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Research Article

Sports Video Image Segmentation Based on Fuzzy Clustering Algorithm

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With the development of science and technology, people began to use video image segmentation technology to carry out various research works on sports, to expect effective athlete training effects. Fuzzy clustering algorithm can accurately and quickly extract the distorted data in the process of sports video image segmentation. In order to ensure that the motion curve is not easily affected by noise in the drawing process, this paper studies the sports video segmentation strategy. The fuzzy clustering algorithm can accurately and quickly extract the distortion data in the process of segmentation of sports video images. Therefore, the motion curve is not susceptible to noise during the drawing process, which can be ensured. After completing the above-mentioned sports video segmentation strategy completion experiment, the Release to Manufacturing (RTM) model is used to evaluate the experimental results of the sports video segmentation strategy. According to the RTM model test results, the result of the homogeneity test of variance is that since the result is much larger than 0.10, this can infer that the image quality obtained by the sports video segmentation experiment has reached the Spearman Rank Order Correlation Coefficient (SROCC) standard. Experiments verify the feasibility of applying fuzzy clustering algorithm and moving video image segmentation technology to the segmentation of human model moving video image, so as to obtain more accurate image data.

1. Introduction

With the advancement of science and technology, a large number of new technologies have emerged in the society. People's lives have also undergone tremendous changes due to the emergence of these high-techs, and various production activities have become more intelligent, and lifestyles are more convenient. In particular, the rapid rise of computer technology in recent decades has covered all aspects of people's life production (Li) [1]. Among them, image processing technology is constantly improving and developing, which plays an irreplaceable key role in many fields. In recent years, scholars have introduced the technology into sports video analysis, using the excellent image analysis capabilities to video. The screen is analyzed to help the relevant staff analyze the movements, improve the movement skills, and help the athletes improve their ability (Qiu and Xiang) [2]. When processing an image, considering that it has many characteristics, identifying and tracking elements in the image according to differences in grayscale and color are necessary. However, since the image is large and contains a lot of information about various elements, the image is segmented and refined according to the purpose of video processing, and then the segmented image is parsed (Dai et al.) [3]. The objects that need to be studied are segmented from the screen to be effectively analyzed. Nowadays, when image processing is performed by image segmentation technology, in most cases, the analysis is according to the image that needs to be processed, and the special background of some of the image backgrounds is subjected to special segmentation processing, and the applicability is narrow, which cannot use all backgrounds. So, people began to study the image segmentation technology with wide applicability. However, since image segmentation is an ill-posed problem of insufficient information, there is not enough information to distinguish the target elements and image background, and effectively segmenting the image is difficult (Zhang) [4]. At present, the limited ability of the technical algorithm is limited, and the image cannot be perfectly segmented, so that the next image analysis cannot be performed. Therefore, the segmentation algorithm must be further improved to improve the image segmentation ability. Due to the image, there are many factors in the picture, the structure is also more complicated, the grayscale data is very rich, and there is more uncertainty in which area the pixel should be divided. Therefore, the cross fuzzy clustering algorithm is introduced into the segmentation of sports video images, which is also in line with specific characteristics (Zhou and Chang-Hui) [5].

Although sports video image segmentation technology has been developed to the present status, a large number of excellent research results have emerged. Sports video image segmentation technology has also been improved for several generations, but after all, sports video image segmentation technology is an emerging product, which is developing rapidly. In the context of the developing rapidly times, in order to carry out technicalities whose rations are also important, the previous technology will not be able to meet the actual needs. With the improvement of the analysis requirements and the development of the movement, how to improve the sports video image segmentation technology to meet analytical needs is already an urgent matter. Only by further deepening the research on sports video image segmentation technology can we provide a solid foundation for the development of sports and meet the basic needs of technical analysis. Therefore, based on the fuzzy clustering algorithm, the sports video image segmentation technology is deeply analyzed, the sports video image segmentation technology is improved, the segmentation efficiency of sports video image segmentation is comprehensively improved, and the actual segmentation effect of sports video image segmentation is improved.

The experiment uses fuzzy clustering algorithm and motion video image segmentation technology to realize the segmentation of human body model sports video images. Motion segmentation (Motion Segmentation) is to analyze the motion data to find the segmented key frame data, which has strict requirements on the authenticity of key frame data. The fuzzy clustering algorithm is a data calculus method that uses the random sampling method to extract the abnormal data and obtain the mathematical model. The algorithm believes that the data that cannot adapt to the mathematical model is mainly because the abnormal data may be caused by wrong assumptions in the process of mathematical model calculation. However, these erroneous data often lack sufficient parameters to restore them. The algorithm restores real number by multiple filtering. Fuzzy c-means clustering algorithm (FCM), among many fuzzy clustering algorithms, is the most widely used and successful algorithm. It obtains the membership of each sample point to all class centers by optimizing the objective function, so as to automatically classify the samples. Therefore, the use of fuzzy clustering algorithm to extract and screen the distortion data in the process of sports video image segmentation is the future development trend of this research field.

