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Research Article

Construction of Selection and Evaluation Algorithm for High-Level Tennis Students in Colleges and Universities Based on Random Matrix Model

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The evaluation method of tennis students' ability has an important influence on optimizing the selection and training of high-level tennis students. Based on the random matrix model theory, this paper constructs an evaluation algorithm for high-level tennis students in colleges and universities. Based on the literature and expert opinions, the model selects professional technical ability, knowledge learning ability, comprehensive development ability, and sustainable development ability as weighting factors and constructs the ability evaluation index system for high-level tennis students in colleges and universities. During the simulation process, the visualization system uses springboot, mybatis, and shiro as the back-end development framework to realize the modules of matrix management, role management, resource management, grade management, course management, student management, model management, etc. It adopts the MATLAB software platform to construct that the tennis learning evaluation includes 6 first-level indicators and 24 second-level indicators. The experimental results show that the final weights of the first-level indicators of tennis learning evaluation are as follows: tennis specific quality is 0.15, tennis sports skill is 0.3, tennis theoretical knowledge is 0.1, progress score is 0.15, attitude to learning tennis is 0.2, emotional performance and the spirit of cooperation is 0.1, and the results are visualized, which effectively improves the effectiveness of the random matrix algorithm in the field of selection evaluation.

1. Introduction

While the demand for high-level tennis students in colleges and universities is increasing day by day, the regional evaluation situation is also becoming increasingly severe. The society and employers have gradually increased the requirements for high-level tennis students, putting forward higher requirements for college students' comprehensive ability, and also for high-level tennis students. The evaluation standard of ability puts forward higher requirements [1–4]. There are many researches on the development of higher education, such as the analysis of the correlation between higher education and regional economic development, the study of the difference in foreign higher education, the analysis and research of the allocation of higher education resources in various regions, the comparison of the relative cost of higher education, and the decision-making of education investment [5–7]. One aspect of the connotation of the balanced development of higher education is that higher education institutions and educated persons allocate higher education resources in a relatively balanced manner in higher education, so as to achieve a relative balance between higher education demand and satisfaction, and finally implement it in the government and higher education. The research direction of this paper is mainly the development of higher education scale and the guarantee of teaching quality [8–11].

By studying the role of training skills of high-level tennis students on their evaluation market, Tian et al. [12] believed that training level has an important impact on the evaluation direction and quality of high-level tennis students in colleges. Taraszkiewicz and Koch [13] conducted relevant research and analysis on the relationship between "job satisfaction," "job quality," "life satisfaction," and evaluation quality, but by consulting the literature, it can be seen that the research object is mainly for a certain group of workers, not college freshmen. Hodges et al. [14] used the index of segment scoring rate and processed the index of segment usage rate to analyze the competitive performance of high-level tennis students in tennis matches. On the technical level, Varga et al. [15] believe that, in tennis competitions, the scoring rate of the stalemate on serve needs to be improved, and the competitive performance at this stage affects its competitive performance to a greater extent; on the tactical level, when the technical level remains unchanged, the high-level tennis students increase the utilization rate of the return and serve stalemate, drag the return and serve game to 4 shots, and conduct multiround competition, which has higher practical value for their competitive performance. According to the evaluation requirements of students' ability, the researchers constructed the evaluation index system of college students' ability, including seven first-level indicators such as work and salary, and refined them into ten second-level indicators. According to the relevant factors affecting the cultivation of high-level tennis students, scholars select the index system from the two aspects of individuals and schools, enriching the index system for the cultivation of high-level tennis students, and providing a rich reference basis [16, 17]. At the same time, it puts forward the analysis of college students' ability based on fuzzy comprehensive evaluation method, takes it as an example to discuss the students' ability of college students, builds a reasonable evaluation system, uses the fuzzy comprehensive evaluation method to construct the evaluation model of college students' ability, and evaluates the students' ability of college students. Overall, multidimensional evaluation is given by educational background and subdiscipline [18–21]; some scholars have proposed the design and implementation of the quality and system of college student evaluation based on the hierarchical method, to model and complete the high-level tennis student evaluation information management system [22–25].

