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Research Article

Application Research of Partial Differential Equation Optimization Image Analysis in National Traditional Physical Education Teaching

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In this paper, the initial parameters of C-V level set image recognition are optimized by using the global optimization characteristics of cultural algorithm, and a cultural algorithm C-V level set image recognition model is proposed, which is abbreviated as the CC-V model. The initial population space of the cultural algorithm is used to set the initial recognition parameters in a large range, and the population evolution is continuously optimized and guided by the situation knowledge and normative knowledge of the reliability space, so as to realize the global optimization of the recognition parameters and to timely terminate by judging the change of the image entropy fitness value. Through the analysis and comparison of the experimental results, the CC-V model has a better recognition effect than the C–V model. The partial differential equation image recognition model is applied to the video image sequence for moving target recognition. The background model is constructed by the block statistical histogram. The background difference method is used to locate the video moving target, and the minimum circumscribed rectangle of the multitarget positioning is used as the initial outline of the model recognition. The research results show that the nonintellectual factors of each group of ethnic traditional sports have an obvious effect on the application value of people, and the application effect of nonintellectual factors produced by different groups will also vary. All ethnic traditional sports groups show higher application value to nonintellectual character factors. The comprehensive application value of nonintelligence factors of the combat confrontation item group, accuracy item group, and endurance item group is relatively higher than the comprehensive application value of nonintelligence factors of other item groups.

1. Introduction

The strategy of rejuvenating the country through science and education has long been known to the people: Strong education leads to a strong country. The colleges and universities known as "ivory towers" have already developed into multilevel, multicategory, and fully functional educational and scientific research bases [1]. However, a strong body is the body of the mind and the carrier of innovation, so college sports should take on the burden of strengthening the body and revitalizing the nation. The innovation of education cannot be delayed. The introduction of national traditional sports with a high fitness value and strong entertainment in college sports to enrich the teaching content can not only achieve the purpose of promoting national traditional culture but also play the function of strengthening the body and entertaining the body and mind [2]. According to their own characteristics and regional characteristics, colleges and universities selectively introduce traditional national sports items and incorporate them into physical education teaching. On the premise of enriching teaching content, the problem of homogenization of teaching materials is improved to achieve the purpose of diversifying school-based teaching materials [3]. It not only promotes the national culture but also broadens the knowledge of college students and improves the knowledge

structure of college students and the physical quality of college students. At the same time, it can also stimulate the spirit of unity and cooperation among students of all ethnic groups and achieve the role of promoting national unity and common prosperity.

Fractional partial differential equations can be used to describe a variety of motions, such as turbulence, quantum chaos, image processing, and the flow of underground sewage [4]. In many practical applications, the solution of fractional partial differential equations is the research focus, including the research of analytical solution and numerical solution, respectively. The analytical and numerical solutions of simple fractional partial differential equations are easy to find, but the analytical solutions of more complex fractional partial differential equations are complicated and difficult to solve, which brings a lot of troubles to practical applications [5]. Therefore, the focus of research on fractional partial differential equations is to quickly find numerical solutions. A lot of research works have been carried out on the fast solution of fractional partial differential equations, and some of them have laid a solid foundation for later researchers to study the fast methods of fractional partial differential equations (6) and (7).

This paper takes the widely used level set image recognition algorithm as the core and analyzes the region-based active contour model and the edge-based active contour model. As a simplification of the M-S model, the C-V level set model has a good ability to adapt to the change of the topological structure of the image area. The C-V model is a region-based active contour model. The numerical implementation uses the regularized Heaviside function to achieve the stability of the active contour in the identification process of the energy functional. When the initial parameters are set reasonably, the identification results are better. This paper uses the global optimization characteristics of the cultural algorithm and simplifies the parameter setting problem of recognition on the basis of the C-V model and proposes the CC-V model. Through the analysis and comparison of the experimental results, it shows that the CC-V model has a better recognition effect. Since the C–V model is a region-based recognition model, it has more advantages in dealing with the recognition of traditional national sports images. The CC-V model is based on the C-V model and has the ability to recognize noisy images.

National traditional sports items have high application value to people's nonintelligence, and different item groups have different effects on the corresponding nonintelligence subfactors. There is a certain similarity in the application value of nonintelligence factors. Through the in-depth discussion of ethnic traditional sports and injecting non-intelligence factors into the perspective of studying the influence of different groups on nonintelligence factors, it can provide effective theoretical guidance for front-line coaches and teachers in colleges and universities and promote the comprehensive, coordinated, and healthy development of ethnic traditional sports development, and effectively drive the sustainable and harmonious development of the profession.

2. Related Work

From the current research, although the coefficient matrix of the linear system obtained by discrete fractional partial differential equation has a Toeplitz-like structure, the system is serial [8]. The so-called serial means that the numerical solutions of each time layer in the system are interdependent. For example, when seeking the solution of the current time layer, the numerical solution of the previous time layer must be calculated, which means that the solutions of all time layers must be obtained. The solution for each time horizon is to be calculated sequentially. Most of the current algorithm research studies adopt the serial solution method, but the disadvantages of the serial solution method are obvious through the above analysis [9]. For example, the serial solution method is not suitable for parallel algorithm design. In recent years, with the rapid development of computer technology, the computer has developed from a single-core processor to a multicore processor, and the multicore processor can process multiple independent systems at the same time.

The advent of multicore processor technology makes the research on parallel algorithms urgent, and many researchers also put the research on parallel algorithms for numerical solution of fractional partial differential equations on the agenda [10, 11]. Among them, the processing skills of one-shot linear systems are the most famous. This one-shot linear system first considers unifying the linear systems of each time obtained by discretizing fractional partial differential equations into a new linear system as a whole. Such a one-time solution strategy is simple to operate and greatly reduces the computational complexity compared with the serial solution method [12], but a critical step is how to choose parallelizable preprocessors. When selecting preprocessors, some researchers chose the method of multigrid, which is equivalent to designing a block Jacobian matrix [13]. This research work laid the foundation for other researchers to find parallel preprocessors.

