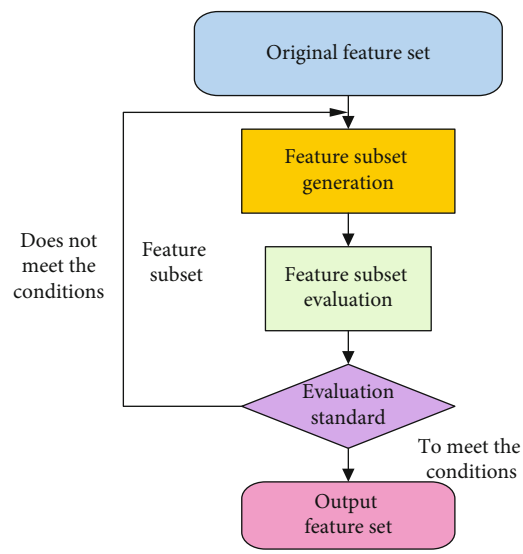

Figure 4: Feature selection process.

powerful combination of motion capture technology and dance teaching is a form of computer-assisted teaching. This creates a perfect fusion of 3D virtual world and augmented reality technology. "In recent years, researchers have conducted extensive research on the application of motion capture and described the technology of animation elements and the elimination of rolling steps in the animation production process." This shows that the use of motion capture technology is widespread, and dance is a body in sync with the rhythm of the movement, but learning to dance is not as easy as individual differences and rhythm. In order to improve this situation, the author recommends the use of motion capture technology to assist dance teaching and research and to transform dancers' 3D movement data into digital subtraction movements to create a three-dimensional foundation, as human movement data creation teaching cartoon is very important to change the disadvantages of traditional dance teaching. And it can improve the quality of education and teaching. GMM refers to the linear combination of multiple Gaussian distribution functions. In theory,

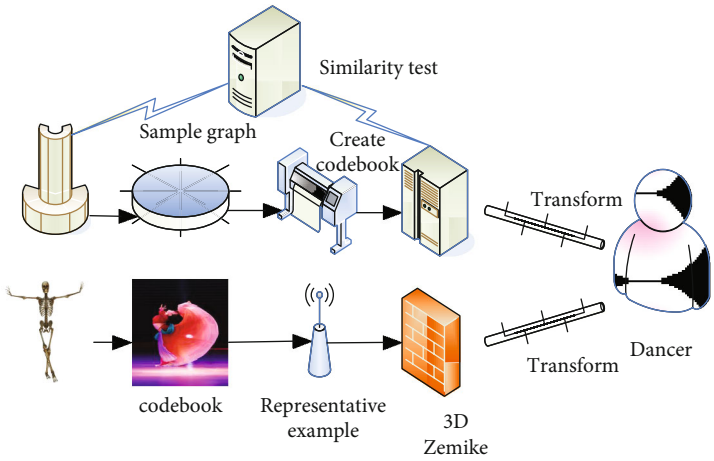

Figure 5: Cycle similarity measure.