According to the characteristics of students' ability evaluation, this paper selects the random matrix algorithm as the basis for constructing the evaluation model. The random matrix algorithm has many advantages for students' ability evaluation. First, the algorithm itself can optimize the weak classifier and improve the classification ability and evaluation ability. Secondly, in the process of generating decision trees, each decision tree is generated independently and simultaneously, which improves the training efficiency. In addition, the random selection of features when selecting samples and constructing a decision tree greatly improves the antinoise ability of the algorithm. The main purpose of this paper is to promote the development of intelligent education through the research on students' abilities and to explore a new teaching mode based on random matrix. The evaluation model designed in this paper starts from the students' performance in school and divides the ability evaluation indicators of college students according to the requirements of regional engineering certification and designs a new student ability evaluation model on this basis. The main method is to digitize each ability, analyze the relationship between the above five ability aspects and the evaluation situation (postgraduate entrance examination, civil servant examination, work unit) from the previous student data, and use machine learning to form a relationship model.

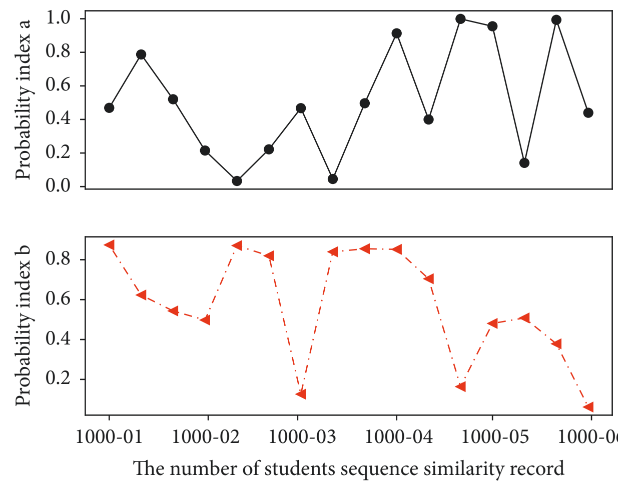

Figure 1: Spatial similarity distribution of random matrix model.

2. Construction of an Evaluation Algorithm for High-Level Tennis Students in Colleges and Universities Based on Random Matrix Model

2.1. Spatial Distribution of Random Matrix Model. Sort all the matrices of the matrix according to the calculated matrix and the random matrix degree of the matrix from high to low, and select the Top-K matrix with the highest degree of random matrix according to the fixed value method. The value method delimits the matrix greater than or equal to the random matrix degree IU value as the most evaluation matrix of the matrix. In order to connect the two measurement methods, the learning of the matrix eigenvectors in this section is obtained by the decomposition of the matrix scoring matrix R and the matrix evaluation matrix D. The matrix feature matrices in the matrix scoring matrix and the evaluation matrix share the dimension space.

$$U(x,i) = (u(x,i), u(x,i-1), u(x,i-2), \ldots, u(x,2), u(x,1)). \tag{1}$$

The recommendation method based on random matrix recommends the items that the evaluation matrix likes to the target matrix according to the inferred matrix and the random matrix relationship of the matrix. Generally speaking, the recommendation method based on random matrix is also divided into three steps: first, infer the random matrix relationship between the matrix and the matrix; secondly, filter out the user's most evaluation matrix set; finally, predict the preference of the matrix and make a recommendation.

$$\begin{cases} X[t,t-1] > ft(i,i-1), \text{if}[f(i) > f(i-1)], \\ X[t-1,i] > ft(i-1), \text{if}[f(i) < f(i-1)]. \end{cases} \quad (2)$$

In the random matrix model space, f and x are, respectively, defined as the dimensional hidden factor eigenvectors of the evaluation matrix. Excessive emphasis on the performance of a certain indicator will affect the development level of other indicators, and the effective connection between the tennis movement speed indicators will be destroyed. Therefore, the principle of differentiated treatment should be adopted according to the individual situation of each student. When optimizing the movement speed quality training of tennis students, attention should be paid to the balanced development of various physical fitness indicators. The prediction of Figure 1 can be made for the evaluation relationship between the matrices.