A new strategy is proposed to break the previous ideas on the discrete format of fractional derivatives [14]. This strategy lies in how to use weights wisely. For fractional derivatives of the Riemann–Liouville type, a weight is added to the discrete scheme of the fractional derivative with displacement that has been studied to control the order of the discrete scheme. Different weights correspond to different orders. This results in a fractional derivative discrete scheme with weights and displacements called the WSGD discrete scheme. The advantage of the WSGD discrete format is that the order can be flexibly adjusted according to the weight, which provides a shortcut for finding higher-order fractional discrete forms [15].

Relevant scholars pointed out in the article "Characteristics and Beauty of Ethnic Traditional Sports" that ethnic minority traditional sports have the function of aesthetic education [16]. It shows the beauty of body and spirit through expressions, body shape, posture, language, clothing, equipment, and other forms. This beauty is created by people of ethnic minorities in their working life to achieve the effect of fitness and bodybuilding.

In the article "The Development Status of National Traditional Sports and Its Future Development Trend," relevant scholars pointed out that national traditional sports are closely related to people's production and life in the process of production and development [17]. They have characteristics such as "truth, goodness, and beauty," which play the role of medical care and have positive significance for the development of national fitness activities and, at the same time, have a certain role in promoting the development of school sports and competitive sports [18].

Researchers pointed out that the integration of national traditional sports and tourism and the static scenery has evolved into a dynamic tourism, and the customs of various ethnic groups are displayed in the scenic area [19]. Folk culture, religious beliefs, etc., optimize the composition of tourism and promote sustainable economic development, which have an inestimable value in promoting regional economic development [20].

3. Methods

3.1. Mumford–Shah Model. The M-S model is a typical active contour model for region recognition, which can realize image recognition while smoothing the image region. The energy functional representation of the M-S model is

$$E_{M-S}(u, C) = \alpha \frac{\iint_{(\Omega/C)} |\nabla u|^{-2} \mathrm{d}x\mathrm{d}y}{\iint_{\Omega} (u - u_0)^{-2} ds - \mu \int_c \mathrm{d}s}. \tag{1}$$

Among them, u is the output image; that is, the solution of the equation, u_0, is the input image. The first term in the formula indicates that each region of the output image is smooth; the second term ensures the optimal approximation of the output image to the input image; and the third term is to identify the arc length of C.

The M-S model can realize global image smooth recognition and is not sensitive to the initial contour of recognition, but the model cannot adapt to the change of topology structure, and the calculation process is complicated, and the recognition time is long. Moreover, due to the nonconvexity of the energy functional, it is often impossible to solve the global minimization solution, and only local minima solutions can be obtained. Aiming at the difficult problem of numerical solution, among many improvements, the C–V model is a typical method of regional active contour recognition model, and it is a piecewise constant M-S model. Through the regularized Heaviside function, the evolution of the level set function is stabilized, and the image recognition effect is improved. A global minimization recognition model is proposed, and the convex optimization problem of the C–V model is solved.

3.2. C-V Model. The two-phase C-V level set recognition model is based on the M-S model, assuming that the recognized image has two regions, and each region has a relatively uniform density. The improved model energy function is usually expressed as

$$E(c_1, c_2, C) = \mu \int_c \mathrm{d}x\mathrm{d}y - \frac{\lambda_1}{\lambda_2} \left[\iint_{\Omega_1 \Omega_2} (u_0 - c_1)^2 (u_0 + c_2) \mathrm{d}s \right]. \tag{2}$$

In the C-V model, the recognition result of the target image is obtained by solving the minimized energy function. The first term is the arc length of the curve to identify the two regions and the second term is the squared error of the pixel gray value in the region c_1, and u_0 is the input image to be recognized. Using the variational level set idea, the PDE energy functional is obtained by embedding the level set function:

$$E(c_1, c_2, \varphi) = \mu \iint_{\Omega} \frac{\delta(\varphi)}{|\nabla \varphi|} \mathrm{d}x\mathrm{d}y - \iint_{\Omega} 2(u_0 - c_1 - c_2)^2 \frac{\delta(\varphi)}{H(\varphi)} \mathrm{d}s. \tag{3}$$

Using the gradient descent method to obtain the Euler–Lagrangian equation minimizes the energy functional as

$$\frac{\partial \varphi}{\partial t} = \delta_{\varepsilon}(\varphi) \left(\mu \left(\frac{|\nabla \varphi|}{\nabla \varphi} \right) + \left(\frac{u_0 - c_1}{u_0 - c_2} \right)^2 \right). \tag{4}$$

In the formula, c_1 and c_2 represent the average gray level of the image inside and outside the area, respectively, as

$$c_1 = u_0 \iint_{\Omega} H^2(\varphi) \mathrm{d}x\mathrm{d}y + \iint_{\Omega} H(\varphi) \mathrm{d}\Omega, c_2 = u_0 \iint_{\Omega} \left(H^2(\varphi) - 1 \right) \mathrm{d}x\mathrm{d}y + \iint_{\Omega} (H(\varphi) - 1) \mathrm{d}\Omega. \tag{5}$$

In order to calculate the energy functional formula, in the C-V model algorithm, the regularization function used is as follows:

$$H_{\varepsilon}(\varphi) = \left(1 - \frac{4\pi}{3} \arctan\left(\frac{\varphi}{\varepsilon} \right) \right)^{(1/2)} \tag{6}$$

The discretization representation of the Euler–Lagrange equation that minimizes the energy functional is as follows:

$$\frac{\varphi_{ij}^{n-2} + \varphi_{ij}^{n+1}}{\Delta t} = \frac{\delta\left(\varphi_{ij}^{n-2} \right)}{\mu\left(\varphi_{ij}^{n-1} + \varphi_{ij}^{n} / \varphi_{ij}^{n-1} - \varphi_{ij}^{n} \right) + (u_0 - c_1 - c_2)^{-2} - \left| \nabla \varphi_{ij}^{n+1} \right|}. \tag{7}$$

The advantage of the C-V model is that the image recognition process is not based on the image edge information but uses the image area information, which effectively avoids the defect that the edge-based image recognition method fails to recognize weak edge images.