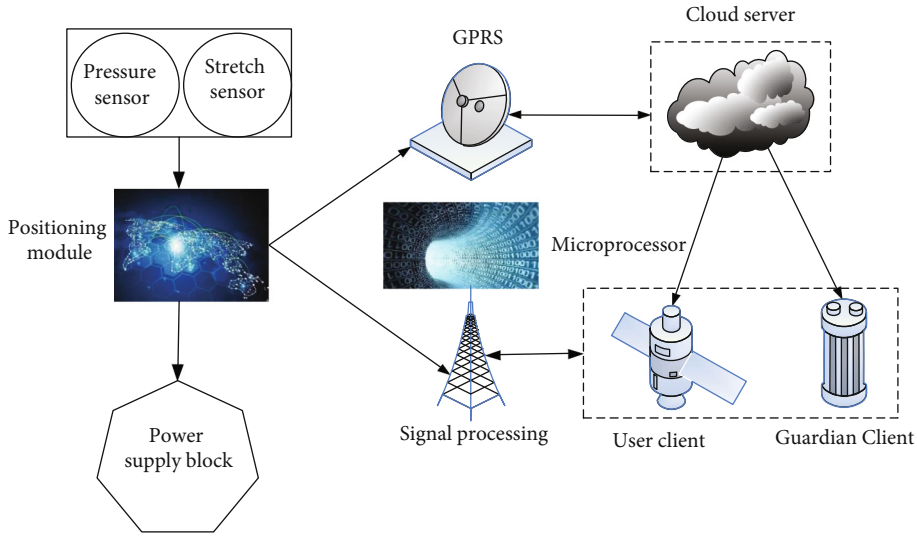

Figure 6: Dancer node recognition model.

GMM can fit any type of distribution. It is usually used to solve the situation where the data in the same set contains multiple different distributions.

3.2. Sample Collection. Understanding of human behavior in videos is the focus of computer research today. Its purpose is to isolate and analyze the actions in the video through image processing and various recognitions and classification techniques. Determining the actions of the characters in the video provides useful information for a variety of purposes. The key to recognizing human actions in the video is to rationally process the original video and export the video image attributes. Research on the integration of motion recognition technology and dance art has just started in China. Dance videos use human movement recognition technology, which can effectively identify rhythmic movements. Compare video actions with standard actions, you can evaluate the dancer's attitude and make suggestions on how to adjust. This is an advanced, high-intensity training. This paper proposes a method of grouping moving target trajectories based on the convergence of multiple attributes. Perform independent trajectory grouping for each attribute area to obtain a set of basic trajectory classification results and then combine these groups corresponding to each attribute category result area to avoid the problem of regional flatness. First, consider the characteristics of spatial location. Direction is angel of movement. The method of complete interpretation is the speed of the trajectory data and the trajectory data. This feature is convenient for better identification of the target. Aiming at the motion law of the target in the scene, the mean-shift method is used to group each trajectory area to realize the distribution of the trajectory area or trajectory. This is because the mode of distributing motion between feature gaps is partial. Finally, the grouping results between feature spaces can be combined to fully extract the motion distribution pattern in the trajectory data. The most

Table 1: Image classification algorithm performance comparison results.

Index	Algorithm	Traditional algorithm	Image classification algorithm
Peak signal-to-noise ratio/dB	21.3	13.6	23.5
Execution time/ms	20.6	21.5	24.1
Performance	2.2	3.6	5.6

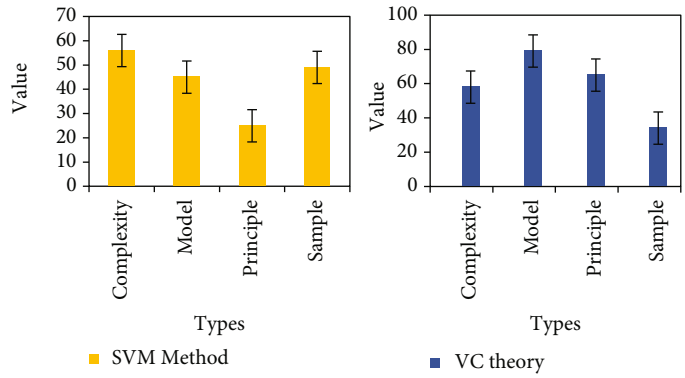

Figure 7: SVM method.

important of these is the environment and space equipment, which will affect the dance athlete's posture, movement performance, and angle estimation.

3.3. Experimental Data and Result Analysis. Normally, in many dance videos, the stage is mainly characterized by the prospect of the dancer as the main object. Different pixels in the video dance image are used to match the Gaussian model. If the match is successful, it can be regarded as a reference point. If the match fails, it can be judged as the first point to separate the background from the foreground, as shown in Figure 1:

Match the dance action features to be recognized with the images in the template library, as shown in Figure 2:

The stop level sensor can be used when using the gesture separation method. It is widely used in robot detection and motion vision to judge the movement direction of the dancer. The light flux value in the detection system can be used to filter the background information in the image to obtain the dancer's approximate coordinates. This removes the influence of factors such as "the dancer's shadow and clothes" and also affects the dancer's movements. Engineering robots are teleoperation multijoint manipulators or multi-degree-of-freedom robots that rely on their own power and control capabilities to perform engineering construction operations in high-risk and special environments. It not only has the advantages of high-power, multifunction, and wide application range of construction machinery but also has various functions such as flexible movement of robots, environment perception, and intelligent recognition. The dancer's posture is shown in Figure 3.

