Hindawi
Wireless Communications and Mobile Computing
Volume 2022, Article ID 1275508, 14 pages
https://doi.org/10.1155/2022/1275508

Research Article

Design and Practice of Aerobics Teaching Design Based on Data Fusion Algorithm

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Received 27 October 2021; Revised 18 November 2021; Accepted 23 November 2021; Published 11 January 2022

Academic Editor: Alireza Souri

Aerobic exercise is a very popular form of exercise. It combines various forms of sports and music. Aerobic exercise improves muscle tone and relaxes the mind and body while burning calories. It is designed to individualize instruction for different audiences. It is an important factor in the applicability of the operation. The purpose of this paper is to build different human models based on sensor network numbers to quantify different movements through the Internet of Things (IoT) to design personalized curriculum design and practice to improve the popularity of creative aerobics curriculum. In this paper, we first give an overview of the algorithm and data fusion algorithm and then simulate the aerobics creative curriculum design. First, the variance is used as the error measure to establish the data fusion algorithm and aerobics new concept innovation curriculum design and practice. The established model is compared with the aerobics curriculum design under the traditional model to highlight the advantages of the curriculum design under the data fusion algorithm. A comparison is also made with examples. The experimental results show that the data of the audience's movement changes during different creative processes solve the aerobics creative editing problem. Compared with the traditional curriculum design, the efficiency of the curriculum design and practice is improved by 20.23%.

1. Introduction

With the interactive development of education and the Internet, various universities and the Ministry of Education have made significant progress in the pilot work of modernity education reform. In 1999, the Ministry of Education launched various educational resource construction projects at all levels and built a large number of excellent online courses and educational software. At the same time, major universities developed a large number of projects based on their own educational characteristics and various resource construction projects. Excellent online course education teaching and education software, for different subject characteristics and teaching methods, developed a teaching resource library based on data algorithms, online teaching courseware, and material collection. With the rapid development of computer technology, wireless communication technology, sensor technology, and embedded system technology, some miniature sensors with low production costs and low power consumption have emerged. It is the favorite of all walks of life. Data fusion algorithm technology is a data processing technology that automatically sorts, analyzes, and synthesizes the collected information under certain rules based on the node network of big data and then completes the required evaluation and decision-making. Aerobics is a kind of exercise that not only exercises the body but also cultivates the sense of art. It combines music, sports, and dance as a whole project, full of modern atmosphere, and is favored by the majority of groups.

For a long time, the teaching structure is a stable structure model of teaching activities under the guidance of certain educational thoughts, teaching theories, and learning theories, and it is impossible to carry out personalized courses for different students. Incorporating the technical means of data fusion algorithm into the design and practice of aerobics creative curriculum is an important means of physical education reform. It can enrich the content and means of teaching reform and promote the all-round development of people and cultivate the sense of innovation.

The rise of algorithm technology has brought more accurate and convenient functions to the development of mankind. Among them, Liao et al. reported on the results of the 2014 Data Fusion Competition organized by the IEEE GRSS Image Analysis and Data Fusion Technical Committee (IADFTC). As in previous years, the Data Fusion Technology Committee organized a data fusion competition to cultivate new ideas and solutions for multisource remote sensing research [1]. However, Yokoya et al. reviewed the concepts, principles, and tools that unify current causal analysis methods and deal with the new challenges posed by big data. In particular, Yokoya et al. solve the problem of data fusion-piece together multiple data sets collected under heterogeneous conditions (that is, different populations, systems, and sampling methods) to obtain effective answers to queries of interest [2]. To this end, Ambuhl and Menedez define a fusion algorithm that divides the city network into two subnetworks, one with a loop detector and one without. The simulation of the abstract grid network and the Zurich city network shows that the fusion algorithm can always significantly reduce the estimation error [3]. The purpose of this study is to determine the feasibility of using aerobic exercise courses to produce potential skeletal protection vertical effects and to determine whether the effects can be predicted by body function. Hannam et al. recruited participants from the senior exercise program to complete the SF-12 questionnaire, short-term physical training, and aerobic exercise program with seven different components, conducted at low intensity and high intensity. The maximum beating value is determined for each activity [4]. Melam et al.'s research shows that lack of physical exercise and uncontrolled diet can lead to excessive weight gain, which can lead to obesity and other metabolic disorders. Melam et al.'s research shows that brisk walking and aerobic exercise are the best ways to control and reduce body weight and weight components [5]. This requires aerobics staff not only to have professional aerobics methods and skills, but also to have the basic skills of aerobics in order to compose perfect aerobics in the new situation. Ma based on the performance of aerobics, the experience of the competition, and the arrangement of the aerobics, let the audience have a bright feeling in the vision. At the same time, when Ma organizes aerobics, each movement must be carefully designed to make the choreographed movements have a comfortable and pleasant feeling. The movement does not look too rigid, giving the overall beauty and aerobic exercise. The characteristics are reflected in the design of the action to achieve better results [6]. The purpose of this research by Catalina is to conduct multiple sets of experiments to observe the creation of aerobics courses based on data fusion algorithms. Based on the results of the all-round record of the courses, it emphasizes the independent and organized way of performing aerobics [7]. There are some shortcomings in their research. The curriculum creation based on big data relies on a huge database and a powerful technical environment. The scope of the data in this article is limited, and it is still necessary to expand the experimental objects to make the research more typical.

The innovation of this article (1) lies in the use of data fusion and algorithms combined with aerobics to create a curriculum that has the basic characteristics of network communication such as digitization and interactivity in a network technology environment and at the same time reflects the characteristics of education and (2) teaching goals. The teaching of diversified and multilevel online courses is no longer just for the purpose of presenting the teaching content. In the face of different personalized audiences, such as different basic learning levels and inconsistent physical indicators, a multilevel teaching curriculum design should be designed, to promote the development of everyone.

2. Design of Innovative Aerobics Curriculum Based on Sensor Network and Communication Algorithm

2.1. Data Fusion Algorithm. Data fusion is the process of combining, correlating, and combining data and information from multiple sensor sources to obtain more accurate location and identity estimates for a real-time, complete evaluation of battlefield posture and threats and their importance.