The research mainly has the following innovations: (1) multiangle analysis of sports video image segmentation based on fuzzy clustering algorithm, by using the technical advantages of fuzzy clustering algorithm; the similar features in the image are classified, the segmentation ability of sports video image segmentation is comprehensively improved, the sports video image segmentation technology is optimized, and the results are demonstrated. (2) Using the RTM model to evaluate the experimental results of the sports video segmentation strategy, and verifying the actual effect of the theoretical model through real data.

The organizational structure is as follows: the first section mainly describes the research background and the organizational structure of the article. The second section mainly describes the research status of fuzzy clustering algorithm in sports video image segmentation. The third section mainly describes the design process of the algorithm model. The fourth section mainly describes the practical experimental research of sports video image segmentation based on fuzzy clustering algorithm. The fifth section mainly summarizes the research results.

2. Related Work

Image segmentation technology has long been a hot research project in the field of image processing. Only high-quality segmentation of images can lay a good foundation for subsequent image processing. Scholars have proposed to count the gray level of pixels in the image and analyze according to its level. The statistical results can form peak troughs. According to the characteristics of the histogram, we know that the peak reflects a relatively uniform position in the picture, and each peak corresponds to this uniform position. Then, based on the gray value, the picture is processed. Separate the target element from the background to achieve image segmentation. Since the method mainly analyzes the grayscale data in the image, the noise resistance of the image is relatively weak, and the edge of the image may be damaged, and the detail of the image is also easily lost. Akhigbe et al. proposed edge detection on the image. Because the edge of the image has the characteristics of pixel grayscale mutation, the edge of the image is detected based on the mutation, and then the specific target is selected according to the edge and separated from the background. Finally, image segmentation is achieved (Akhigbe et al.) [6]. Through investigation, the result can be found that the above method has strong antinoise ability and is suitable for the case where the elements in the image have large differences. However, if the edges of the elements in the picture are blurred, the segmentation effect is poor, and the difference between the target and the background cannot be accurately identified. Lian and Min-Jia proposed to group the pixels of similar features in the image into the same place. The difference in pixel characteristics between different places is obvious. Thus, different partitions can be easily differentiated. Moreover, the noise immunity of this method is very good, but the calculation is very large, and there may be cases of excessive segmentation (Lian and Min-Jia) [7] (as shown in Figure 1).

FIGURE 1: The schematic diagram of the algorithm model.

In order to better improve the segmentation effect, studying the special area of the pixel and arranging the actual detection sequence are necessary. The process has more uncertainty and more manpower. Luo and Zhang proposed to extract a specific feature in the image and treat the feature as a class and associate other regions according to this class, and then the division of the region within the image was completed (Luo and Zhang) [8]. Spittle and Byrne first classified the features in the image, and then through the class to correspond to each region in the image. The reason is that classifying the features becomes easier, which can be more easily used in the image. The pixels are divided, and then the target and background in the picture are segmented (Spittle and Byrne) [9]. When Liu et al. classified images specifically, because there is no perfect classification standard, the classification results were unstable, and the final segmentation effect was unstable (Liu et al.) [10]. Wang et al. believe that adding objective conditions such as grayscale and texture of the image will also affect the final outcome of the segmentation, which is still the biggest difficulty and the key point to select which features to classify in this method. The objective conditions of the image directly determine the final image segmentation effect (Wang et al.) [11]. With the deepening of research on image segmentation technology and the development of related computer technology, Tasgetiren et al. proposed more new ideas about image segmentation, such as image segmentation using neural network algorithm, or segmentation based on genetic algorithm (Tasgetiren et al.) [12]. Due to the introduction of these new image segmentation ideas, the effect of image segmentation is getting better and better, greatly improving the ability of image segmentation and promoting the development of image segmentation, which also affects the progress of this related algorithm field (as shown in Figure 2).

(a) (b) (c) (d) (e) (f) (g) (h) (i) (j) (k) (l)

Figure 2: Network distance teaching based on streaming media technology has a wealth of research.

3. Algorithm Model Design

3.1. Fuzzy Clustering Algorithm. Fuzzy cluster analysis is a mathematical method that uses fuzzy mathematical language to describe and classify things according to certain requirements. Fuzzy clustering analysis generally refers to the construction of fuzzy matrix according to the attributes of the research object itself, and on this basis, the clustering relationship is determined according to a certain degree of membership; that is, the fuzzy relationship between samples is determined quantitatively by the method of fuzzy mathematics, so as to cluster objectively and accurately [13]. Clustering is to divide the data set into multiple classes or clusters, so that the data difference between each class should be as large as possible, and the data difference between classes should be as small as possible, that is, the principle of "minimizing the similarity between classes and maximizing the similarity within classes" [14]. The algorithm believes that the data cannot adapt to the mathematical model mainly because the abnormal data may be caused by wrong assumptions in the process of mathematical model calculation (as shown in Figure 3). However, these erroneous data often lack sufficient parameters to restore them. Therefore, the algorithm restores real data by multiplying screening methods. The fuzzy clustering algorithm is widely used in the analysis and processing of video image imaging data models in engineering. The basic implementation process is as follows:

