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Study of Object Segmentation Motion in Dynamic Lookup Scene Video

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Abstract: With the rapid development of computer technology, motion analysis of video has become a hot research topic in the field of computer vision based on. As the core technology and the underlying problems of visual analysis of moving objects, moving objects in video from a dynamic scene segmentation is very important, it is the subsequent high-level processing, such as moving object tracking, object classification and activity recognition, event detection based high level video processing and application of understanding. The paper introduces the segmentation technology to monitor the video in multimedia, video object, application and research situation of sports analysis and other fields, and discussed the significance and application of the high speed development of the information age, the development situation of domestic and foreign video segmentation techniques are reviewed, including spatial intra-frame segmentation, global motion estimation, a few hand joint space-time segmentation discussed video segmentation method, and according to the characteristics of diving video sequences, to study how to extract moving objects from a dynamic scene problem. On this basis, the video object extraction method used in diving and gymnastics videos.

Keywords: Image processing, Data structure, Algorithm, Topography, Diving.

1. Introduction

All along, China's diving level are in a leading position in the world, this is mainly because we have a team of experienced coaches with talent and hard training athletes [1]. However, in recent years, China's diving supremacy has been severely shaken, like Canada, the United States and Australia these. The show in the level of the diving competition on China's diving athletes won the gold medal at the target to have the huge impact, the main reason for this phenomenon is because our country athletics sports scientific research is still relatively backward, the use of science and technology in the diving training almost zero [2].

Different diving movement and human walking gait and ball games and other sports, when people walk, mainly arm [3]. Leg and ankle local multiple degrees of freedom motion, the whole body is mainly for translational motion; sports games mainly relates to run, bouncing movement, its nature and human gait has many similar place, only faster; while diving is the whole body roll motion in the air, accompanied by the arm, leg and ankle motion, do empty tumbling athletes to complete the flight, in a very short period of time reversal, flexion, extension, finally tuck,

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drowning or landing and a series of actions. To solve this problem, the diving movement as the object of study, carried out by human flight tumbling movements to characterize the diving motion tracking and analysis technology research, through the video camera to acquire the sport of diving in a particular environment, and tracking, 3D human motion model. Starting from the physiological characteristics and the biomechanics of human, motion parameters of joints in all parts of the human body diving movement in the process of the calculation model and method, put forward in the given a state of motion of each joint point reverse motion parameters and initial state parameters of the algorithm, thus solving for various intermediate state parameter and initial state parameters the athletes to achieve the best performance needs, and help athletes [4-7].

From the existing literature situation, relative to other applications, research in motion analysis is less directly facing the sports, and in these applications, the video content retrieval, classification, tracking event detection [8]. Chinese Academy of Sciences Institute of computing technology development for sports training simulation and video 3D human motion analysis system should be a function of the applied field of more comprehensive sports video technology more advanced analysis system [9-11]. Of course, the system also needs to further enhance and improve, in order to achieve the practical level of higher. Visual analysis of human motion is motion in image sequences for the analysis and processing, relating to the processing and analysis, image, computer vision, pattern recognition, artificial intelligence, computer graphics, mathematics, such as the human body kinematics multidisciplinary areas of knowledge and technology, its process includes video segmentation and extraction of motion, constructing the three-dimensional motion human body model, joint dynamic trajectory tracking, motion parameter equation and parameter calculation, model in reverse and video animation reproduction etc [12].

In view of segmentation techniques in pattern recognition of the video object, importance and urgency of field application and video multimedia standard analysis, this paper takes it as the research subject, key video object extraction diving test sequences, auxiliary in the gymnastics test video [13]. Aim of this work, to explore an effective, as far as possible, general video segmentation method for reference, with a view to the whole project pad set a solid foundation. Considering the specific requirements of the real-time and accurate video segmentation and project, this paper from the following three aspects: analysis and research of video object segmentation based on dynamic scene, clustering method to study the image and not rule matching algorithm of image blocks, will be presented in this paper based on the local graph irregular block matching video segmentation methods are often used with the previous based on the comparison of background subtraction method for motion estimation for video segmentation [14-17].