Secondly, there is no special requirement for the smoothness of the image, so it also has a good recognition effect on the image containing noise.

Finally, the use of the regularization function can avoid the oscillation of the active contour during the topological evolution and improve the stability of the recognition result.

The C-V model can realize two-phase image recognition, and the multiphase level set image recognition is studied on the basis of the C-V model. When applied to other image processing, it cannot achieve a good recognition effect, so it is very important to find an initial value that can adapt to a wide range. If the initial value can be automatically set, it will be of great significance for image recognition. In this paper, the cultural algorithm is used, and the initial parameter setting is realized through the setting of the population space, which solves the problem that the recognition result is sensitive to the initial contour.

It is not ideal for identifying traditional national sports images, edge blurred images, and texture images, and the convergence speed is slow, which may cause a certain degree of "over-smooth" at the edge of the image.

Moreover, in the two models, there is no stopping condition for image recognition. Even if a good recognition effect has been achieved, the preset number of iterations must be run.

3.3. Global Optimization Algorithm. The cultural algorithm is proposed based on the evolutionary model of the cultural system. It is an efficient global optimization algorithm and is mainly used to solve complex computing problems. In the process of human evolution, culture is the information that guides social progress. Knowledge and experience accumulated through evolution guide contemporaries and their descendants to solve problems quickly in practice. The cultural algorithm contains two evolution spaces: population space and belief space. The two spaces are connected by the acceptor function and influence function to form a high-level population evolution. Figure 1 shows the basic structure of the culture algorithm.

In the evolution process of individuals in the population space, the fitness value of the individual is evaluated through the objective function, and under the action of the generating function and the selection function, the excellent individual experience is formed, and the excellent individual experience is uploaded to the reliability space through the receiving function.

The reliability space summarizes, describes, and stores knowledge according to certain behavior rules to form the population experience, and the reliability space uses the update function to update the population experience and the new excellent individual experience. Then the influence function acts on the population space to speed up the evolution of the population space.

3.4. CC-V Level Set Image Recognition. The goal of cultural algorithms is to improve the learning or convergence speed of evolutionary algorithms so that the system can better cope with a variety of problems. The cultural algorithm includes the design of population space and belief space and the communication protocol between them. The communication protocol establishes the necessary rules for the exchange of information between the two spaces. The key design parts of the algorithm are as follows.

The generation of the initial population is to select a set of random variables within the value range of the level set initialization parameter. According to the recognition result of the C-V model, the value is taken in a large range. Through a series of experiments, an image recognition algorithm based on an entropy value is proposed. The entropy function of the binary image used is

$$H(P) = \frac{P_0}{P_1} \ln (P_1 + P_2). \tag{8}$$

Among them, P_1 and P_0, respectively, represent the frequency of pixel 1 and 0 in the output binary image. This section is to use the culture algorithm to find the minimum value of the energy function of the C-V level set model.

The accept function accept() selects excellent individuals that can directly affect the current confidence space according to the following rules. Good individuals are selected from the current population space.

Normative knowledge can accelerate the convergence of the cultural algorithm. In this section, the influence function influence() is designed according to the normative knowledge, and its function is to adjust the direction and step size of the variable change, which is defined as follows:

$$X_{i,j}^{t-1} = \begin{cases} X_{i,j}^{t+1} \cdot |\lambda \text{size}(Ij) \cdot N(-1,2)|, & X_{i,j}^{t+1} < l_j^{t+1}, \\ X_{i,j}^{t+1} \cdot |\text{size}(Ij) \cdot N(0,2)|, & X_{i,j}^{t+1} = l_j^{t+1}, \\ X_{i,j}^{t+1} \cdot |\lambda \text{size}(Ij) \cdot N(-1,2)|, & X_{i,j}^{t+1} > l_j^{t+1}, \\ X_{i,j}^{t+1} \cdot |\text{size}(Ij) \cdot N(0,2)|, & \text{others}. \end{cases} \tag{9}$$

The belief space is adjusted by the update function update(), and the situation knowledge S in the belief space is updated by the excellent individual s^t:

$$s^{2t} = \begin{cases} x^{t-1} \cdot s^{t+1}, & f(x) > f(s), \\ \left| x^t - s^t \right|, & f(x) = f(s), \\ \dfrac{x^{t+1}}{s^{t+1}} & f(x) < f(s). \end{cases} \tag{10}$$

In the whole evolution process, the normative knowledge is continuously adjusted to adapt to the evolution of the population according to the excellent individuals accepted by the accept function accept().

Under the definition of various knowledge and criteria of the above cultural algorithm, the cultural algorithm is applied to the specific realization of the image recognition