Firstly, obtaining the necessary data model data information is necessary. The acquisition method is mainly obtained by traversing the optical data model through SPSS data statistics software (as shown in Figure 4). Depending on the field of use, which can be divided into two types, one is spatial processing, and the other is frequency domain processing. The former is directly processed on the data model, while the latter is processed after the data model is specially processed (Deng and Du) [15]. The airspace processing formula is as follows:

$$g(x, y) = \mathrm{EH}[f(x, y)], \tag{1}$$

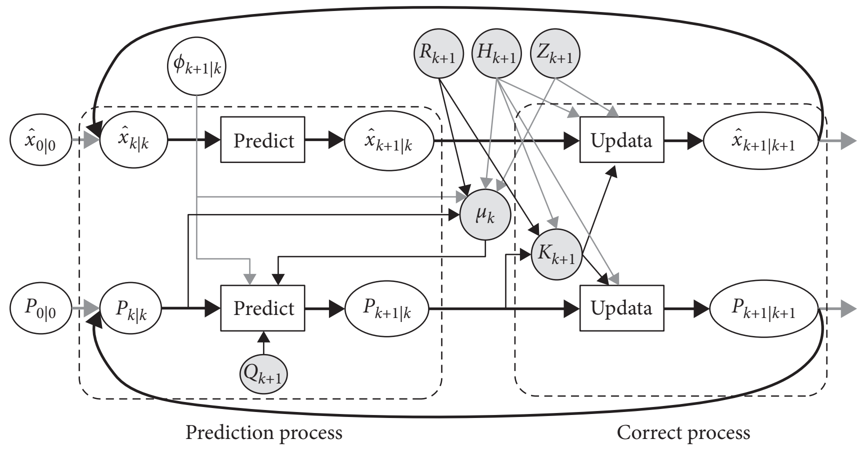

FIGURE 3: The healing of tendon injury was obtained by medical image analysis.

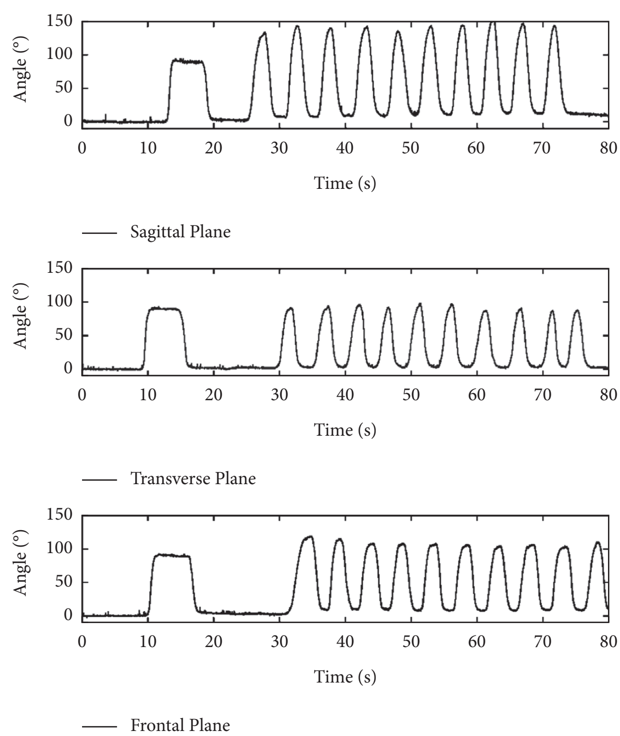

FIGURE 4: Local image information for the first derivative operator.

$f(\cdot)$ is the preenhanced data model, $g(\cdot)$ is the enhanced data model, and EH indicates enhanced operations. For a continuous function $f(x, y)$, gradient at position (x, y) can be expressed as

$$\nabla f(x, y) = G(x, y) = \left[G_x G_y\right]^T = \left[\frac{\partial f}{\partial x}\,\frac{\partial f}{\partial y}\right]^T. \tag{2}$$

A gradient is a vector whose amplitude and direction angle are

$$\begin{aligned} |\nabla f| &= |G(x, y)| = \left[G_x^2 + G_y^2\right]^{(1/2)}, \\ \phi(x, y) &= \arctan\left(\frac{G_y}{G_x}\right). \end{aligned} \tag{3}$$

The approximate expression of the gradient is

$$\begin{aligned} G_x &= f[i, j+1] - f[i, j], \\ G_y &= f[i+1, j] - f[i, j]. \end{aligned} \tag{4}$$

Usually, in order to reduce the amount of calculation, the absolute value is usually approximated by the gradient magnitude.

$$|G(x, y)| = \left|G_x\right| + \left|G_y\right|. \tag{5}$$

Then, the corner data extraction is performed on the content of the data model that has completed the preliminary processing. Suppose that there are variables I_x and I_y used to represent the first-order partial derivatives of the data model I in two different aspects of Cartesian coordinates x and y axes. Then, function $w(x, y)$ can be used to represent a two-dimensional Gaussian smoothing function on Cartesian coordinates. The calculation process of this function is shown in the following two formulas:

$$M = \sum_{x,y} w(x, y) \begin{bmatrix} I_x^2 & I_x I_y \\ I_x I_y & I_y^2 \end{bmatrix}. \quad (6)$$