2. The Current Domestic and International Research Status of Video Segmentation

2.1. Video Object Segmentation Based on Spatial Feature

Video is composed of image sequence with a certain length, each frame of the video (sampling one time) can be regarded as an image. The image is usually content in the time domain coherence. Therefore, image segmentation is the basis of video segmentation. At present in the image segmentation of stationary objects is difficult, it is more feasible, using motion information in a dynamic scene segmentation of moving objects in video motion segmentation [18].

The purpose of video segmentation is to put the moving objects in the scene with the same background partition [19]. Each part of the same objects tends to have the same features, spatial characteristics and temporal characteristics [20]. This is the physical basis of all video motion object segmentation algorithm. The main spatial characteristic is the brightness, color, texture or other transformations, such as the gradient image, co-occurrence matrix, such as histogram. There are two different viewpoint: regional (consistent focus on spatial features) and edge (differences focus on spatial features), timing characteristics (i.e. motion attributes) mainly for the frame difference, optical flow field, which can detect the frame change region, direction and size and movement [21].

In recent years, the video object segmentation is a hot issue in academic research. The United States of America Microsoft Asia Research Institute in video object segmentation T to do quite a lot of work, put forward to realize the automatic object segmentation using multiple frames and multiple features. But because of video segmentation is difficult, they will simplify the problem, the research is limited in stationary or moving background is very small under the condition of target segmentation [22]. At the same time, also put forward the segmentation method of manual intervention semi-automatic object, and achieved good results. The United States of America's other research institutions such as the Sarnoff-laboratory, Columbia University in video object segmentation, retrieval has also done a lot of research.

Spatial video object segmentation method based on color information, using spatial features in video image to segment the object, this method can get the precise edge objects from images. But if the image was segmented reference only spatial information, the result is the area of the image collection, these areas do not have complete semantic video object,

they are only a part of the. The different consideration of image based on spatial feature, spatial video object segmentation method based on the image color information can be divided into the following categories: method based on edge detection, region based approach, as well as the method of artificial intelligence.

2.2. The Segmentation Method Based on Edge Detection

Physical edges provide important visual information, it is with the image gray scale change in discontinuities linked, so often use function of the image gray scale change in the definition of edge model. The gray change type is most often used as a step function, in a real image, the ideal step changes due to the influence of noise and not so obvious. In the image processing process, the extreme points of zero step edges are positioned on a derivative or two derivatives. Calculated using gradient derivative in the image, the two derivative Laplace operator is the common edge detection operators have a gradient operator, Laplace operator, Gauss-Laplasse operator and Canny operator. If the image is a two-dimensional, the function I (x, y) digital sampling, image gradient is shown as follow:

$$I(x,y) = [Gx, Gy]^T = \left[\frac{\partial I}{\partial x} - \frac{\partial I}{\partial y}\right]^T \quad (1)$$

In the edge detection, often using the gradient, the partial derivative of each pixel location calculation I = |Gx|+|Gy|, the actual area in common template convolution approximation. According to the template size and value of different elements, people have proposed many different operators. The more commonly used are Sobel operator and Prewitt operator, the main detecting horizontal and vertical edges. The Sobel operator provides better performance and is not sensitive to noise, is the most commonly used gradient operator in edge detection. The above gradient operator is the gradient image, as the intensity information of the edge, the use of two values, boundary tracking, Laplace edge detection, can get the pixels on the edge. Laplace edge detection operator is estimated two order differential operator output zero position. Laplace estimation is given by:

$$I(x,y) = I(x,y) - [I(x,y-+1) + I(x,y-1) + I(x+1,y) \; I(x-1,y)]/4 \quad (2)$$

As the two order derivatives of Laplace operators with sensitivity, unable to accept of noise, often in the image small changes in regional produce false edges, generally not used for edge detection in its original form. In order to reduce the influence of noise, can treat the detection of image smoothing and then use the operator. With a smooth function of normal distribution (Gauss function):

$$h(r) = exp\left(-\frac{r^2}{2\sigma^2}\right), \quad (3)$$

$$r^2 = x^2 + y^2 \ , \quad (4)$$

σ is the Gauss distribution of standard deviation. Image smoothing and then using the Laplace operator, Laplace operator is equivalent to the convolution of the original image using the Gauss function h:

$$\nabla^2 h(r) = \left[\frac{r^2 - \sigma^2}{\sigma^4}\right] exp\left(-\frac{r^2}{\sigma^2}\right) \quad (5)$$

The formula is usually called Gauss-Laplasse operator, due to its smoothness properties can significantly reduce the influence of noise, so, when the edge blur and noise, detection can provide a reliable zero edge position by the operator. In LoG operator, the choice is very important, more hours of high position accuracy but the edge details change. Mathematics has been proved and the LoG operator is the best operator by zero-crossing detection step edge.