2.1.1. Basic Theory of Algorithm. In order to study the sensor data fusion algorithm, firstly, the algorithm operation is briefly introduced. Assuming that M distributed sensors are deployed in the wireless sensor network system, the i -th sensor corresponds to the Mi-th convergent sensor. The definitions of the dynamic model and the measurement model of the discrete-time target in the data fusion tracking system correspond to two sets of equations, respectively:

$$\begin{aligned} A(m+1) &= P(m)A(m) + F(m)H(m), \\ B_i(m) &= C_i(m)A(m) + L_i(m), i = 1, \cdots M. \end{aligned} \tag{1}$$

The other two sets of equations are as follows:

$$A_i(m+1) = P_i(m)A_i(m) + F_i(m)H_i(m), i = 1, \cdots, M. \tag{2}$$

Then,

$$B_i(\mathrm{m}) = G_i(m)A(m) + L_i(m), i = 1, \cdots, M, \tag{3}$$

expressed as the latter model, where $P_i(m)$ represents the conversion matrix, $F_i(m)$ is the input gain matrix, $H_i(m)$ represents the feedback of the i-th sensor, and $L_i(m)$ represents the measurement error of the sensor.

2.1.2. Data Fusion. In the current military field, the direct driving force for the development of information fusion technology is the development of information-based weaponry and the new battlefield perception needs arising from the emergence of information-based combat styles (e.g., network-centric warfare). At present, with the expansion of combat space to space and Cyber space, the fusion processing of remote sensing telemetry and battlefield surveillance images has become an urgent need for full-field battlefield perception, especially the fusion of heterogeneous media images has become an urgent problem for combat identification and a hot spot for current research. The technologies involved include spatial alignment of heterodyne images, feature extraction and unified representation of heterodyne images, quality assessment of fused images, and application implementation.

Data fusion algorithms are a specific research direction for data processing using multiple sensors. A simple definition can be summarized as the process of information processing using computer technology to automatically analyze the information acquired by sensors according to certain sequential rules using a computer language to fully accomplish the required estimation and decision-making tasks [8]. According to the above definition, the acquisition of information from multiple sources is the basis of data fusion technology processing, integrated processing, and coordinated optimization is the core of the data fusion algorithm, and the sensor system is the hardware basis of the whole data fusion algorithm. The development of artificial intelligence and data node neural networks, pattern recognition, image and image generation, signal clustering processing, and other related technologies provides rich theoretical and technical means for data fusion algorithm technicians. Combining the findings of these disciplines can maximize our efficiency and help us make the right estimates and decisions.

The ultimate goal of data fusion is achieved by four different levels of processing layers, as shown in Figure 1.

In Figure 1, the first level of processing is object assessment. The main tasks in this level of processing include the following: data registration, data association, and identity estimation. The results of this level of processing will provide relevant information for decision-making assistance for more advanced processing processes [9].

Data registration is essentially to align information with different characteristics in time and space so that multisource data can be processed in a unified framework and pave the way for the subsequent work of fusion. The main work of the so-called data association is to combine and classify multisource data [10]. The role of identity estimation is to solve the problem of characteristics and expressions related to entity attributes. Target evaluation deals with numerical calculations, and identity estimation is usually based on pattern recognition techniques or parameter matching techniques, including the following: majority voting, Bayes method, and D-S evidence theory, as shown in Figure 2.

The second level of processing is situation assessment. The main task at this level is to abstract and assess the overall situation. The input information for situation assessment includes the following: event monitoring information, state estimation information, and relevant assumptions necessary for situation assessment, while the output refers to the probability corresponding to the necessary relevant assumptions [11, 12]. The result is shown in Figure 3.

The third level of processing is impact assessment. The impact assessment establishes a mapping from the current situation to the future, an assessment of the possible impact of the participant's assumptions and predictions. Different data input/output will have different effects. Data in and out (DAI-DAO): This type is the most basic data fusion method. The input and output are all raw data, and the output data is usually more reliable, higher, or more accurate [13]. This level of data fusion is carried out as soon as the data is output from the sensor, and the fusion method is based on signal and image processing algorithms, as shown in Figure 4.

(1) *Data In and Feature Out (DAI-FEO)*. This level of data fusion performs feature extraction on the original data.

(2) *Feature In and Feature Out (FEI-FEO)*. This level of input and output processing is all features, so it is essentially a set of features to improve or obtain new features. This process is also called feature fusion, information fusion.

(3) *Feature In and Decision Out (FEI-DEO)*. The input at this level is a set of features, and the output is a set of decisions. Most classification systems that make decisions based on sensor input belong to this level.

(4) *Decision-In-Decision-Out (DEI-DEO)*. This classification is also called decision fusion, which combines input decisions to obtain better decisions.

The fourth level of processing is process assessment.

The monitoring and evaluation of this process requires the establishment of relevant optimization indicators [14, 15]. In addition, it is necessary to achieve timely acquisition and effective processing of multiple sensor information, as well as to achieve the best allocation of resources so as to be able to support specific tasks, so as to achieve the purpose of improving the real-time performance of the system. As shown in Figure 5, it shows the processing relationship between different data.

Since data fusion is a process of gradually processing multisource information, when there is a step-like and multilevel multisource information fusion, we have to put forward requirements for data fusion, that is, in each fusion process, every link, the amount of useful information carried by the sensors should be used to the maximum. Therefore, the data fusion system maximizes the amount of useful information in each node during each fusion process, and the fusion result should be required to be beneficial to the system users. Moreover, the amount of useful information of each data should organically inherit the role of other parts. When some processes are close to the experience, the effect of the resulting effective amount of data will not be weakened in other processes entering the system, that is, various parts of the system, to achieve harmony and unity [16].

2.1.3. Bayesian Estimation Method to Calculate Data Fusion. The Bayesian estimation method is a commonly used method in static data fusion.

Assuming a state space, the Bayesian estimator provides a method to calculate the posterior (conditional) probability distribution. Assuming that the state quantity at time i is X_j, it is known that the measurement $Mi = \{M1, \cdots, Mi\}$ and

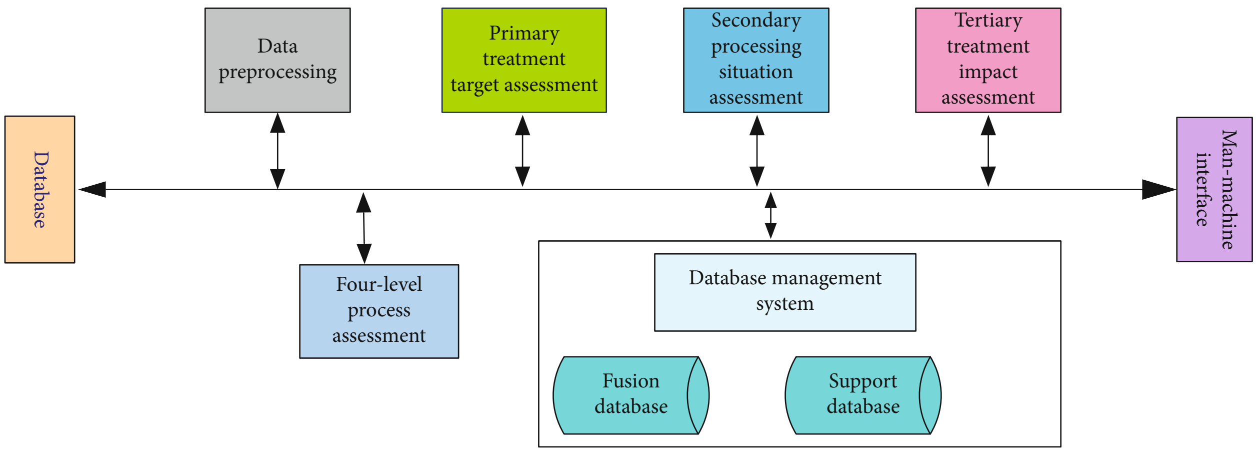

Figure 1: JDL data fusion model.