Solving equation (6) yields a specific number for each corner point R on the data model. Then, using the corner points calculated by the normalization idea to match, the data model corner point value can be obtained. The matching calculation equation is as follows:

$$NCC = \frac{\sum_i (I_1(x_i, y_i) - u_1)(I_2(x_i, y_i) - u_2)}{\sqrt{\sum_i (I_1(x_i, y_i) - u_1)^2 \sum_i (I_2(x_i, y_i) - u_2)^2}}. \quad (7)$$

At the same time, the fuzzy clustering algorithm can be used to purify the corner values of the data model (as shown in Figure 5). In the process of purification, the data model needs to be purified according to the hierarchical channel mode, so there is the following linear algebraic equation:

$$\begin{pmatrix} R_2 \\ G_2 \\ B_2 \end{pmatrix} = \begin{pmatrix} c_r & 0 & 0 \\ 0 & c_g & 0 \\ 0 & 0 & c_b \end{pmatrix} \cdot \begin{pmatrix} R_2 \\ G_2 \\ B_2 \end{pmatrix} + \begin{pmatrix} d_r \\ d_g \\ d_b \end{pmatrix}. \quad (8)$$

After the data model is segmented, the similarity calculation is performed with the established data model in the database, and matching is performed according to the calculated result. The matching result of the data model is the characteristic result. Use the following function to measure the degree of similarity between T and f:

$$SE(x, y) = \sum_{i=1}^{N} \sum_{j=1}^{N} [f(x-i, y-j) - T(i, j)]^2. \quad (9)$$

Among them, the size of the data model is $N \times N$. The above formula provides a measure of the degree of matching between the data model T and the data model at the coordinates (x, y). Expand the above formula to calculate matching result:

$$SE(x, y) = \sum_{i=1}^{N} \sum_{j=1}^{N} f^2(x-i, y-j) - 2\sum_{i=1}^{N} \sum_{j=1}^{N} f(x-i, y-j)T(i, j) + \sum_{i=1}^{N} \sum_{j=1}^{N} T^2(i, j). \quad (10)$$

The characteristic result of the data model matching result is that the image can be compressed with the maximum quality to obtain the application of image segmentation similar to image smoothing, but the final goal is to separate the smoothed image to achieve the purpose of foreground and background or fixed physical segmentation. At the same time, it can also track the target, such as dynamic tracking for a task in the surveillance video.

3.2. Motion Video Image Segmentation Technology. In the experiment, the motion video image is recorded by the Sony Pro MCX-500 device. At the same time, in order to obtain more accurate image data, the subject often needs to wear a stereoscopic frame to conduct experiments. By capturing the coordinates of the marker frame, the position and direction of the human body member can be known. According to the obtained coordinate data, the fuzzy clustering algorithm is used to encode and segment the motion video image to correct the image recorded by the Sony Pro MCX-500 device and obtain more accurate image content. Since the motion video images obtained by the Sony Pro MCX-500 device are generally Bitmap (BMP) images, the motion data obtained by the subjects wearing the stereo logo frame is recorded in a text file (txt) with double four digits. The motion data information of each value bar under each frame is recorded. Two different types of data fusion are realized by motion video image coding and segmentation. The implementation step is to use color coding technology to write motion data into BMP image files. The file is called Motion staff, the concept of "spectrum." From the music scores of music, the scores record the scale of the music with notes, and the motion spectrum records the motion data in color; the change of the color provides the information of the intuitive movement change, and the BMP record has the effect of compressing the file, and the color coding will be introduced below. Two motion record formats are with grayscale coding (as shown in Figure 6).

The color coding technology is a motion file for the unconstrained limitation of the rod. First, the double four-digit motion format is converted into the format of the axis angle (θ, s) and the translation (T), and the code is for the θs_x, θs_y, θs_z, T_x, T_y, T_z and the first three are angles. Multiplying the components of the axis to obtain three values of the rotation part (Orientation part), the latter three are the translation part, and the components of each direction *xyz* correspond to the color RGB, color coding technology in the dragon study. In the main part, which is used to perform motion filter point compensation technology, through following the color coding of the design, the purpose is data recording technology. In general, θ ranges from 0 to 2π, but the motion data of different pens has different maximum ranges. Encoding at this range will have the best resolution. However, for better encoding resolution, the range of maximum rotation should be found for each shot since this data is motion without constraints. The color changes consistently, indicating that θ_{S_e} has the same color value change under the same difference, so the maximum difference of all the members is used as the range of encoding. For the rotation term, the angle is from 0 to 2π,