Methods discussed above only in the pixels on the edge. In fact, due to noise, non-uniform illumination and the discontinuity and other effects of brightness due to introduce a false break, get a group of pixels is rarely complete picture of an edge. Therefore, the typical approach is to use the connection process will be combined into meaningful edge pixels in edge detection. Method of edge connected with neighborhood edge searching method, curve fitting, Hough transform, through the graph technology for the global processing. Canny for the first time the index in mathematical form, and then by using optimization method, the optimal edge detector corresponds to the step edge, practical application, a derivative of Gauss function can efficiently approximate. Two-dimensional Gaussian function was shown as follows:

$$G(x,y) = \frac{1}{2\pi\sigma^2} exp\left(-\frac{x^2 + y^2}{2\sigma^2}\right) \quad (6)$$

2.3. The Segmentation Method Based on Region

Segmentation method based on target is the use of image features, the image of single pixel mapping into an area known as the set of pixels. Usually, area is considered as a two-dimensional surface. Region can also is not connected, not simply connected (hole), or there should be a smooth boundary. The purpose of all this with the region segmentation and, finally, the whole image is divided into separation area is normally region segmentation purposes,

namely: no two overlapping region between the internal elements, without any pixel belongs to two or more areas. However, there is no single definition of a relevant area) they may also allow overlapping, or the whole image can't be divided. Effectiveness largely region segmentation algorithm depends on the application domain and the input image. If the image is very simple, like a black regiment on a bright background, the local method is simple and can get very satisfactory results. On the contrary, in very complex scenes, such as outdoor scene, even the most advanced methods cannot obtain satisfactory segmentation. In this case, region segmentation as a kind of image preprocessing method, more knowledge and ability of the next step needed for processing.

Deng after the seed region were determined, using global optimization rules for regional growth, and then use the merge threshold image segmentation based on the area. Haris K. uses the watershed segmentation algorithm to complete the initial segmentation image, then color distance most similar regions are merged using fast region merging algorithm, when the image in the region to set the number of stops with. The watershed segmentation algorithm is a good image, its image (or gradient map) for 3D visualization based. Two of them are coordinate, another is the gray level. For such a topographical interpretation, consider three points:

1) Belongs to a local minimum point;

2) When a drop of water on a point location, water will fall into a single minimum value points; 3) When the water at a point position when the water flow, such as the probability of more than one such minimum point.

For a specific area minimum, satisfy the condition (2) the set of points called minimum / poly water basin, satisfy the condition (3) sets the peak point line of terrain surface, called the watershed. There are a lot of watershed algorithms, a typical method is based on the idea of immersion simulation. Suppose one hole in each regional minimum position, and let the water at a uniform rate of rise of the emission from the cave, from low to high inundation of the terrain. When in the different water basin of water will be together, the dam will prevent the polymerization, water will only reach the top in the water above the dam. The dam will correspond to divide, and poly basin corresponding segmentation region "the traditional watershed algorithm is proposed by Vincent in 1991, mainly by sorting and submerged consists of two steps. In the sorting step, mainly to complete the image gray level distribution in frequency calculation, the sort of gray level according to the calculation results, then the memory array for each pixel in the image and its distribution to the gray level corresponding to. In the flooding process, the use of FIFO queue calculation area of influence, through recursive algorithm to achieve the continuous expansion of water basin, finally complete the image segmentation.

2.4. Segmentation Method of Artificial Intelligence

Methods based on artificial intelligence refers to the use of the intelligent simulation the method of video image segmentation, such as neural networks, fractal technique, information fusion, Markov random field model, fuzzy theory in the good results achieved in the field of video image segmentation. For example, fuzzy theory provides a mechanism for image segmentation, can express and operation of this uncertainty, and this uncertainty is not random. The output image segmentation should be fuzzy subset, wherein each pixel belonging to a region or a certain degree of edge, to express by the home value. Fuzzy set theory can be regarded as a mathematical tool, it and other segmentation methods used in combination can be flexibly applied to different color space, image segmentation.