Except for the ski data set with a small matrix cardinality, other data sets are based on the CSR algorithm with the simplest evaluation structure, and the time efficiency of the evaluation matrix operation is high. The reason is that the time efficiency of the evaluation matrix operation depends on the solution evaluation efficiency of the evaluation matrix, and the decoding efficiency of the simple evaluation structure is relatively high. The main reason why CSX, a relatively new algorithm proposed by CSR series, does not have advantages in evaluation rate and solution evaluation efficiency is that the large-scale data matrix of most machine learning models does not have many horizontal, vertical, and diagonal lines, etc. The evaluation rate of general evaluation software is relatively stable. For matrices with different sparsity, the evaluation rate does not change much.

$$\begin{aligned} &f(\min(x), \max(x), \max(x) - \min(x)) \\ &= \{p(x), p(x-1), \ldots, p(1)\}. \end{aligned} \quad (3)$$

The heavyweight evaluation software Gzip and Bzip are maintained between 10% and 40%, and the lightweight evaluation algorithm Snappy is maintained at 20% to 70%. The algorithm can achieve an evaluation rate between 2% and 50% by adapting to the characteristics of the matrix data set. For large-scale data matrices with a small column base and a much larger number of rows than the number of columns, the algorithm is well implemented for machine learning models.

2.2. Level Recognition of Tennis Students. The process of student ability evaluation is to select students with the best comprehensive quality from various indicators of student performance in school. The proportion of each index point in student evaluation is different, so the data in student ability evaluation can be regarded as right and wrong. After comparing and analyzing this value with the actual performance of the students, a scientific diagnosis is made, which is convenient for teachers to understand the strengths and weaknesses of each student's tennis movement speed quality in time, so that teachers can combine the actual situation of each student. Reasonable optimization and scientific quantitative combination of training methods can improve the quality and benefit of tennis training students' movement speed quality training. Since the random matrix algorithm uses the average voting mechanism for the classifier, the voting mechanism makes the weak classifier affect the final evaluation result. The matrix algorithm weights the classifiers to reduce the influence of weak classifiers on the results.

$$p(n, n-m) = \begin{cases} \dfrac{1 - n * n}{1 + n * n - m}, \\ \dfrac{1 + n * n}{1 - n * n - m}. \end{cases} \quad (4)$$

The solution evaluation efficiency of the series of sparse matrix evaluation algorithms is high, and the evaluation rate is low or even unable to produce the evaluation effect. Compared with the general evaluation software, the comprehensive evaluation rate and the evaluation matrix operation efficiency have better comprehensive efficiency and random matrix. Compared with the supported CSR series of sparse matrix evaluation algorithms, the series of sparse matrix compression algorithms can achieve a good compression rate on the large-scale data matrix of the model in Figure 2 and can better balance the evaluation rate and solution evaluation efficiency.

The hierarchical distribution of tennis students constructs a certain evaluation function according to the characteristics of constraints and adds the evaluation function to the objective function, so that the solution of the constrained optimization problem can be transformed into the solution of the unconstrained optimization problem. In the process of establishing the decision tree model, on each node, an optimal attribute is selected according to the node splitting method, and then the branches of the tree are established according to the different attribute values, and the above process is repeated in the lower nodes until each node reaches a locally optimal state. The samples of leaf nodes belong to the same category. A random matrix is read-only and cannot be changed, so performing both types of operations on a random matrix will not change the original random matrix.

$$lirsirt(x, y) = \frac{\sum x + y(x) - y(1 - x) - \sum y(x) + xt}{1 - \sum y(x) + xt}. \quad (5)$$

The random matrix evaluation method can be divided into external random matrix evaluation method (also called external point method), internal random matrix evaluation method (also called internal point method), and hybrid method. In this paper, the external random matrix evaluation commonly used in evolutionary computing is used. The key to the random matrix evaluation method is to design a reasonable random matrix evaluation, so as to avoid overevaluation or underevaluation of constraints and reduce the global optimization ability of the algorithm.