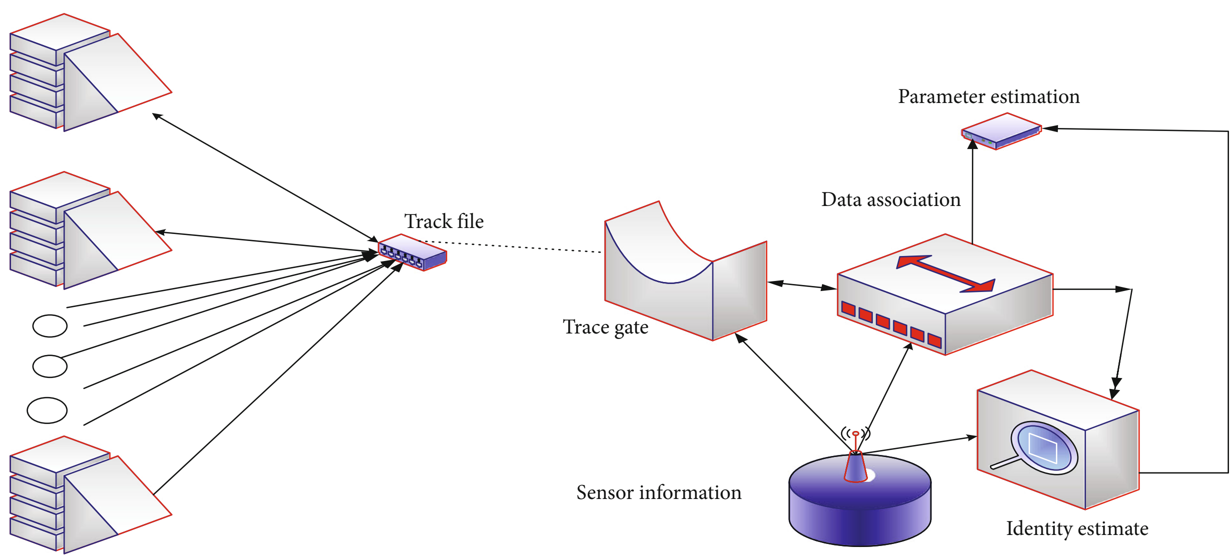

Figure 2: Object evaluation model in primary processing.

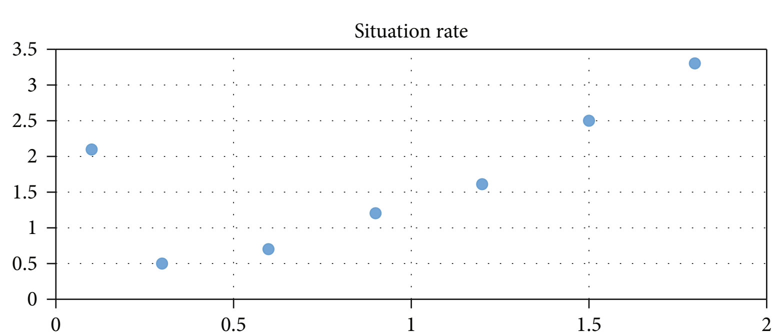

Figure 3: Situation assessment analysis chart.

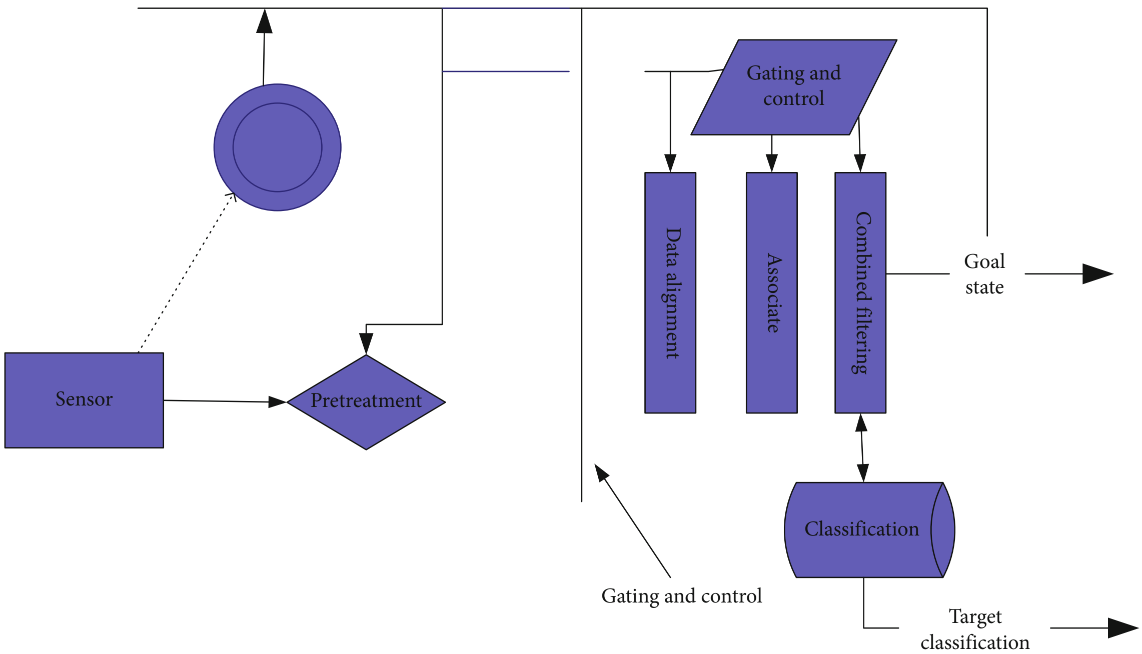

Figure 4: Data input/output data types.