For some applications, detection in video image sequence difference of adjacent two frame images is very important in video processing steps. Any perceptible motion in the scene are reflected in the change of scene images, such as can detect this change, we can analyze the motion characteristics. If the objects motion of in parallel the image plane, good estimation can get the motion characteristics of quantitative parameters. Many techniques of dynamic scene analysis of image sequences are based on change detection. Temporal segmentation based only on the motion information in video sequence segmentation of moving object with common method flow method and change detection method.

Segmentation using motion information, first is to estimate density field, and then according to the segmentation of the scene motion information. Optical flow method based segmentation is by means of the optical flow field, from video sequences approximate motion field calculation can't be obtained directly, and then according to the motion characteristics of the motion field segmentation. But when using the optical flow method, motion estimation of the occlusion problem and the aperture problem, which could not be established, the occlusion problem refers to the corresponding background pixel covered or exposed; aperture problem refers to the number of unknown quantity is greater than the known quantity. And the optical flow is caused by the image brightness changes with time, so the scene light changes will cause changes in image brightness values, sometimes will cause larger changes, so the optical flow field and does not correspond to the athletic field, therefore, need to simulate 2D motion field structure to the assumptions of the model additional, to the unique solution is obtained.

The biggest advantage of background elimination method is simple in calculation, fast speed, but in order to more accurately on the background modeling, this method is generally assumed to video camera to capture video sequence is stationary. It puts forward the background model is more complex

to handle background illumination and shadow etc. For example, each pixel is represented with static background within a period of time in the color distribution, Gauss distribution model. However, when the camera is moving, namely background has the quick change, this kind of method can not accurately for background modeling, which leads to the background elimination of failure. When the image spatial gradient, the movement of objects, it can be reflected in the image sequence time gradient. Therefore, based on the two frame image with certain time interval calculation difference sequence frame difference method (equivalent to the time gradient), then according to the range of motion differential output to determine the target.

3. Result and Discussion

3.1. Global Motion Estimation

Video is composed of a frame image, between the image frames are not independent of each other and they have the time. Video object segmentation is to use the texture information of image frames inside, also make full use of time domain characteristics among the frames. From the current domestic and foreign video segmentation method to study the status quo can be seen, spatio-temporal video object segmentation method due to its use of temporal information between video sequence images, and use of the single frame image spatial information inside, it is better than other two kinds of video segmentation method has better segmentation effect. As shown in Fig. 1, the camera of 3D space (X, Y, Z) is mapped to the 2D space plane point (X, Y).

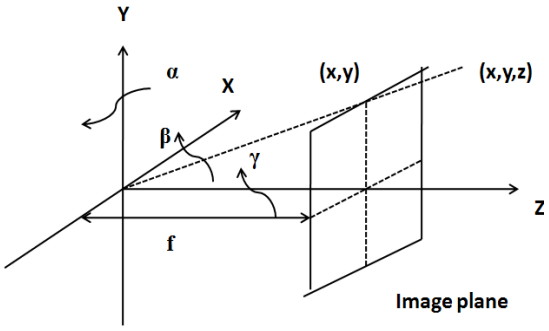

Fig. 1. The motion of the camera imaging model.

The research of video object segmentation based on spatio-temporal segmentation framework is on, at the same time temporal segmentation and spatial segmentation of the video image sequence. In order to determine the approximate location of the video object segmentation, accurate determination of the edges of video objects through the airspace division was carried out. Spatial segmentation accuracy determines the final video object boundary accuracy. Therefore, the temporal segmentation and spatial segmentation is an indispensable important link, this paper research on Algorithm of this, Moto Akimatsu elaborated on the basic theory of time domain global motion estimation.