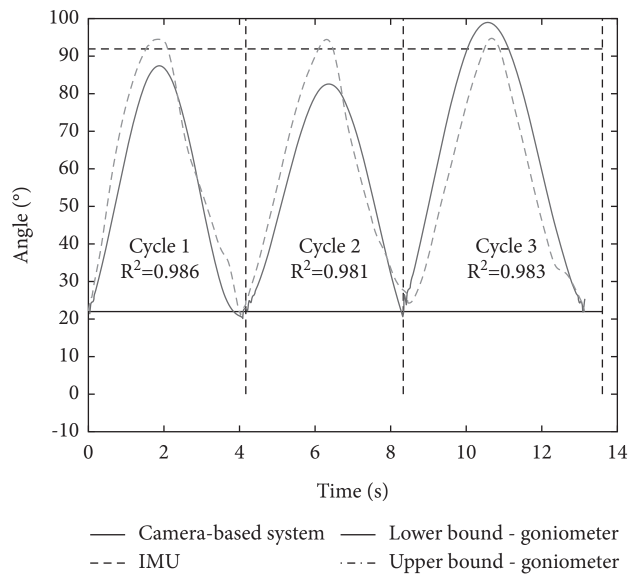

FIGURE 5: In the process of purification, the image should be considered separately according to the red, green and blue color channels.

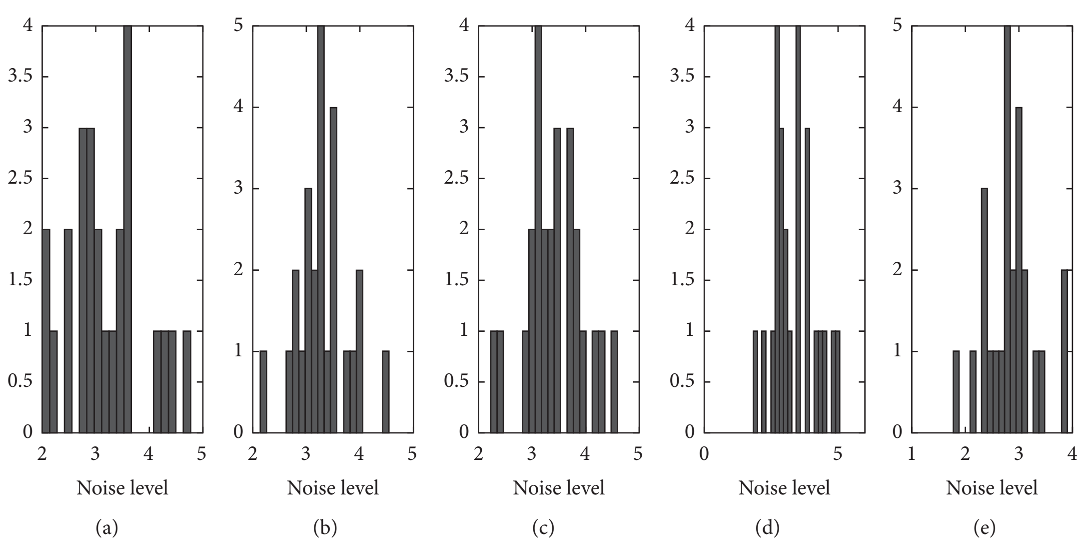

FIGURE 6: The schematic diagram of the algorithm model.

which is specified as 0 and 255 of the color value. The reason is that the rotation axis must be decoded after decoding. Since the two angle values represent the rotation angle for the motion, in the case of pure translation, the axial direction can be either direction. However, there is a problem with the conversion between the axial angular motion format and the four-digit format, and various errors are often apt to occur in the calculation process. In order to avoid this, the axial direction of the two angles will be set to the x-axis $(1, 0, 0)$, and the decoding will be restored according to the color information. Since the translation term does not have a boundary range, the statistical normal segment is used to design the edge code mode, so that the color bar code can display and compare the color distribution and variation of each bar under the same range (as shown in Figure 7).

In addition, since the base member of the human body model is a hip, and the motion is a transformation matrix with respect to world coordinates, the buttocks cannot solve the joint angle with Inverse kinematic (IK) and must be retained after the motion tracking. Regarding the transfer matrix, the motion reproduction can correctly display the relationship between the model and the environment. Therefore, for the grayscale coding of the buttocks, the basic concept of color coding is used to compile six grayscale barcodes belonging to the buttocks, overall, coordinated joint angle and hip motion data. After collecting the motion tracking data, the general motion tracking system will perform the motion fairing process and then continue to use the results for the motion data back-end application. The main function of smooth motion is to denoise and restore real data. Since the collected data may be caused by the

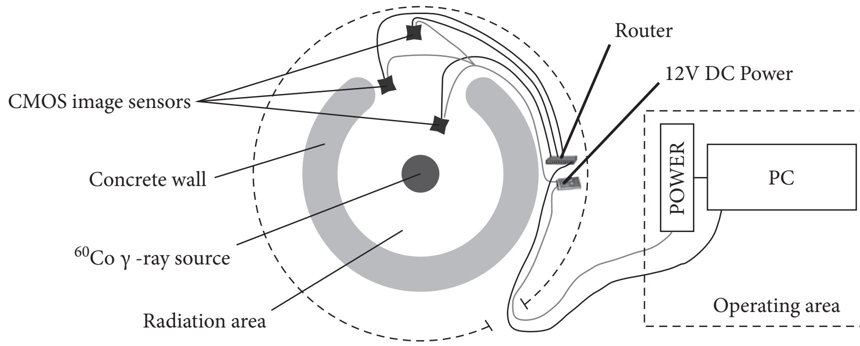

Figure 7: The schematic diagram of the algorithm model.