2.3. Classification of Evaluation Indicators for Selection. On the basis of the random matrix model, combined with the literature data, the algorithm step basis was designed,

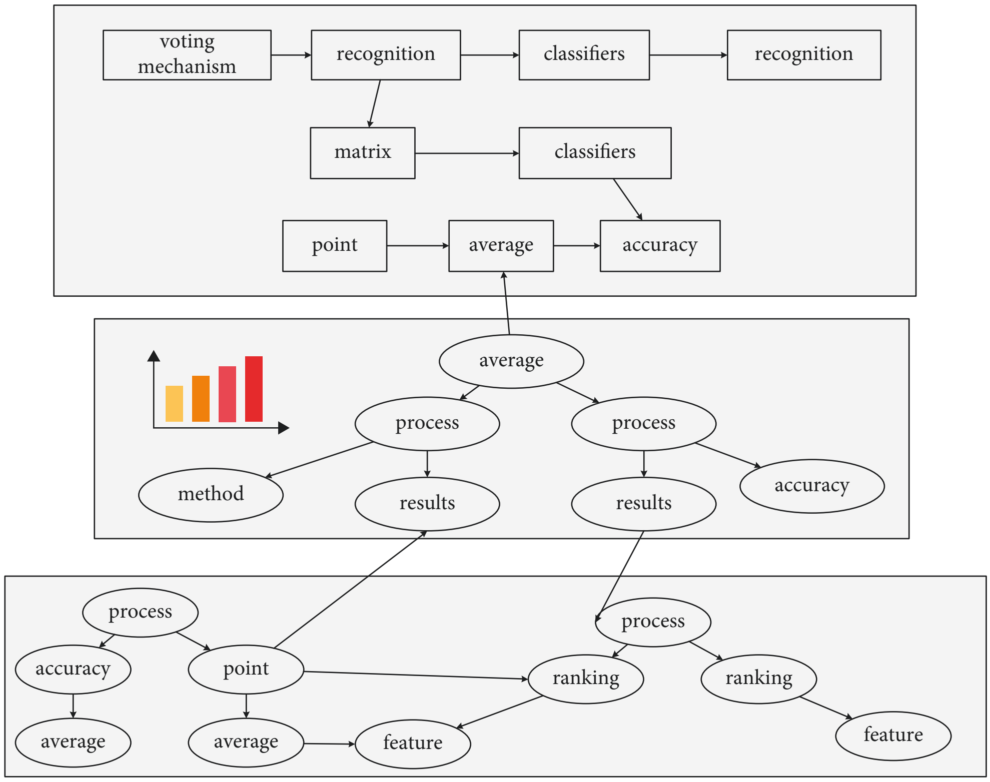

Figure 2: Series of sparse matrix evaluation process.

Table 1: Classification of evaluation indicators for selection.

Number	Classification of evaluation	Selection code text
Input	Indicators $u(x)$ determined	Import numpy as np
Step 1	Primary beta (x) secondary	Import matplotlib.pyplot as plt
Step 2	Basis $f(x) - x$ was designed	Data = np.array([20, 50, 10, 15, 30, 55])
Step 3	$u(x) - xt$	Pie_labels = np.array([“*A*,” “*B*,” “*C*”])
Step 4	For the selection indicators	Norm = colors.Normalize()
Step 5	The algorithm step $xt < t$	Plt.contourf(*X*, *Y*, *Z*, 100, cmap = “bugn”)
Step 6	On the basis of alpha (x, y)	Cset = plt.contourf(*X*, *Y*, *Z*, cmap = “hot_*r*”)
Step 7	Matrix model gist $(x - y)$	Alpha = 1, v min = 0.0017, v max = 0.0040
Step 8	The literature data $u(s)u(t)$	V min = 0.0017, v max = 0.0040
Step 9	Combined with $xy - x$	*X*, *Y* = np.meshgrid (*x*, *y*)
Output	The random bert (x)	*Z* = np.mat(an)

and 6 primary indicators and 25 secondary indicators were determined for the primary selection indicators. We design a questionnaire about students' attitudes towards the implementation of the evaluation system, compare the two learning evaluation systems, and verify the feasibility and operability of the new evaluation system as well as the existing problems. Therefore, the tennis speed quality training system has obvious dynamics; according to the established performance evaluation model, after each training stage, teachers should test the various movement speed quality indicators of the specialized students and predict the value that the specialized students should achieve according to the test results. A total of 39 questionnaires were distributed, 37 were recovered, and 37 were valid which is 95%, and the effective rate is 100%.