Let (X, Y, Z) and (X', Y', Z') were an object points in the two adjacent frames in the three-dimensional coordinate. If the object motion in a 3D scene to displacement, rotation and linear change, then (X, Y, Z) and (X', Y', Z') in relation to:

$$\begin{bmatrix} X' \\ Y' \\ Z' \end{bmatrix} = \begin{bmatrix} s11 & s12 & s13 \\ s21 & s22 & s23 \\ s31 & s32 & s33 \end{bmatrix} \begin{bmatrix} X \\ Y \\ Z \end{bmatrix} + \begin{bmatrix} t1 \\ t2 \\ t3 \end{bmatrix} \quad (7)$$

3.2. The Camera Global Motion Parameter Model

Block matching motion estimation method is used, the idea is to divide an image into many non-overlapping sub-image blocks, and that the displacement amplitude of all pixels in the blocks are the same, which means that each sub-block are regarded as moving objects. For the k a 1 frame image sub-block, look for the most similar blocks in K frame image, this process is called to find the matching block, and that the matching block in the K frame in the position of the K is a 1 frame block displacement position, the change of position can use the motion vector to express. Block matching motion estimation algorithm according to the different search strategies, divided into two categories, one is the full search block matching algorithm, a fast search block matching algorithm.

Full search block matching algorithm is the basic idea of the block select a size of n*n in the current Fig. 2 in the previous frame search area (the search region defining a maximum displacement P, two direction because of the continuous image sequence can be assumed the relative motion between two frames is very small), using a matching criterion is the best match, so as to obtain the relative motion vector optimization. Generally speaking, the selection principle of the current block frame is to center, because an image is usually located in the center / focus. The choice of search region also makes the positioned in the centre of the current frame n*n block, the purpose is to guarantee to obtain the global optimal motion vector.

Because of this algorithm is simple, effective, still in use by many people. The three step search algorithm follows from coarse to fine, stepwise refinement principles to find the best motion vector. The execution process of the algorithm can be divided into the following steps:

The Step l: First choose an initial step size W. In W/2 steps, test centered on the origin of eight points;

The Step 2: With minimal matching error point as the center, step binary, test the new eight;

The Step 3: Repeated Step 2 motion vector at.

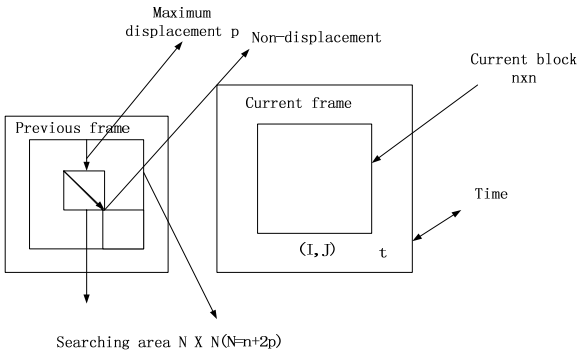

Fig. 2. Full search block matching algorithm.

As the displacement of objects in video sequences generated in the frames are not exactly integer pixels, used to describe the fractional pixel accuracy motion vector will be more accurate, but will increase the amount of calculation. Schematic diagram of the three step search algorithm was shown in Figure 3.

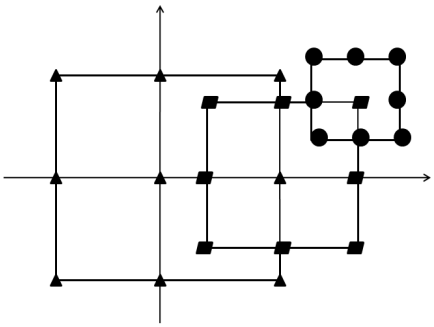

Fig. 3. Schematic diagram of the three step search algorithm.

It has been proved that, compared with the integer pixel search, half pixel search in motion estimation is greatly improved accuracy, especially for low resolution video. Motion estimation shows that the statistical analysis of the relationship between error and the search accuracy. When the noise is low, need not be larger than 1/8 pixel accuracy, while in high noise environment, 1/2 pixel accuracy is enough.

In this paper, characteristics of the temporal aspects of video sequence are introduced in detail, the parameters of the moving camera models are introduced for video sequences present global motion; the most commonly used block matching motion estimation are two kinds of typical search method, and on this basis, put forward a method without backtracking search block matching motion estimation algorithm based on. Experiments show that, the algorithm can guarantee the search accuracy of the premise, greatly reduce the number of search points.

3.3. Principle and Technology of Block Matching Motion Estimation

One uncertainty is difficult to solve the problem of image segmentation as video segmentation based on its own is the computer vision and image processing fields. The existing video segmentation algorithm is the most specific problems, there is no uniform. General theory and method according to the specific application, for diving, gymnastics movement characteristics of video, this paper presents a local graph irregular block matching video segmentation method based on the proposed method, which is based mainly on the diving, gymnastics video players dress is simple, characteristics of naked skins. According to this characteristic, if the video object is diving, gymnastics video players graph data structure for storing words, can be divided into several connected components, using the method of irregular block matching based on the segmentation results on a frame in the next frame for the foreground region can reduce the amount of computation, improve accuracy and timeliness segmentation.