relationship between hardware systems and high frequency noise, when the motion data is reproduced, it will find that the motion will be jittery. Regarding smoothing technology to remove noise, on the other hand, optical motion tracking system, due to shadowing effects and calculation errors, the rod coordinate system is not correct, and these two problems are called missing marker; in the motion data, there will be a very serious discontinuity, and this part will use the filter point patch technology to restore the real motion. The grayscale coding technique is a motion file for obtaining the joint angle after solving the inverse kinematics. The motion data obtained after the motion tracking is the movement of the rod without restriction, and after the motion filter points are complemented and smoothed, the inverse kinematics is adopted. The solution process can obtain joint angle data; since the joints of the human body have a range of motion limits, and for dynamic analysis, they must conform to the real physical meaning, so the joint angle data is particularly important (as shown in Figure 8).

4. Practical Application

4.1. Experimental Overview. The fuzzy video clustering algorithm and motion video image segmentation technology are used to realize the segmentation of human body model sports video images. Motion segmentation is to analyze the motion data to find the key frames of the segmentation. The motion data can be represented by the motion curve. The segmentation concept will surround the poles of the motion curve, so the motion data must be smoothed; otherwise, the data will be beaten due to noise, and the segmentation result will be affected; the motion segmentation is performed by counting the number of poles of each frame and analyzing the summed curve to determine the key frame candidate group. Finally, the screening mechanism is used to select the most representative key frame from the candidate group. The motion video images in this experiment were recorded using the Sony Pro MCX-500 device to record the subject's movements. At the same time, in order to obtain more accurate image data, the subject often needs to wear a stereoscopic frame to conduct experiments. By capturing the coordinates of the marker frame, the position and direction of the human body member can be known, and then according to the obtained coordinate data uses fuzzy clustering algorithm to realize two different types of data fusion to correct the images recorded by the Sony Pro MCX-500 device and obtain more accurate image content (as shown in Figure 9).

4.2. Experimental Simulation. The purpose of the motion segmentation technique is to find the moment when the motion posture changes. For the sports player, the cutting point of the image motion tends to fall at the pole of the motion curve. In mathematics, the pole on the curve has a slope of zero. Therefore, the pole is also called zero-crossing. The experiment will use Sobel mask for zero-crossing detection, using Sobel mask to calculate the Sobel value calculated for discrete data, Sobel value is calculated by 1×5 mask size, the positive cable the Bell value corresponds to a positive slope, and the negative Sobel value corresponds to the slope of the negative value, so when searching for extreme values, it is more accurate to know whether it is a maximum or a minimum. When the Sobel value is zero, this means that this point is at the extreme value in the discrete data; however, the discrete data does not have a situation where the Sobel value is zero, so the zero-crossing must be performed by the feature of multiplication by less than zero.

However, the size of the mask will affect the number of zero crossings. When the zero-point search is performed with a small mask, the small jitter portion of the curve will be searched, which may be caused by the noise of the motion data, and the noise is filtered by the smoothing technique, so the noise problem has been ruled out; one reason is that the subject is in a static state, because of the small shaking of the body, if the search is too small to cross the zero point, the segment of the motion segmentation will be cut too short due to small shaking, and these zero crossings are not important dividing points for posture conversion. Therefore, the experiment mainly designed an automatic setting mask size to make it suitable for each data.

Due to the motion data of the unconstrained human body model, each member contains 6 pieces of information, which are translation θs_x, θs_y, θs_z and rotation amount T_x, T_y, T_z, respectively. In this experiment, the mannequin has 19 strokes. If the statistics are 19, there will be 114 groups. Regarding data, the method of selecting the frame selection will use the sum of the number of zero crossings of each frame. When the number of frames has a local maximum, the frame will be used as the key frame; However, from the

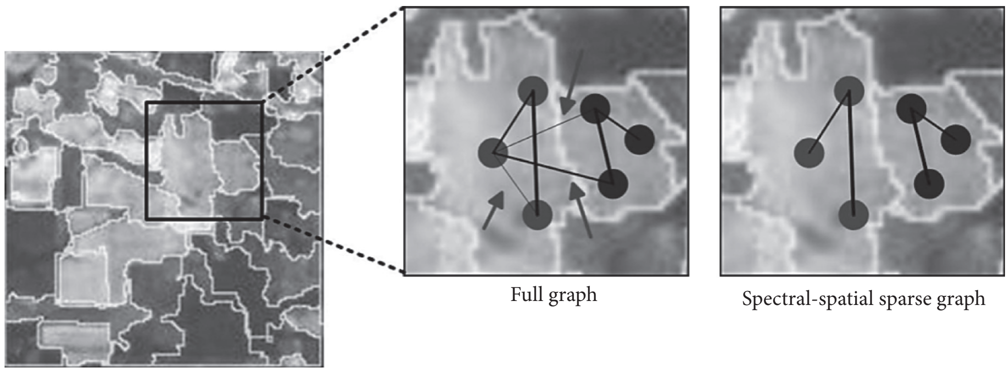

Figure 8: Similarity is measured by the cosine angle between vectors.