There are two main methods for feature selection attributes. How to directly select attributes and how to reduce the size and direct attribute selection methods that directly analyze the attributes, select the features that have

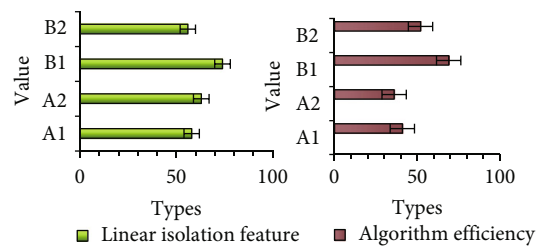

Figure 8: Kernel function.

the greatest impact on the ranking and memory results, and delete the attributes that have less impact on the classification results, as shown in Figure 4:

The codebook contains most of the representative examples in the example area. These examples can distinguish this category from other categories in this article. Use the cluster analysis method to create a codebook. First, define the similarity of each category to describe the similarity between the categories. This algorithm belongs to feature surface matching. Compared with terrain matching based on feature points and feature lines, theory and practice have proved that this algorithm has higher matching probability and matching accuracy. This document uses the 3DZemike period similarity metric to create a codebook, as shown in Figure 5:

Establishing dancer node recognition modeling can better recognize and help dancers better correct dance movements, as shown in Figure 6:

Through the comparison of the performance of image classification algorithms, we can see the results of each classification algorithm, as shown in Table 1:

The SVM method uses the VC dimension theory of statistical learning theory and the principle of structural risk

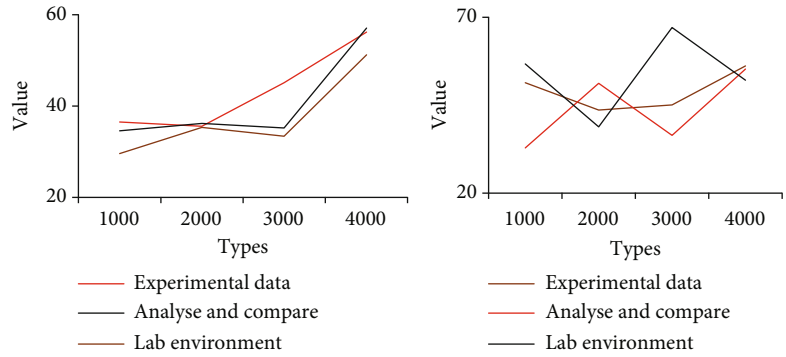

Figure 9: Power recognition algorithm.

mitigation. A limited data sample finds the best balance between model complexity and acquired learning ability. The basic idea to obtain the best generalized capacitance is to convert the input vector into high-dimensionality through a certain type of nonlinear mapping, and the feature region allows linear separation of nonlinear and traditional nonlinear isolated feature spaces, as shown in Figure 7:

The core function of the dance movement recognition technology based on multifeature information fusion is to match the linearly isolated feature area with the high-dimensional space and then proceed to the internal operation of the product. You can change the high-dimensional area. The inner product of the space is equivalent to the inner product of the original low-dimensional space. This greatly reduces the dimensionality of data processing and avoids spatial dimensionality and improves algorithm efficiency, as shown in Figure 8:

The efficiency of the power recognition algorithm in this paper has been confirmed in various video data sets. The main content is experimental data.

Video analysis and comparison are erimental environment, experimental design, and experimental results, as shown in Figure 9 and Table 2:

To test human behavior recognition and gait phase recognition in the same way, completely different experimental results can be obtained, as shown in Tables 3 and 4:

The experimental results of the dance video movement show that, during the action training process and the action test process, each process includes multiple feature extraction and description, as shown in Figure 10 and Table 5:

Table 2: Power recognition algorithm.