The random matrix selection evaluation index experimental platform used in this paper is built on the algorithm in Table 1. The CPU model is Intel Core i74700MQ, the memory is 8 G, the hard disk is 1 T, and there is a 256 G solid-state hard disk. The operating system is Ubuntu16.04 (64 bit), and random matrix with version 1.5.1 is installed on it. In order to make the hardware conditions of the random matrix experimental platform and the MATLAB experimental platform consistent, this paper selects the random matrix in standalone mode and conducts experiments on it.

$$\text{recall}(s(x), t(x)) = \frac{t(x) - t(x-1)}{1 - t(x)} - \frac{t(x) + t(x-1)}{1 + t(x)} - s(x). \quad (6)$$

The program code is written in Python, and the IDE used is PyCharm. The data under the random matrix experimental platform is calculated in parallel using 4 processor cores. Based on the processing results of the test tennis students' moving speed score data, according to the principle of normal distribution and the percentage of grade distribution, a parabolic equation is used to convert the normal distribution measurement raw data to a progressive integral evaluation method and establish each test index. As can be seen from these time performance comparison graphs, it takes a significant amount of time to generate an improved random matrix model and classify the test data set using the training dataset on MATLAB, while on the random matrix platform these times are reduced on average 10 times, increasing the rate of classification.

The matrix can explicitly control two aspects of the random matrix, one is persistence, and the other is partitioning. Figure 3 shows which random matrix they want to reuse and how to store the random matrix. The matrix can usually also store the data records in a random matrix separately between different machines according to the key value of the records in a random matrix. As shown, the data of each random matrix can be stored separately on different machines in the form of block according to the recorded key value, and those random matrices that will be reused can be stored in a caching strategy.

$$\begin{aligned}\text{Aertisr}(tn(x), tm(x)) = \prod \frac{t(x)}{1-t(x)} - 1 - t(x) \\ - \prod \frac{tm(x)}{1-tm(x)} - 1 - tm(x).\end{aligned} \tag{7}$$

Also, since the teaching contribution obtained according to the evaluation system is quite different from the data dimension of the public service index, the data is first normalized. The residual graphs of teaching contribution and public service index are obtained through MATLAB, as shown in paper. For the teaching contribution, the similarity between the high-level tennis student sequence obtained by the system and the high-level tennis student sequence obtained by the questionnaire is 0.345; the similarity calculated for the public service index is 0.734. Overall, the availability of the evaluation index, teaching contribution, and service index in Figure 4 are ideal, in which the evaluation index, teaching contribution, and public service index perform well in various indicators, even in the residual simulation. The verification results on the R-square of the composite curve and the slope of the residual fitting curve are not as good as other indicators, but the Levenshtein distance is 0.772 which also shows that the evaluation index has good usability.

The second verification method of the evaluation index of selection is based on the improvement of the first test. The same motion trajectory means that the same number of discrete points is obtained by subtracting the curve with a smaller threshold from the curve with a larger threshold corresponding to the X-axis. By performing curve fitting on these discrete points, the slope K of the obtained curve should be equal to 0. If the motion trajectories of the two curves are similar, the slope of the curve obtained by the subtraction fitting of discrete points is close to zero. If and only if the slope is closer to 0, it means that the motion trajectories of the two curves are more similar; that is, the results obtained through the evaluation system and the questionnaire are very similar.

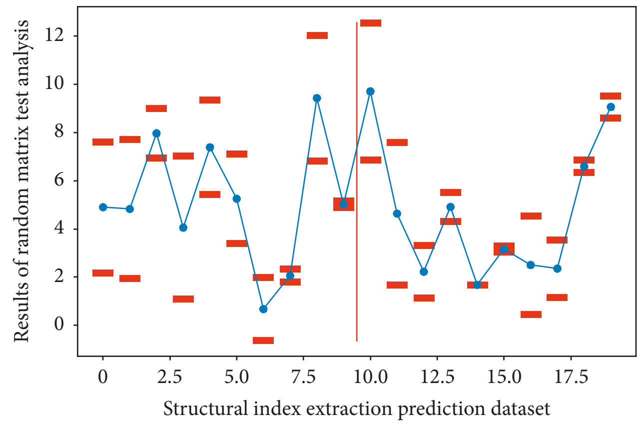

Figure 3: Random matrix prediction dataset test.