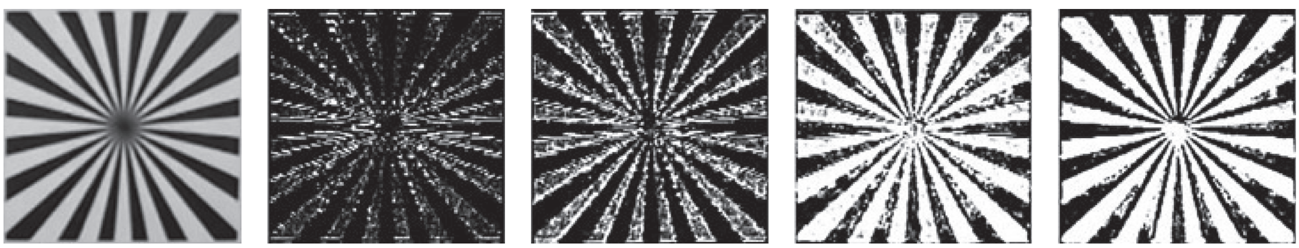

Figure 9: The expert model of building energy intelligent management is applied to the energy management of the building garden. (a) Image before irradiation. (b) 38 Gy/h. (c) 78 Gy/h. (d) 234 Gy/h. (e) 557 Gy/h.

114 groups, it is quite difficult to generate a partial maximum curve, because each rod does not stop at the same time in a certain frame, and a human motion chain may be due to some rods. Some stop or start, so that the number of zero-crossing points is scattered in each frame, so the design is rather unsatisfactory, and using the statistics as the key frame is not good. Therefore, the video image segmentation strategy is divided into hip motion image segmentation strategy and End2Base motion image segmentation strategy. The hip rod is the base rod of the entire human shape, and the motion relationship is relative to the world coordinates, which can represent the position and orientation of the model in the environment. This feature will contribute to the moving image segmentation strategy. In the experiment, the $\theta s_x, \theta s_y, \theta s_z, T_x, T_y, T_z$ six pieces of motion information on the buttocks are detected, and the zero-crossed frames are detected for later analysis. When a performer performs a certain exercise, the limb movement is a content that expresses performance. There are many motion segmentation studies. For the segmentation of the limb movement, only the position of the end-effector is used as the segmentation basis. However, the segmentation does not represent the movement behavior of the entire chain, such as stretching the arm, or rotating the palm of the hand for the performance of the whole arm. For the foot, the underarm, step by step, cannot simply represent the whole chain with the sole of the foot. Therefore, this experiment uses the concept of the benchmark bar of the last bar of a chain as the motion video image segmentation strategy (as shown in Figure 10).

4.3. Experimental Evaluation. After completing the above-mentioned sports video segmentation strategy completion experiment, the RTM model is used to evaluate the experimental effect of the sports video segmentation strategy. The execution steps are as follows: find different evaluation indexes of the evaluated objects and establish an evaluation weight matrix R, calculate the product of each row element of the judgment matrix R, and obtain the actual weight value of the different indicators of the evaluated object, and the weight value of the evaluation score can be calculated by performing calculation with the evaluation content data. The evaluation results can be obtained by calculating the data information recorded during the experiment according to the above calculation method (as shown in Figure 11). The data in the figure shows that the result of the homogeneity test of the image quality obtained by the experimental segmentation is that since the result is much larger than 0.10, it can be inferred that the image quality obtained by the sports video segmentation experiment has reached the SROCC standard.

By capturing the coordinates of the marker frame, we can know the position and direction of human members according to the obtained coordinate data. Fuzzy clustering algorithm is used to realize two different types of data fusion to correct the images recorded by Sony Pro mcx-500 equipment, so as to obtain more accurate image content. After completing the experiment according to the above sports video segmentation strategy, the RTM model is used to evaluate the experimental results of sports video segmentation strategy. The evaluation results show that the