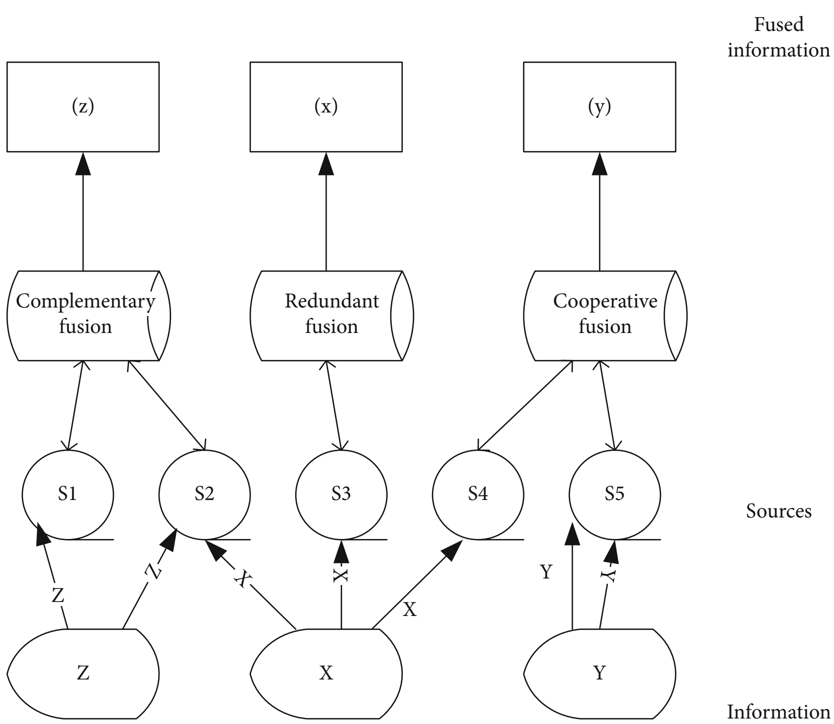

Figure 5: Three relationships between input data.

the prior distribution of group i are as follows:

$$P\left(X_j \middle| M^j\right) = \frac{P\left(M_j \middle| X_j\right) P\left(X_j \middle| M^{j-1}\right)}{P\left(M^j \middle| M^{j-1}\right)}, \tag{4}$$

wherein

(i) $P(M_j|X_j)$ represents the likelihood function, a measurement model based on a given sensor

(ii) $P(X_j|M^{j-1})$ represents the prior distribution function, a model of a given conversion system

(iii) Denominator $P(M^j|M^{j-1})$ is a standardized term that can guarantee the normalization of the probability density function

When the observation coordinates of the sensor group are consistent, the direct method can be used to fuse the sensor measurement data. In most cases, the sensor describes the same environmental object from different coordinate systems. At this time, the sensor measurement data should be fused by Bayesian estimation in an indirect way.

When the Bayesian method is used for multisensor data fusion, the possible decisions of the system are required to be independent of each other, in this way to treat these decisions as a division of the sample space [17]. Suppose the possible decisions of the system $M1, M2, \cdots, Mn$, when a sensor observes the system, the observation result Q is obtained, and if the prior knowledge of the system and the characteristics of the sensor can be used to obtain the prior probabilities $P(M_i)$ and conditional probability $P(Q/M_i)$, use the Bayesian conditional probability formula

$$P\left(\frac{M_i}{Q}\right) = \frac{P(M_i Q)}{P(Q)} = \frac{P(Q/M_i)P(M_i)}{\sum_{I=1}^{n} P(Q/M_i)P(M_i)}, i = 1, 2 \cdots, n. \tag{5}$$

According to the prior probability $P(M_i)$ of the sensor, it is updated to the posterior probability $P(M_i/Q)$.

This result is generalized to the case of multiple sensors. When there are A sensors, the observation results are A_1, A_2, respectively…, A_o; assuming that they are independent of each other and independent of the conditions of the observed object, then the total posterior probability of each decision in the system with O sensors can be obtained as-
$P(M_i/A_1 \wedge A_2 \cdots A_o) = \prod_{j=1}^{o} P(Q_j/M_i)P(M_i)/\sum_{k=1}^{n}\prod_{j=1}^{o} P(Q_j/M_i)P(M_k)$, $i = 1, 2, \cdots, n$.

Finally, the decision of the system can be given by certain rules. For example, the decision with the largest posterior probability is taken as the final decision of the system as shown in Figure 6.

2.1.4. The Data Fusion Algorithm Establishes a Human Body Motion Model, as Shown in Figure 7. Detection provides approximate information about the position of the human in the image, which can satisfy the needs of some applications; however, some applications, such as human-computer interaction, require finer information about the position of nodal points. The goal of monocular 3D human pose estimation is to recover the 3D coordinates of human nodes from a single image. The loss of depth information during imaging leads to a strong ambiguity in this task, and more preliminary work tends to reduce the ambiguity by introducing a priori information, such as anthropometric constraints, low-dimensional popular representations, or temporal smoothing constraints.

The coordinate system shown in Figure 7 above has three mutually perpendicular vectors. The vector change through any point in space will have a spatial sum vector. It is very appropriate to replace the acceleration in the three directions with a vector with both magnitude and direction. The calculation formula of the space vector is as follows:

$$\overset{\rho}{a} = x\overset{\rho}{i} + y\overset{\rho}{j} + z\overset{\rho}{k}. \tag{6}$$

The change of the acceleration parameter after the human body's motion returns. It is assumed that the acceleration in the three different directions is a_x, a_y, and a_z, because the assignment change of the acceleration vector can reflect the violent fluctuations of the human body's motion. It can be expressed by the following formula:

$$a' = \sqrt{a_x^2 + a_y^2 + a_z^2}. \tag{7}$$

As mentioned above, when we know the acceleration in three directions, we can get the change of human body posture according to the above formula. According to the human body coordinate system established in Figure 6, different angles of human body movement can be calculated, for example, when the human body is perpendicular to the angle α_1 of the ground:

$$\alpha_1 = \frac{\sqrt{a_x^2 + a_y^2}}{|a|}. \tag{8}$$

In the same way, the angle values in the other two directions can be obtained. According to the above formula, the angle values between different postures can be calculated, and the motion state of the human body can be judged whether it is violent [18, 19].

According to the formula, calculate the x-axis acceleration during movement.

Data analysis is shown in Figure 8.