	1000	2000	3000
Experimental data	256	451	562
Analyse and compare	457	635	546
Lab environment	812	947	774

Table 3: Dance behavior recognition.

	Test data	Test result	Result analysis
Optimize feature classification	4517	5112	4365
Plantar pressure	561	442	324
Dance behavior recognition	28	17	32

Table 4: Human gait recognition.

	Test data	Test result	Result analysis
Optimize feature classification	254	352	411
Plantar pressure	2031	1459	1547
Human gait recognition	31	16	28

4. Discussion

In the passive positioning system, the target state carrier can be directly calculated by measuring DOA, TOA, and Doppler frequency. This is referred to below as target state measurement. The general target data reported here includes target state measurements. The working frequency pulse width and pulse repetition time are similar to the BPAF of the D2S hypothesis theory, and we put forward the concept of correlation. Correlation refers to the degree of correlation between the effective observation of the individual in the gateway and the actual target based on certain characteristic data. Evidence integration is the process of combining evidence into a new body of evidence within a framework. Evidence-based multifeature data integration refers to the combination of multifeature data based on effective observations in the gateway. The correlation degree of attribute data determines the correlation degree between each effective observation in the gateway and the actual target. Most of the images in the dance video are in color. If you directly enter the computer vision system without conversion, the amount of data input from the image increases. As a result, the amount of subsequent calculations is increased, and processing color images in grayscale videos can reduce the number of subsequent calculations and improve the efficiency of computer vision recognition operations. The gesture recognition method based on pattern matching mainly acquires

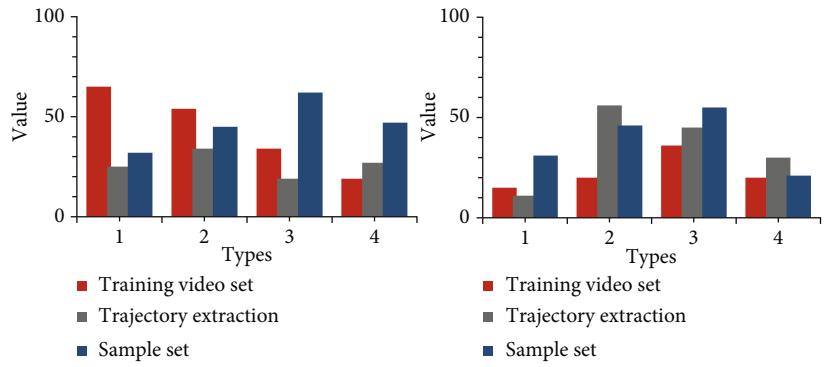

Figure 10: Video release rate.

Table 5: The main process of the experiment.

	Number	Results	Process
Construct a dictionary	1542	5321	1324
Quantitative training video	654	721	459
Video classifier	23	54	61

gesture patterns by learning different types of gesture data. The specific idea of this method is to match the previously learned gesture images with known patterns. The degree of similarity between the standards the process of dynamic gesture recognition can be divided into the following steps: first, the gesture is converted and simulated into a static gesture sequence. Then, the sequence of gestures to be recognized corresponds to the sequence of learning gestures and their similarities.

5. Conclusions

In the past few years, with the continuous development of computer vision, deep learning and human-computer interaction technology, which is more personalized than mouse and keyboard, have become a new research topic. And there are other technologies and more that are also applicable to humans, such as machine interaction, face detection, and face recognition. Human-computer interaction such as speech recognition and synthetic facial expression recognition, which is more mature than gesture recognition, human-computer interaction assessment, and examination, is indispensable in people's daily life and as one of the important components of modern human-computer interaction. Gesture recognition based on vision has also made great progress and become an important issue of people's attention. When using the gesture feature extraction method, gesture sensor can be used, which is widely used in the field of motion monitoring and robot vision, and can set the direction of the dancer's movements. The value of the image stream in the pose estimator can be used to filter the background data in the image to obtain the coordinate space of the dancer's joints.

Data Availability

The data that support the findings of this study are available from the corresponding author upon reasonable request.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

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