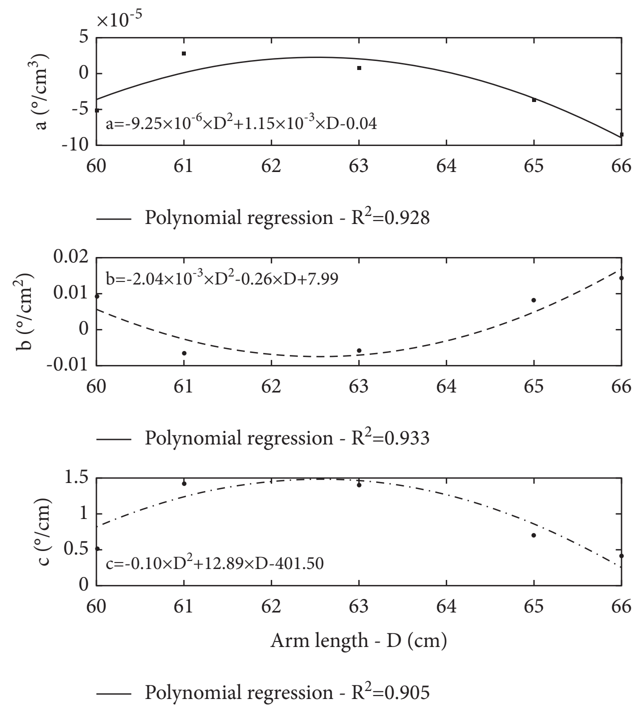

Figure 10: Actively issue abnormal energy consumption and alert to reduce wrong energy consumption.

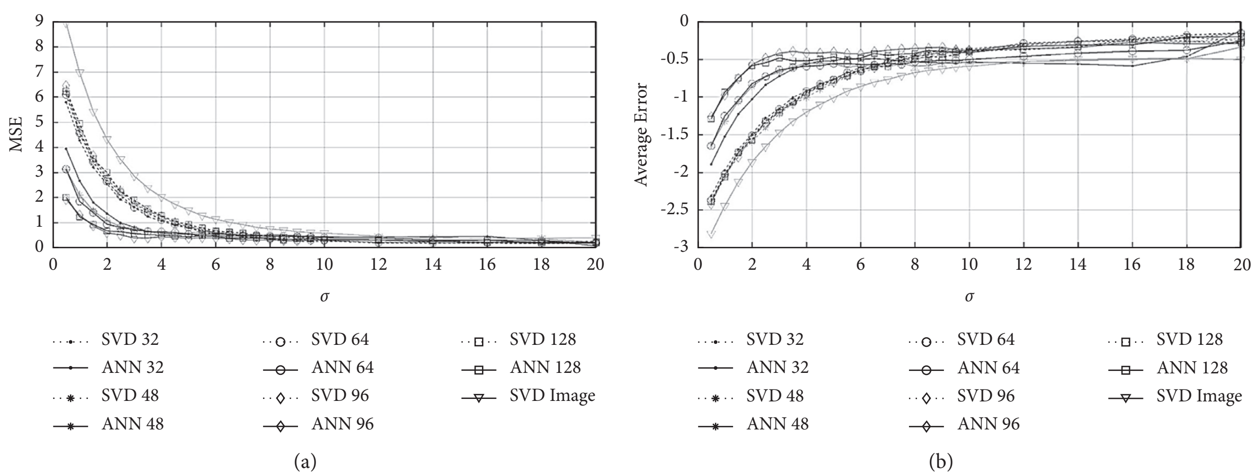

Figure 11: Precision instrument of watt-hour meter tester with fault in transmission system.

image quality homogeneity test result obtained by the experimental segmentation of the above design is that because the result is far greater than 0.10, it can be inferred that the image quality obtained by the sports video segmentation experiment meets the SROCC standard.

5. Conclusion

The fuzzy clustering algorithm and motion video image segmentation technology will be used to realize the segmentation of human body model sports video images. Motion segmentation is to analyze the motion data to find the key frames of the segmentation. The motion data can be represented by the motion curve. The segmentation concept will surround the poles of the motion curve, so the motion data must be smoothed; otherwise, the data are beaten due to noise, and the segmentation result is affected. The motion segmentation counts the number of poles of each frame, analyzing the summed curve to determine the key frame candidate group and finally using the screening mechanism. The most representative key frame is selected from the candidate group. The experiment uses Sobel mask for zero-crossing detection, using Sobel mask to calculate the Sobel value calculated by discrete data, and using hip motion image segmentation strategy and End2Base motion image segmentation strategy combined with motion video. The image segmentation technology implements segmentation of the human body model sports video image recorded by the Sony Pro MCX-500 device on the subject's motion process. In order to obtain more accurate image data, the subject often needs to wear a stereoscopic frame to conduct experiments. By capturing the coordinates of the marker frame, the position and direction of the human body member can be known according to the obtained coordinate data. The fuzzy clustering algorithm is used to implement two different types of data fusion to correct the images recorded by the Sony Pro MCX-500 device, so as to obtain more accurate image content. After the experiment is completed according to the above sports video segmentation strategy, the RTM model is used to evaluate the experimental results of the sports video segmentation strategy. The evaluation results show that the result of the homogeneity test of the image quality obtained by the experimental segmentation of the above design is that since the result is much larger than 0.10, it can be inferred that the image quality obtained by the sports video segmentation experiment has reached the SROCC standard. Unfortunately, the fuzzy clustering algorithm and motion video image segmentation technology used in the experiment still have certain defects, which is not conducive to the popularization and application of this technology. Therefore, in the future research, the defects in this aspect will be improved.

Data Availability

The experimental data used to support the findings of this study are available from the corresponding author upon request.

Conflicts of Interest

The authors declare that they have no conflicts of interest regarding this work.

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