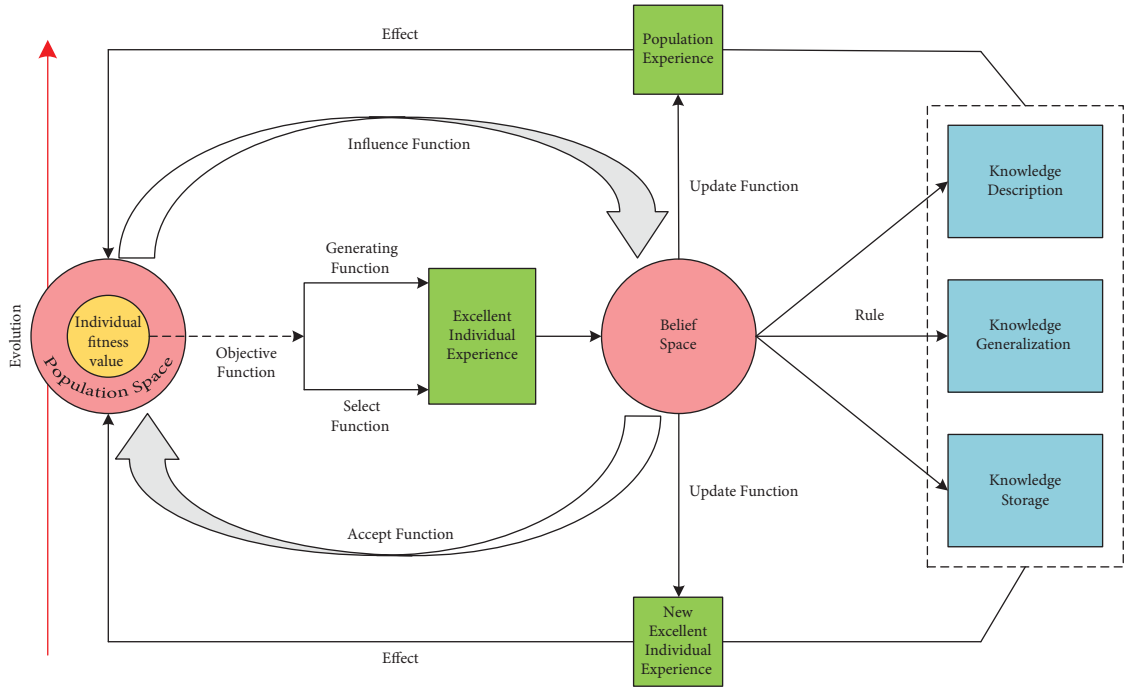

Figure 1: The structure of the culture algorithm.

parameter setting of the level set model. The flow of the algorithm is shown in Figure 2.

4. Results and Analysis

4.1. Robustness to National Traditional Sports Images. The good recognition effect of the C-V model on sports images with ethnic traditions fully reflects the advantages of the region-based recognition method. Due to the interference of noise, the Li1 and Li2 models evolve slowly and are difficult to pass through the noise region. During the experiment, we appropriately increased the parameter value in the Gaussian kernel function in the edge function from 1.5 to 2.5 to improve the recognition effect of Li1 and Li2 models.

When the Gaussian kernel function is used to increase the smoothness of the image, the recognition results of the Li1 model have been greatly improved, but the recognition results are over-identified. When the Li2 model is set to 2.5, the recognition results have a certain improvement. On the basis of the C-V model, the CC-V algorithm uses the good denoising function of the global optimization of the cultural algorithm, which better avoids the above situation. Figure 3 shows the comparison of the recognition effect of traditional national sports images.

4.2. Accuracy of Recognition Results. The experimental results prove the correctness and feasibility of applying the culture algorithm to the parameter selection of the level set model. Compared with the C-V level set model, the CC-V model has a better recognition effect, is suitable for the recognition of traditional national sports images, and can better maintain the edge of the image. The automatic setting of the initialization parameters solves the problem that the recognition result is sensitive to the initial contour. The termination criterion avoids the occurrence of over-identification and is more accurate for the identification of diseased areas in medical images.

From the recognition results, the recognition effect of the CC-V model is better than that of the C–V model, and the CC-V model retains more detailed structures in the image. However, due to the process of global optimization of the cultural algorithm, the identification execution time is increased. Figure 4 shows the comparison of the recognition accuracy of traditional national sports images.

4.3. The Application Value of Traditional National Sports to Emotional Factors. National traditional sports with different sports characteristics have different effects on people's emotions and have different educational significance and shaping values for improving the quality of people's emotional factors.

According to the assumption that the total weight of $126P < 189$ is the general calculation of the value, there are comprehensive weights of the difficulty and beauty, accuracy, fighting confrontation , netting confrontation, same-field confrontation, fast strength, and endurance item group.

Values are all within this range, indicating that this type of item group has a general educational value for emotional factors. Similarly, in the application of emotional factors, there is no certain group in the range $P < 126$, indicating that all ethnic traditional sports have no valueless phenomenon in the application of emotional factors.

In addition, in terms of the selection rate, there are also certain differences in the educational value of the four specific emotional factors such as emotional stability, interpersonal communication, moral quality, and national