In summary, the data fusion algorithm introduces the correlation technique of aerobic exercise in data fusion mainly with a multiobjective tracking application. The data sources and exercise record slices are described to construct a multimodal and self-supervised learning-based aerobic capacity model that can help in picture analysis, as well as self-monitoring of movements. The model consists of a human generalized aerobic capacity model, a personalized long-term aerobic capacity model, and a personalized short-term aerobic

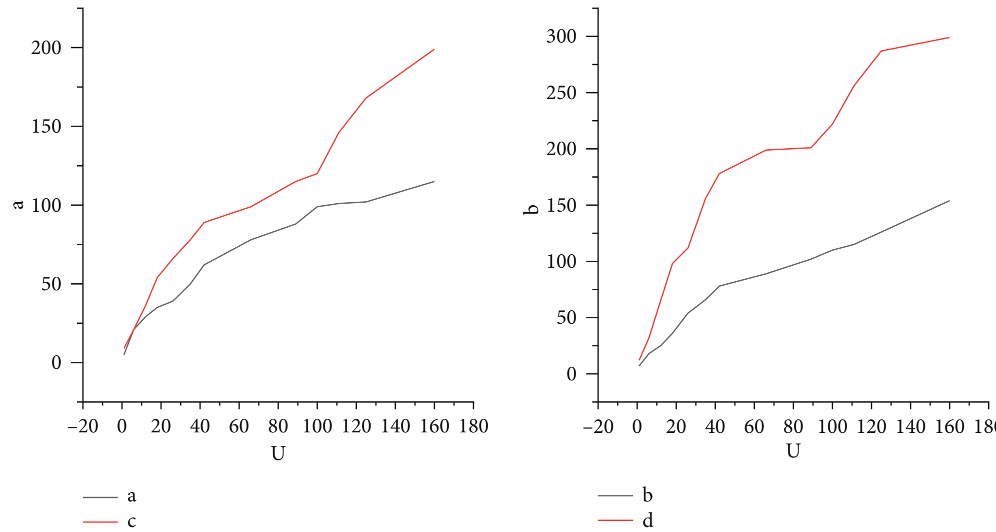

Figure 6: Decision with maximum posterior probability.

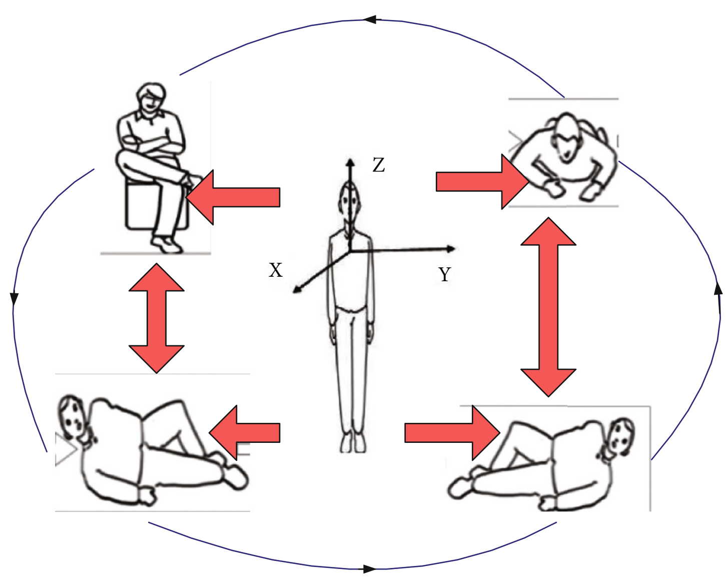

Figure 7: Three-dimensional coordinate system of human body space.

capacity model, and the components of the aerobic capacity model are trained one by one in a training manner, and both the personalized long-term aerobic capacity model and the personalized short-term aerobic capacity model are fixed with the model parameters being used as the components for subsequent model training after the training is completed.

2.2. Aerobics

(1) The display of aerobics action hands is shown in Figure 9

Aerobics movements are mainly composed of foot movements and hand movements.

There are five types of foot movements. Rhythmic pacing operations are mainly based on the free combination of foot movements in fitness gymnastics. Generally, one or two steps are selected for each unit to ensure the mobility and diversity of the operating unit. Each unit must combine at least three steps. There are alternate types such as walking and running; stepping types have side-to-side stepping and stepping and sucking legs; the fourth lifting type is like the form of suction-leg jumping and bending-leg jumping, and the last type is opening-closing jumping and split-leg jumping [20]. The step action of the exercise is mainly based on the free collocation and combination of the foot movements of aerobics. Generally, one or two steps should be selected for each exercise unit. In order to ensure the mobility and diversity of the exercise unit, at least three steps should be selected for combination.

When doing upper limb movements, the posture of the hand is variable, and the emotions of the body can be expressed in detail through the changes of different hand shapes. With the sagittal and longitudinal axes of the body

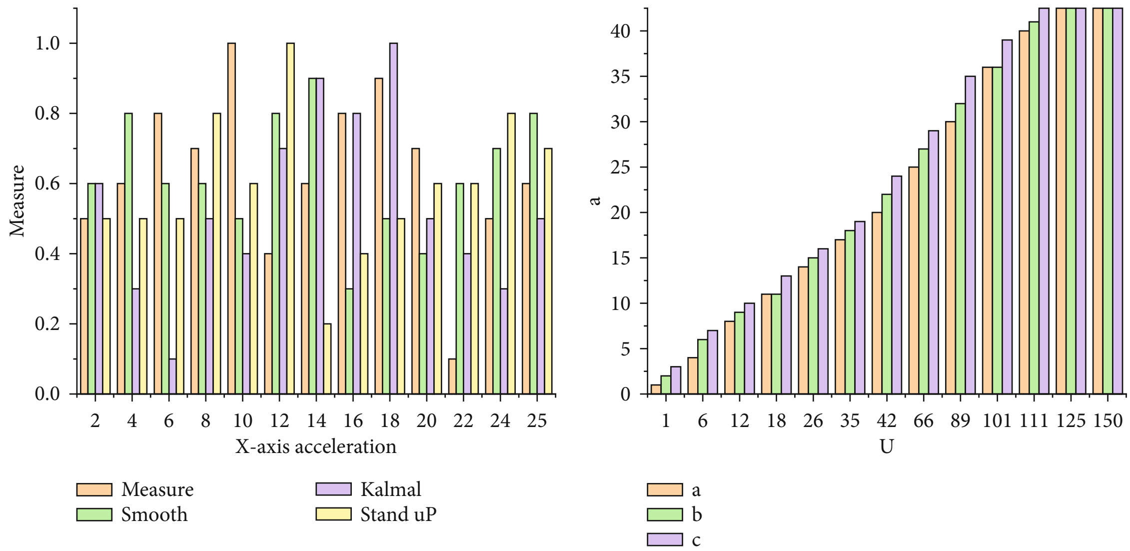

Figure 8: Acceleration.