Local graph irregular block matching video segmentation method based on (LGIBM), an area about the prospect of a priori knowledge of human skin to determine the distribution of the first frame of the image on the background, compared to the single threshold segmentation can be obtained. If the first frame of image background rich, complex scenes, is necessary for interactive segmentation through first frame to obtain the accurate foreground. According to the continuity of video frames, the global motion estimation, the first frame of the position of foreground, can determine the second frame of the region of interest (ROI), and a previous frame of the prospects for the irregular block matching in a frame. Process of LGIBM algorithm was shown in Fig. 4.

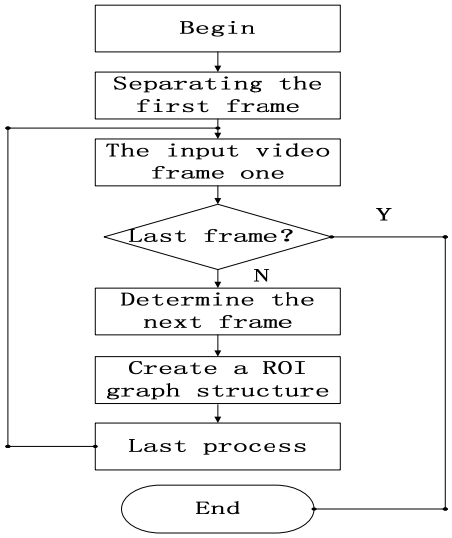

Fig. 4. Process of LGIBM algorithm.

In this paper, with the six parameters affine model of camera motion caused by modelling scene change frames. When the relative depth of objects in the scene changes and camera zoom range is not big, six parameters affine model can well describe the pure rotational camera lens! Shake and displacement, and most of the indoor or outdoor video shot can satisfy the above conditions. Although the eight parameters perspective model can better describe the camera motion, but its computational complexity with respect to affine model even more, but if the superposition of the camera motion parameters between consecutive frames, the cumulative errors caused by the more serious. Based on the above reasons, global motion in this thesis is estimated using six parameters affine model". Using feature point for global motion parameters corresponding method, the search algorithm using NBT can reduce the search time, improve search accuracy. After determining, the two frame before and after matching points, then the differential method for solving the global motion parameters.

For complex scene first video frame, using manually labeled ROI. The simple scene video can be based on the image segmentation results, determined by its edge. Calculation is given in Fig. 5 after global motion compensation frame diagram, according to the frame difference to obtain the approximate front to determine the ROI view profile area, Fig. 6 white rectangular label is ROI.

Fig. 5. First frame.

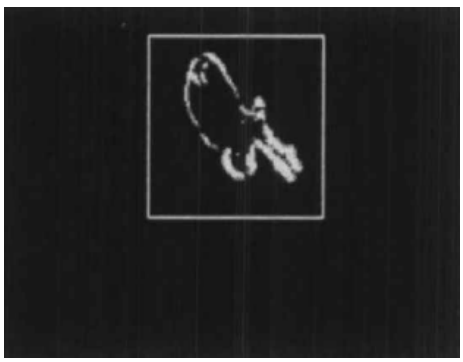

Fig. 6. The frame before the current frame and the frame difference after compensation.

This chapter focuses on video foreground object is simple which is a kind of existence of global motion video, such as diving, gymnastics videos athletes often naked skins, dress is single, a video segmentation method locally irregular graphs based on block matching. The storage structure of ROI image in the graph can be divided into several motion foreground connected component, according to the prospects of a frame of the block, the block matching method of irregular found in the current frame foreground image block. The global motion estimation and compensation, the two adjacent frame difference, can locate ROI and the global motion estimation is located approximately parameters for ROI, avoiding the previous methods rely on global motion parameters accurately the segmentation inaccurate phenomenon.