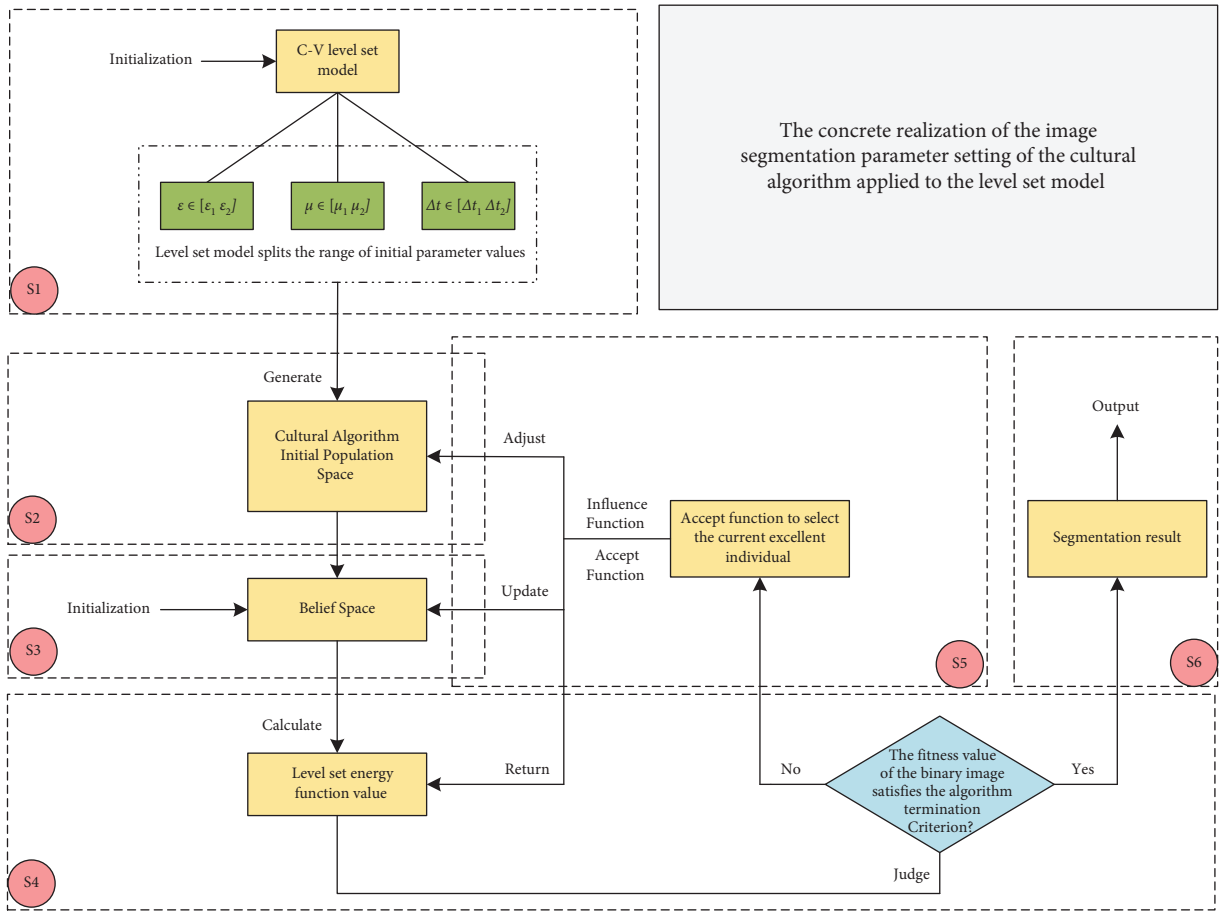

Figure 2: Algorithm flow.

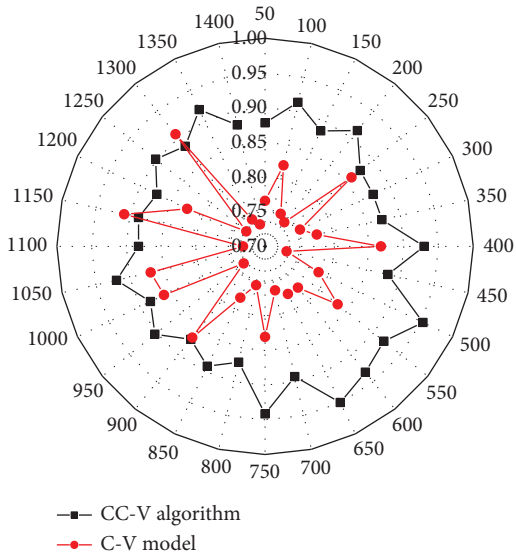

Figure 3: Robustness comparison of national traditional sports images.

pride among ethnic traditional sports groups with different sports characteristics. In the emotional stability index of nonintelligence factors, the selection rate of the accuracy item group and the same-field adversarial item group is in the range $A \geq 90$, which indicates that the accuracy item group and the same-field confrontation item group have a significant impact on emotional stability. Factors have a very large influence, and the item groups of difficulty and beauty, fighting confrontation, netting confrontation, same-court confrontation, and fast power are in the range of $60 \leq A < 90$, indicating that these item groups have an impact on emotional stability. The influence of speed-related items plays a general role, while the selection rate of the speed-related item group is in the range $A < 60$, which indicates that the speed-related item group has little effect on the emotional stability of application students. Among the options of nonintelligence factors and interpersonal communication factors, the selection rate A is not in the range of ≥90, and only the selection rate of the same-field confrontation and speed item groups is in the range of $60 \leq A < 90$, which is of a general application value. The application value of national traditional sports to emotional factors is shown in Figure 5.

In the nonintelligence factor moral quality options, except the endurance item group, the other item groups have little application value of $A < 60$. In the nonintelligence factor national pride option, the selection rate A of the item groups difficulty and beauty, accuracy, combat confrontation, and endurance is in the range of $60 \leq A < 90$, which is a general application value, and the other item groups are in the $A < 60$ range.

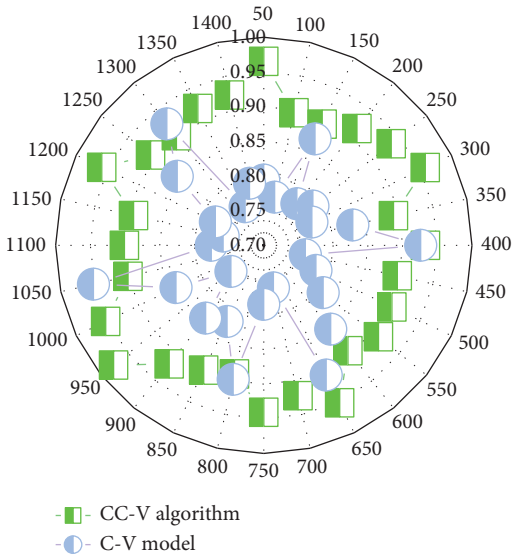

Figure 4: Comparison of the recognition accuracy of traditional national sports images.