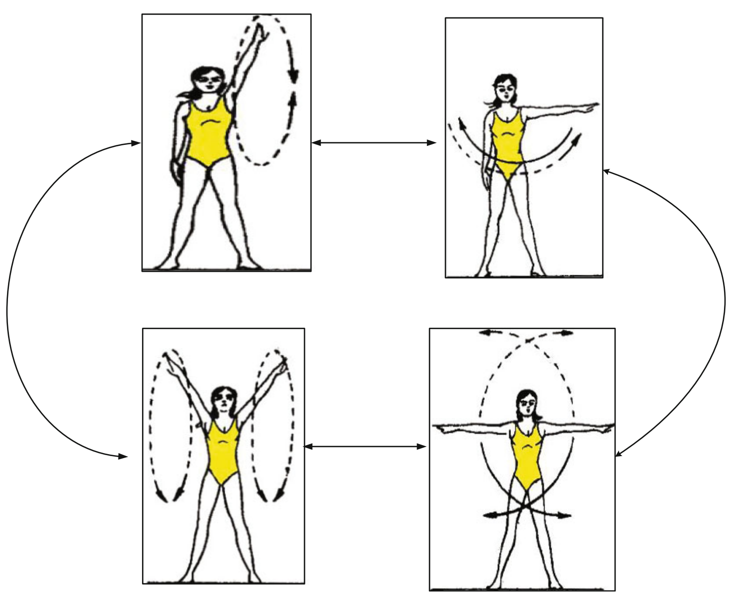

Figure 9: Different types of aerobics movements.

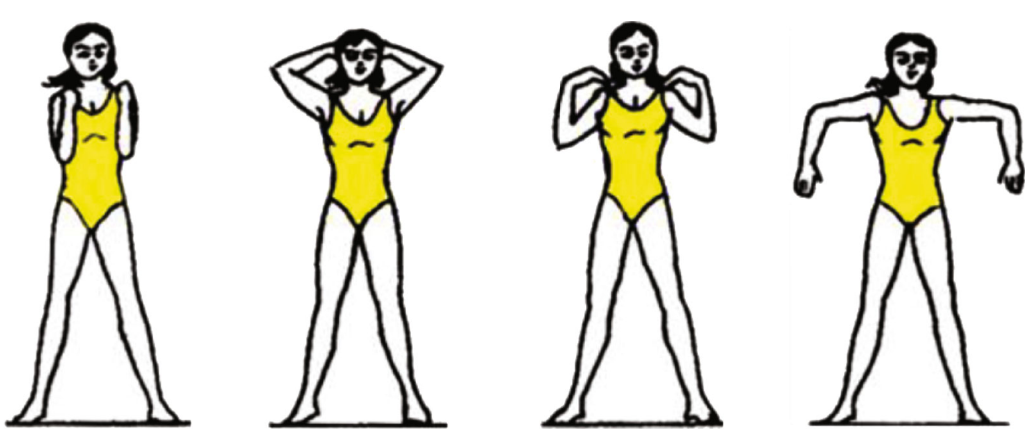

Figure 10: Movements in physical flexibility.

Figure 11: Movements to develop agility.

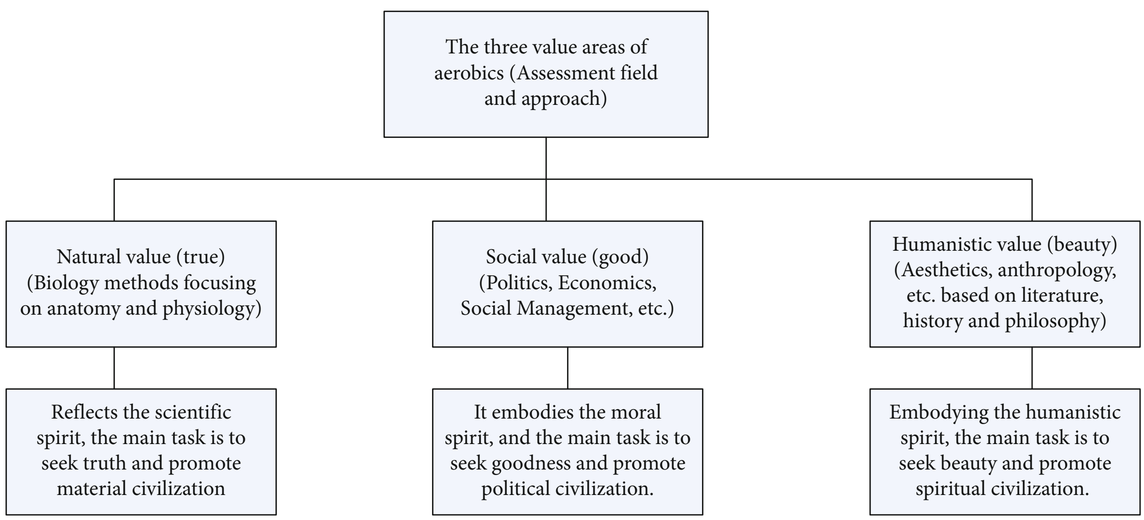

Figure 12: The value of creating aerobics courses.

Table 1: Comparison of different forms of aerobics.

	Traditional aerobics teaching	Design of aerobics course under data fusion
Content	The fixed routine is the teaching content, ignoring the individualized teaching of students	Stimulate interest in curriculum practice and cultivate a sense of innovation
Function	For the development of the body	All-round development
Organizational form	Emphasis on organizational unity, teachers instill knowledge in one direction	Flexible and diverse, combined with teaching
Evaluation method	Emphasizes absolute unity and focus on the evaluation of intermediary performance	Individualized and humanized evaluation based on different individual differences, focusing on the combination of evaluation process and results
Purpose	Learn to exercise, enhance physical fitness	Pay attention to cultivating practical innovation ability, establish correct weight reduction values, and form the consciousness and habits of lifelong sportsmanship

as the baseline and the horizontal plane of the shoulder as the midline, the movement of the arm can be divided into eight directions. The movements in each direction are straight, round, bent, forward, backward, up, and down. The creation of arm movements can be performed in various ways [21, 22]. The performance of the formation and route varies depending on the rotation surface. When the operating unit requires additional rotation, the creation of steps and arm movements needs to be coordinated without any setbacks or stagnation. Arm movements are combined with steps to achieve smooth coordination.

As mentioned above, the movements of aerobics are not only reflected in the hand movements, but also in the changes on the body. As shown in Figure 10, it mainly reflects the exercise of the legs with movements such as big kicks and suction jumps.

Figure 11 shows not only actions that reflect the quality of coordination, but also actions that develop agility and coordination.