3.4. Local Graph Irregular Block Matching Video Based on Segmentation Method

Because the image is stored in the form, then the foreground segmentation obtained may consist of several connected components. The sport of diving videos, in general, generally can be divided into head, bare skin and dress the body of three parts. Irregular block matching is according to the results of previous frame segmentation in the next frame within a specified ROI looking for matching block. This is also the similarity comparison problem, traditional similarity metric rules, absolute difference, mean absolute difference, variance, mean square difference, product correlation and normalized product correlation similarity measure, the first four minimum similarity measure, while Prod and Nprod for the maximum similarity measure. In general, the last segmentation of a part of the foreground region is connected component record corresponding to the variable x.

K-L transform (PCA method) can be used to the representation of face images. For an image in the computer with the f (x, y), X and Y represent the spatial coordinate here, and at any point (x, y) on the F value is proportional to the brightness of the image at the point (grayscale). In a computer, the image f (x, y) in coordinate space and brightness have been discretized. Can take a digital image as a matrix or an array, use B (I, J) said. The row and column marked a point on the image, and the corresponding elements in the matrix, the value of the gray level of the points. Digital array of such elements is called picture elements or pixels. The PCA method is fast and simple and has been widely applied in practice. For a size of m x n face image, its each column connected to form a size for the column vector of D = m x n dimension, where D is the dimension of the face image. Let M be the number of training samples, X_j is face vector, the covariance matrix of all the training samples for:

$$S = \sum_{j=1}^{M} (X_j - u)(X_j - u)^T, \quad (8)$$

where u represents the average image vector of training samples:

$$u = \frac{1}{M} \sum_{j=1}^{M} X_j \quad (9)$$

4. Experiment Result Analysis

In order to test the validity of the algorithm proposed in this paper, several kinds of diving and gymnastics video sequences were tested, this paper named Diving l, in accordance with the order of Diving 2, Diving 3, Diving 4 and Gymnastics video sequences, respectively, represent the four diving video sequences and a gymnastics video sequence. The five video sequences are global motion, experiments were carried out in PC memory, the size of the image sequence is 352X240. Each frame of each step of the algorithm the average processing time is given in Table 1.

Table 1. The average processing time for each step of the algorithm (ms).

Video sequence	Plans to create	Motion estimation	Irregular block matching	Total
Diving 1	352	363	231	947
Diving 1	340	342	213	895
Diving 1	223	365	157	745
Diving 1	351	352	253	956
Gymnastic	475	289	321	1085

The first column is the original sequence, second columns and after image partition corresponding to each image in the first column, a blue rectangular mark the middle area is ROI, third as after two value objects after the first extraction of video sequence frames is more complex, the time to deal with the video, taken the first frame of manual segmentation way to get prospects. Diving 2 and Diving 4 video sequence, scene is relatively simple, but the two video moving fast, change between frames, time for motion estimation, the search scope enlarged some. In Diving 3 video sequences, the diver take-off stage, background for the sky, at the first frame of foreground segmentation can be extracted directly from the image segmentation results. Go into the water phase of the complexity of the scene, the segmentation result with error. Gymnastics video sequence as a balance beam motion video, the video camera motion is relatively small, therefore, it is the five time the motion estimation of video in the least, but due to the complexity of the scene, image segmentation and irregular block matching the time spent is the five most but overall see, the five test video average processing times per frame are in about 1 seconds, the user can achieve the real-time requirements.

We can see from the experimental results, presented in this paper based on the local graph irregular block matching video segmentation method can effectively extract moving objects from diving, gymnastics and other video. This method was used to extract video object in the relatively simple, such as diving, gymnastics video sequence athletes often naked skins, dress is single. The method proposed in this paper for other dynamic scene video, if the moving object is numerous and complex textures, such as from the football! Players basketball video segmentation, must first manual segmentation of the first frame of the future, which is very complex, not to reach the purpose of real-time segmentation. Further research will explore the solution of combining learning based method and the method proposed in this paper.

5. Conclusions

This paper studies the problem of dynamic scene video segmentation, expounds the important significance and practical application. Segmentation of dynamic scenes from the video, image segmentation and motion estimation are discussed in detail, and discusses a segmentation method of temporal video in diving video sequences. At the same time, with the analysis of numerous experimental results are given, and the method proposed in this paper and the previous methods often used for global motion estimation based on the comparison, points out their advantages and disadvantages. Based on the review and analysis of relevant research, the research on segmentation in dynamic scene video was carried out.

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