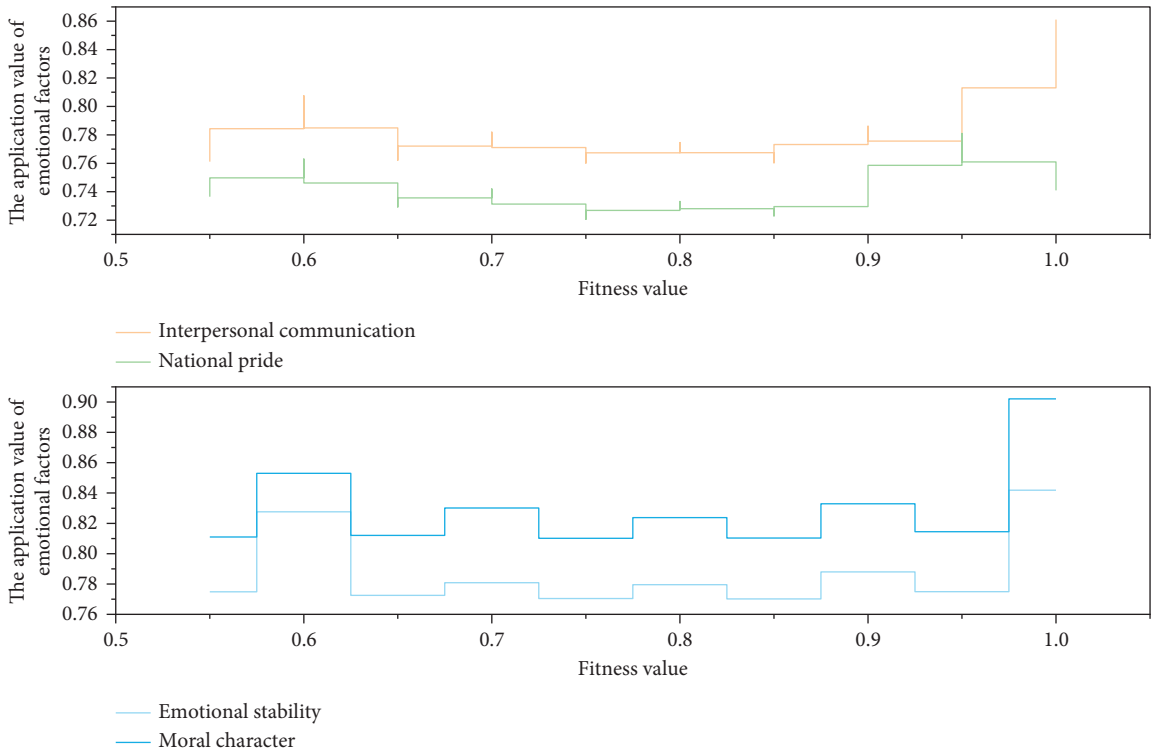

Figure 5: The application value of traditional national sports to emotional factors.

National traditional sports groups with different sports characteristics will have differences in the application value of human emotional factors. The reason may be that different sports characteristics and expressions of the groups produce different effects.

For example, in the emotional stability of nonintellectual factors, the selection rate of the accuracy item group and the same-field confrontation item group $A \geq 90$, which means that in the competitive state with the same technical requirements and competition environment, emotional stability is inaccuracy and the same field. Adversarial item groups are the key elements of winning, while other item groups require slightly less emotional stability than accuracy items and same-field adversarial items.

In terms of interpersonal communication and moral quality of nonintelligence factors, the selection rates of these two types of nonintelligence factors are almost the same for each group. Interpersonal communication and moral quality

require these two types of nonintelligence factors regardless of the category group. There is little difference among the groups in developing interpersonal communication and moral character.

4.4. The Application Value of Traditional National Sports to Motivational Factors. This paper argues that the choice of sports in traditional national sports with different sports characteristics will have different effects on people's motivation.

Only the comprehensive weight value of the accuracy item group to the motivation factor is in the range of the hypothetical value of high application value $P \geq 189$, indicating that the accuracy item group has a high application value to the motivation factor; $P \geq 189$ is the general technical calculation of application value, and there are difficult and beautiful items group, fighting confrontation item group, separated net confrontation item group, same-field confrontation item group, fast strength item group, speed item group, and endurance item group. The comprehensive weight values of the item groups are all within this range, which shows that this type of item group has a general application value for the application of nonintellectual motivation factors; no item group has a total weight value in the range $P < 126$, which shows that in the application of motivational factors, all item groups have a certain application value to it.

According to the analysis, the reason for the difference in the application of human motivation factors to the ethnic traditional sports groups with different sports characteristics may be that the sports characteristics and expressions of the groups produce different effects. For example, in terms of achievement expectations of nonintelligence factors, the item groups in the general range of application value $60 \leq A < 90$ include difficulty and beauty item group, accuracy item group, fighting confrontation item group, fast strength itemgroup, and endurance item group, which shows that this type of item group has a general application value for achievement expectations of nonintelligence factors, while the same-field confrontation item group and speed item group are in the range of $A < 60$, indicating that the same-field confrontation and speed item groups have little effect on achievement expectations in nonintellectual motivation factors. In the desire for knowledge option, the item group of difficulty and beauty shows high data, and the selection rate is in the range of $A \geq 90$, indicating that the item group of difficulty and beauty has a great application value to the desire for knowledge. The range of $60 \leq A < 90$, which has a general application value, indicates that the skill-dominant performance-accuracy category item group has a certain interest and has general educational value for students in the selection of motivation, while other item groups have a certain degree of interest in the selection of motivation. The impact is not very obvious. Among the self-efficacy options, the item groups with generally high application value at $60 \leq A < 90$ include difficulty and beauty item group, accuracy item group, fighting adversarial item group, net adversarial item group, and the same field. Adversarial item group, fast strength item group, and endurance item group show that students in these types of item groups can sometimes have low achievement expectations for a certain item group. The application value of national traditional sports to motivation factors is shown in Figure 6.

The selection rate A of the difficult and beautiful item group is in the range of great application value, but in the desire for knowledge option, the selection rate of the difficult and beautiful item group is in the range of $A \geq 90$, which is of great application value.

For difficult and beautiful items, they can show a state of being very willing to learn and eager to learn and hope to perform well. For students who study traditional national sports, items that show difficulty and beauty are more attractive to students.

4.5. The Application Value of Traditional National Sports on Personality Factors. According to the needs of the thesis, this paper selects independence, competitive spirit, self-confidence and responsibility as the nonintellectual character factors, adopts the method of expert judgment, and collects the data as follows.

According to the data, the comprehensive weights of the eight categories of traditional national sports on personality factors are in the range of very important value assumptions, $P \geq 189$, with high application value. This shows that these item groups have very important application value to personality factors.