This is the overall motion snapshot and slow motion alternately or four alternate motion combinations. For example, it connects two movements and four-shot movements: bend left and right legs, jump, wrap hands, and switch fingers [23].

(2) Why do we need to design aerobics creative courses? The reason is that aerobics is not only about strengthening the body. At the same time, aerobics has three value areas, namely, natural value, social value, and humanistic value. It shows the scientific spirit, moral spirit, and humanistic spirit from different discipline dimensions, which is aesthetically independent. Effective combination and reflection on a platform for evaluating value on the basis of sex are shown in Figure 12.

2.3. Create Aerobics Course Based on Sensor Network and Communication Data Fusion Algorithm

2.3.1. The Comparison of Aerobics between Tradition and Algorithm. The comparison of aerobics between traditional algorithms can be obtained through data search. The results are shown in Table 1.

3. Experimental Design and Result Analysis

3.1. Creative Curriculum Design

(1) In the process of creating aerobics, we must first perform sports training, because this is our most basic skills. When we practice the basic skills, master its effects on our fitness and the artistic influence of aesthetic appreciation, so in the fitness in the training of exercises, we must pay attention to the training of step fluency [24, 25]. In order to improve the fitness effect and fitness effect, design creative courses, realize the importance of fitness training, and actively improve aerobic exercise capacity, it is necessary to carry out smooth training methods. Table 2 shows the body coefficients of different postures.

(2) The use of algorithms for data analysis can derive the characteristics of the design of the aerobics creative curriculum. However, when measuring data, it is inevitable that the physiological signal will change due to factors such as power frequency interference and arterial waves in the real world. In addition, the area network signal is collected in an open scene, so it will inevitably be affected. These random noises will affect the collected physiological signal data and cause distortion and reduce the accuracy of the data [26, 27]. In order to ensure the accuracy and convenience of data fusion work, signal denoising should be done well, so it is very necessary to remove noise from the original signal

Denoising quantitative description: assuming that the signal length is S, the signal contaminated by noise (that is, the observed signal) is $\{f(i)\colon i = 1, 2, \cdots, S\}$, the original signal (to be restored signal) is $\{g(i)\colon i = 1, 2, \cdots, S\}$, and the noise is $\{\beta(i)\colon i = 1, 2, \cdots, S\}$. The following signal decomposition modes can be used for analysis:

$$f(i) = g(i) + \beta(i), (i = 1, 2, \cdots, S). \tag{9}$$

Second, the most common signal decomposition mode is multiplicative decomposition:

$$f(i) = g(i) * \beta(i)(i = 1, 2, \cdots S). \tag{10}$$

When we use the above methods for denoising, it is usually simulated as a multiplicative structure. The noise component $\beta(i)$ is independently and identically distributed in $S(0, \theta_n^2)$, and the purpose of denoising independently with $g(i)$ is to obtain an estimate $\widehat{g}(i)$ of $g(i)$ so that its mean square error (MSE) is the smallest, where

$$\mathrm{MSE} = \frac{1}{S^2} \sum_{i=1}^{S} (g\wedge(i) - g(i))^2. \tag{11}$$

In the region of small fluctuations, when using the orthogonal wavelet transform of the above 11 formulas, we can get the following:

$$X(i) = Y(i) + V(i), i = 1, 2, \cdots, S. \tag{12}$$

Among them, $X(i)$ is the noisy wavelet coefficient, $Y(i)$ is the no-noise wavelet coefficient, and $V(i)$ is the fluctuation area. After we use the data after the above algorithm fusion to design and analyze the aerobics creation course, we can use the following methods to quantify, and when the data X has mixed attributes, the difference between different bodybuilding actions D can be expressed by the following formula:

$$D(X_i) = \frac{\sum_{n=1}^{m} y_i^n d_i^n}{\sum_{n=1}^{m} y_i^n}, \tag{13}$$

where y_i^n represents the weight of n actions and d_i^n represents the data of the i-th sample in the data set X, and then, we can use the above formula to calculate the quantification of different types of actions [28].

Table 2: Body factor.

Name	Wi	Hierarchical total ranking weight W	Rank
Basic theoretical level	0.326	0.092	8
Creation theory	0.721	0.123	2
Aerobics technical skill level	0.09	0.022	3
Competitive aerobics technical skill level	0.333	0.163	5
Creative practice level	0.18	0.032	7
Knowledge level of related subjects	0.821	0.033	1
Music perception level	0.128	0.011	3
Music production and processing	0.128	0.854	8
Aesthetic sensibility	0.966	0.655	12
Aesthetic expression and creativity	0.833	0.721	7

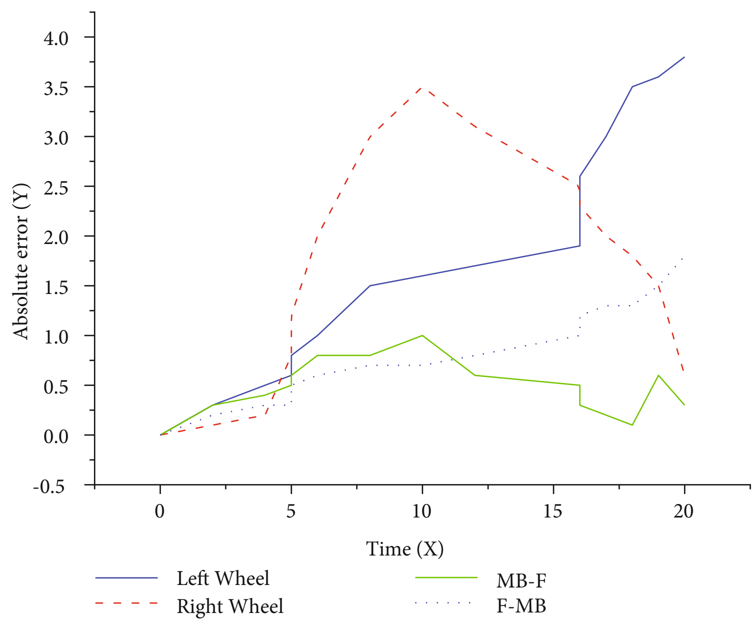

Figure 13: Expected value.

(3) Data fusion calculation has many evaluation criteria. When we use algorithms to quantify aerobics actions, indicators other than accuracy are convenient for us to verify

3.2. Evaluation Criteria for Data Fusion Algorithms. They are the average absolute error, the root mean square error, the average absolute percentage error, and the root mean square percentage error. The modified function is to evaluate the performance of the algorithm [29]. Suppose n is the number of individuals in the data collected this time, where yt represents the data fusion value and $y-$ represents different individual data.