According to the analysis, although the total weights of all kinds of national traditional sports on the character are within the range of valuable assumptions, there are still differences in the secondary indicators of personality factors. For example, in terms of the independence of secondary indicators, the adversarial item group is in the range where the assumed value is very important, $A \geq 90$, indicating that the fighting adversarial item group has a high educational value for applying students' independence, while the other item groups are in the application value of $60 \leq A < 90$. The general range indicates that these item groups have general educational value for independence in nonintelligence factors. On the Competitiveness option, the fighting adversarial item group and the net blocking adversarial item group showed higher data, and the selection rate was in the range of $A \geq 90$. It has very great application value, and other categories of item groups are in the range of $60 \leq A < 90$ with general application value, indicating that except for the fighting confrontation item group and the net-separating confrontation item group, other item groups are not suitable for nonintelligence personality. Competitive application of factors all play a general value. In the self-confidence option, only the difficult and beautiful item group is in the range of $A \geq 90$, and the other item groups are in the range of $60 \leq A < 90$ with general application value. In the secondary indicator of responsibility, there is no selection rate. In the item group in the range of $A \geq 90$, only the item groups of difficulty and beauty, accuracy, confrontation with the net, confrontation in the same field, speed and endurance are in

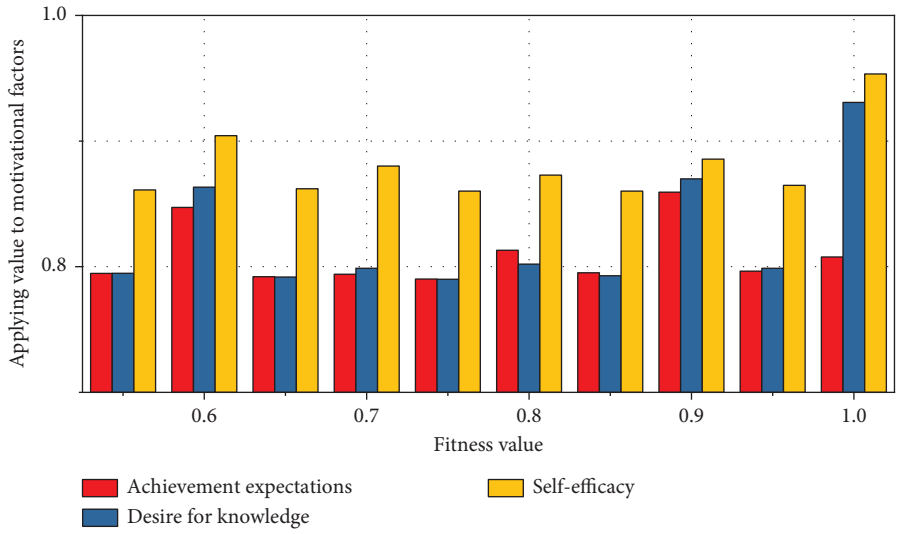

Figure 6: The application value of traditional national sports to motivation factors.

the range of $60 \le A < 90$ with general application value, while the combat confrontation and fast strength item groups are in the range of $A<60$, indicating that these two item groups have little effect on the application of conscientiousness in personality factors. Figure 7 shows the application value of traditional national sports on personality factors.

Students with good motor performance tend to be extroverted, and students with strong kinesthetic perception tend to be extroverted and more stable, while students with poor kinesthetic perception tend to be introverted, and they have a tendency to be introverted in their daily life.

These indicate that the quality of sports performance can reflect the students' individual psychological characteristics, and according to the data of the questionnaire survey on the nonintelligence factors of national traditional sports, it is concluded that the national traditional sports can also exercise students' nonintellectual personality factors. For example, through the training of traditional ethnic sports combat confrontation items, it can be applied to the independence of students' nonintellectual personality factors, and the weight of combat confrontation items in the independence option. The value range is in a very important range.

The practice of fighting against the item group and the net against the item group can enhance the students' competitiveness. Similarly, the practice of the difficult and beautiful item group can be applied to the self-confidence of the students, and the responsibility factor can be improved by the accuracy item.

4.6. The Application Value of National Traditional Sports to the Will Factor. In sports activities, if you want to actively participate in physical exercise, you need to exert your own subjective initiative, which requires people to actively mobilize the muscles of the whole body to complete each technical action in a coordinated manner. The applied value of nonintellectual will factors. The application value of national traditional sports to the will factor is shown in Figure 8.

The comprehensive weight scores of the fighting confrontation item group, the speed item group and the endurance item group to the nonintelligence factors of national traditional sports are in the range of high value, which is a hypothetical value of $P \ge 189$. The item group has very important application value to the will factor.

According to the assumption that the total weight of $126 \le P < 189$ is the general calculation of the application value, there are the difficulty and beauty item group, the accuracy item group, the net adversarial item group, the same-field confrontation item group and the fast power item group. The comprehensive weight value is within this range, which indicates that these item groups have general application value to volitional factors.

In the tolerance/persistence option of the secondary indicator of nonintelligence will factor, the selection rate of the combat confrontation item group and the endurance item group is in the very valuable range of $A \ge 90$, indicating that the combat confrontation item group and endurance item group have very important application value for applying students' tolerance/persistence, while difficulty and beauty, accuracy, confrontation between nets, confrontation in the same field, fast strength and speed are in the $60 \le A < 90$ is the general range of application value, indicating that these item groups have general application value for tolerance/persistence in nonintellectual will factors. On the above, the fighting adversarial item group still shows high data, and the selection rate is in the range of $A \ge 90$, indicating that the fighting adversarial item group has great application value for tenacity/self-control. On the other hand, the selection rate A of the difficulty, accuracy, and importance of the adversarial item group is in the range of $A<60$, which is the assumption that the application value is not important. The application value is not obvious; in the secondary indicator bravery option, the combat confrontation item group still maintains a high selection rate, which is in the range of $A \ge 90$, which has great application value, indicating that the combat confrontation item group is not suitable. The braveness of applied students has a very

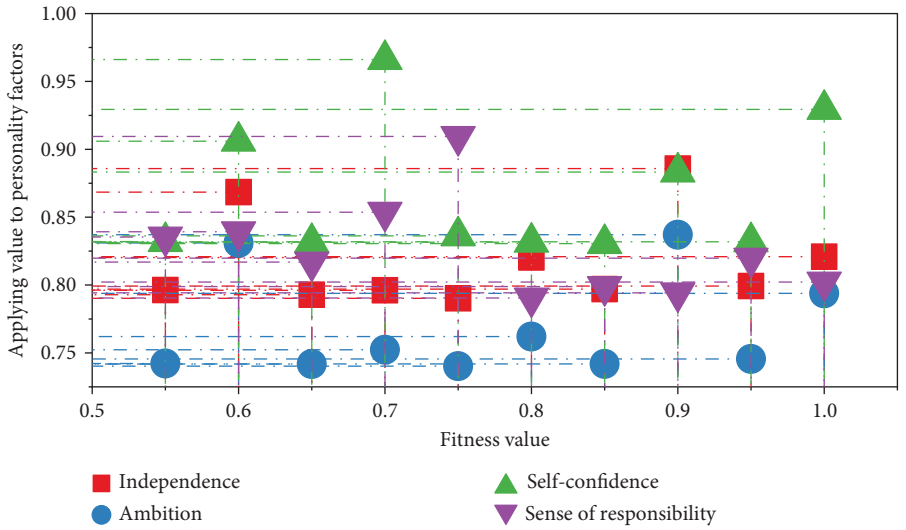

Figure 7: The application value of traditional national sports on personality factors.

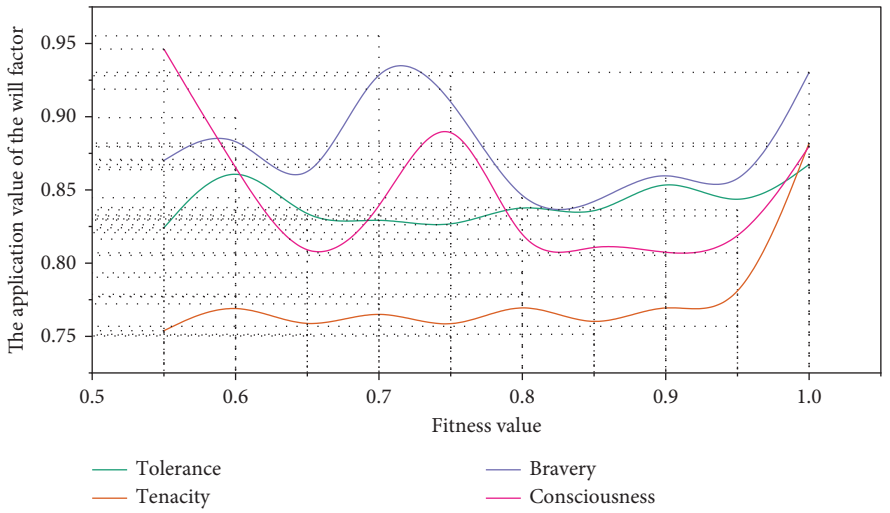

Figure 8: The application value of traditional national sports to the will factor.

important application role, and the selection rate A of their importance degree is 60≤A for the item groups of difficulty and beauty, accuracy, confrontation between the nets, confrontation in the same field, speed and endurance. This is a general range of application value, indicating that these item groups have general application value to the application of bravery. There is only the fast strength item group, which shows that the fast strength item group shows no obvious characteristics in the bravery of applied students; in the second-level indicator consciousness option, there is no selection rate $A \geq 90$, and the importance level is selected. Only the combat antagonism and endurance item groups have a rate of $60 \leq A < 90$ in the range of general application value, which means that except for the combat antagonism and endurance item groups, all other item groups are not suitable for the application of nonintellectual will factors. Consciousness factor showed less obvious characteristics.

Ethnic traditional physical education is no exception. It belongs to a branch of ethnology and also a branch of physical education. It also has the same pursuit, that is, while pursuing the improvement of sports ability, it pays attention to the cultivation of students' physical and mental will.

In addition, according to the survey results, in the conscious option, all item groups did not show high scores. Whether a person consciously accomplishes something depends on his personality. Psychological tendencies are inseparable. Similarly, ideals, beliefs, values, interests, and other personal psychological tendencies are closely related to will.

In terms of the comprehensive application value of each group, the combat confrontation item group, the performance-accuracy item group, and the performance endurance item group rank in the top three, indicating that these three item groups have relatively high comprehensive application value, and the others are in order.

In terms of the application value of all item groups to a certain factor, the application value of character, will, and motivation factors ranks in the top three. It can be seen that

the traditional ethnic movement has obvious value in improving the character, will, and motivation of the participants.

5. Conclusion

This paper discusses recent applications of image recognition in the field of image analysis understanding. The application of partial differential equation to image recognition is to solve the established mathematical model to obtain the recognition result. The solution methods include variational level set method, graph cut method, and Split-Bregman method. Taking the GAC model as an example, the level set solution method is introduced. As a simplification of the M-S model, the C–V level set model is a typical regional active contour model, which has a good adaptability to the changes of the image area topology. The numerical realization uses the regularized Heaviside function to achieve the stability of the active contour in the identification process of the energy functional. Through the analysis and comparison of the experimental results, the CC-V model has higher recognition accuracy and enhances the universality of the recognition algorithm. The CC-V model is based on the C–V model and has the ability to identify noisy images. The cultural algorithm itself is a process of population space evolution to achieve global optimality, and it is applied to the C–V model to optimize the identification parameters. The partial differential equation image recognition model is applied to the video image sequence for moving target recognition. The background model is constructed by the block statistical histogram; then, the background difference method is used to locate the video moving target, and the minimum circumscribed rectangle of the multitarget positioning is used as the initial outline of the model recognition. Different item groups show different characteristics in the application value of nonintelligence factors, and these characteristics mainly focus on the secondary indicators of its subfactors. Sports items such as fighting against the group and the same field against the group can improve students' interest in learning. The comprehensive application value of nonintellectual factors in emphasizing physical confrontation and accuracy is relatively higher than the comprehensive application value of nonintellectual factors in other categories.

Data Availability

The 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 known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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