(1) *Mean Absolute Error (MAE).* Use the following formula for calculation:

$$\mathrm{MEA}=\frac{1}{n}\sum_{i=1}^{n}\left|y_i^t-y_i^-\right|, n=1,2,.\cdots N \tag{14}$$

MEA uses absolute error, which can just eliminate the gap between data and can better reflect the true situation of data fusion algorithm error. The smaller the value of MEA, the closer the fusion value is to the true value.

(2) *Root Mean Square Error (RMAE).* Use the following formula for calculation:

$$\mathrm{REAM}=\sqrt{\frac{1}{n}\sum_{i=1}^{n}\left(\frac{y_i^t-y_i^-}{y_i^-}\right)^3} * 1000 \tag{15}$$

Table 3: Comparison of the test results of students' physical fitness standards before and after the experimental group.

Height	Before the experiment	80	160.79	5.21		
	After the experiment	80	160.03	4.88	0.07	$P > 0.05$
Weight	Before the experiment	80	55.86	6.97		
	After the experiment	80	55.3	7.22	0.09	$P > 0.05$
Standing long jump	Before the experiment	80	168.33	15.69		
	After the experiment	80	172.31	11.33	2.23	$P < 0.05$
Vital capacity	Before the experiment	80	2647.5	526.27		
	After the experiment	80	1847.73	565.36	0.87	$P < 0.05$
Jump rope	Before the experiment	80	123	6.54		
	After the experiment	80	130	7.98	0.04	$P > 0.05$
Step test	Before the experiment	80	44.26	4.18		
	After the experiment	80	46.82	6.33	0.92	$P < 0.05$
Flexibility ratio	Before the experiment	80	5	23.22		
	After the experiment	80	5	32.11	2	$P > 0.05$
Exercise frequency	Before the experiment	80	3	2.33		
	After the experiment	80	7	3.21	6.32	$P > 0.05$

The smaller the value of REAM, the closer the actual value of the aerobics teaching design course obtained.

(3) Mean absolute percentage error (MAPE)

$$\text{MAPE} = \sum_{i=1}^{n} \left| \frac{y_i^t - y_i^-}{y_i^-} \right| * \frac{1000}{n}, n = 1, 2, \cdots N \tag{16}$$

The smaller the value of MAPE, the better the similarity between the true value and the fusion result.

(4) Root mean square percentage error (RMSPE)

$$\text{RMSPE} = \sqrt{\frac{1}{n} \sum_{i=1}^{n} \left(y_i^- - y_i^t \right)}, n = 1, 2, \cdots, N \tag{17}$$

When the value we obtain is small, it indicates that the design of our integrated design scheme is more reasonable.

(5) Criterion function (CF)

$$\text{CF} = C_1 * \frac{P}{c} + C_2 * \frac{\text{RSS}}{c} + C_3 * \frac{\text{T}}{c} \tag{18}$$

In the above formula, P refers to the time required for the data fusion operation, RSS refers to the sum of the final true value obtained and the residual sum of squares after the fusion data, T refers to the variance of the target fusion value, and C_1, C_2, and C_3, respectively, refer to the weights of P, RSS, and T, which can be adjusted according to the expected values of different standard actions obtained. It represents the maximum value of the weight. Among them, the smaller CF value means that the algorithm produces accurate results with the smallest variance in the shortest time [30], as shown in Figure 13.

3.3. Teaching Design and Practice of Aerobics Based on Data Fusion Algorithm. Through the quantitative analysis of the teaching design of the aerobics creation course through the data fusion algorithm, the results can be obtained as shown in Table 3.

According to Table 3, it can be seen that there is a certain correlation between the algorithm-based technology and the aerobics curriculum creation and design. When the multiple data is stable and the variance is smaller, the physical indicators of the human body when actually performing aerobics are obtained. It is more accurate and provides different aerobics courses for different individuals, which is not only conducive to the creation of courses, but it can also innovate the courses to meet different sports objects. It can be said that the data fusion algorithm proposed in this paper, which uses variance as a measurement index and changes with the movement of the audience of different creative courses, has improved the efficiency of 20.23% compared with traditional course design in solving the problems of aerobics creative course design and practice.

4. Discussion

This article is dedicated to the research and design of aerobics creative curriculum design and practice model based on data fusion algorithm and applies it to the analysis and practice of personalized curriculum creation. Not only does the application range of data fusion algorithms extend to curriculum creation, but it is also the quantitative design of the actions of different personalized audience groups, and the application design concept of sensors is used to try new methods. Through the establishment of human body model, quantitative analysis, behavior simulation, mining data fusion algorithm as an important tool for the study of individualization and difference, has a certain potential in the complexity of curriculum design. In addition, there are already research foundations of creative curriculum design at home and abroad. In this paper, the research of creative curriculum is introduced into aerobics, the model is improved, and the data fusion algorithm makes the model suitable for the design and application of aerobics creative curriculum. For the research of data fusion algorithm, this article starts with the most basic algorithm, analyzes the error between the data calculated by the algorithm and the crowd that is different from reality, finds the model that is most suitable for the crowd, and controls the variance to ensure that the quantitative data is more accurate. Make the research results in line with the actual situation. And in the comparison of recall and accuracy observation, it is found that the increase in recall makes the detection condition loose, which affects the accuracy and thus makes the accuracy decrease. The good thing is that the higher recall of the algorithmic method can ensure that a better accuracy is obtained.

Through the analysis of this article, it shows the use of algorithms to build human body models of various data indicators of human movement, and the creation of curriculum design schemes for different groups of people is more innovative than traditional courses. Curriculum designers can face different audiences. For targeted teaching, various sports data can also be recorded and adjusted in time. In this way, the experience of different audiences can be improved, and the creative ability of course designers can also be improved.

5. Conclusions

Through case analysis, we draw important conclusions: in general, the smaller the variance, that is to say, the smaller the gap between the model establishment of the data and the actual movements, and the creation of aerobics courses is more suitable for the masses, compared to traditional courses. Editing is more universal, but this is not absolute. When the variance becomes smaller and smaller, there will be a smaller gap, and the data will be more quasi-group, but when it exceeds a certain limit value, it may also change the actual gap. Big possibility, not that the smaller the data, the better. This requires the designers of different creative courses to make timely adjustments based on the responses of the practitioners and use data fusion algorithms to improve efficiency, cultivate innovation awareness, and promote the all-round development of people.

Data Availability

No data were used to support this study.

Conflicts of Interest

The author states that he has no conflict of interest.

Acknowledgments

This work was supported by the Neijiang Normal University 2020 Online first-class undergraduate courses of general education, JK202056.

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