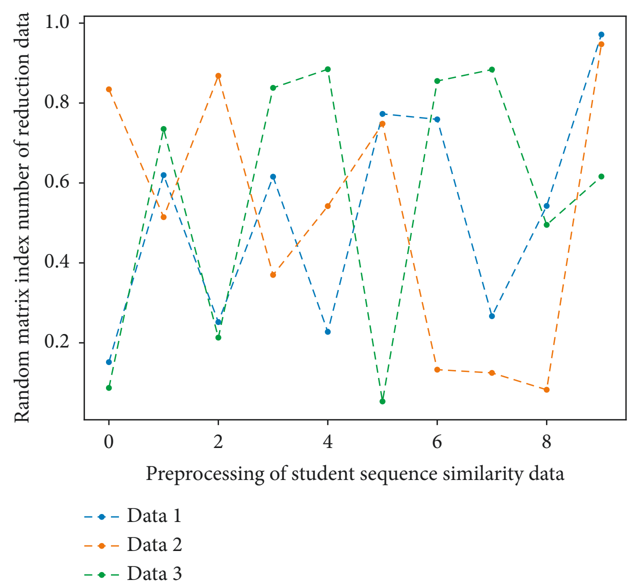

Figure 4: Random matrix index student sequence similarity distribution.

3. Analysis of Evaluation Index Components

The reliability test of the evaluation index components: the expert questionnaires were distributed twice, and there was a two-week interval between the first and the second questionnaires. We can intuitively and accurately determine the scores of tennis students in each index through individual scoring and comprehensive scores and evaluations of tennis students' movement speed quality indicators. However, if we do not establish the grading standards for the individual items of movement speed quality and comprehensive physical fitness of tennis students, it is impossible to scientifically judge the level of tennis students in the individual items of movement speed quality and comprehensive physical fitness. Experts' comments have revised the survey indicators. Through the method of qualitative evaluation of the questionnaire, the importance of each index from high to low is 5, 4, 3, 2, 1, and the structure and content of the questionnaire are verified; 91.7% of the experts believe that

Table 2: List of evaluation index components.

Evaluation index	$X1$	$X2$	$X3$	$X4$
Level 1	0.86	0.29	0.16	0.27
Level 2	0.43	0.24	0.83	0.59
Level 3	0.49	0.27	0.28	0.80
Level 4	0.97	0.59	0.40	0.46
Level 5	0.63	0.80	0.86	0.62

the questions listed in the questionnaire can comprehensively and objectively reflect the content to be studied, indicating that the questionnaire is effective and meets the requirements for validity.

$$\operatorname{gist}(x, y) = \begin{cases} \dfrac{xy}{1+xy}\operatorname{gist}(x-y)\operatorname{gist}(y-x), \\ \\ \dfrac{1-xy}{xy}\operatorname{gist}(x)\operatorname{gist}(y)-1. \end{cases} \tag{8}$$

Y is highly correlated with $X1$, $X2$, and $X3$, but not significantly correlated with $X4$. Combined with the content analysis of the tennis specific indicators, although the correlation between $X4$ and the set point difference Y is unreliable, it does not mean that the value of its indicators is not important, but in the multifactor relationship, its changes have no significant effect on the point difference. The correlation between $X2$ and Y is the highest, which shows that the score difference of high-level tennis students is significantly affected by the scoring rate of the serve stalemate. Improving the index of this stage has a more significant effect than improving the index of other stages. The one-sided significance test for $X1$, $X2$, and $X3$ is all less than 0.05, and there is a correlation. The Sig (1-tailed) value of $X4$ is $0.068 > 0.05$; the correlation is not obvious, which is in line with the results of the above coefficient test.

Since the scores obtained according to Table 2 and the evaluation obtained by the questionnaire are different in their dimensions, this study uses the data obtained in two different ways to sort by score or by high-level tennis students, so that even if the dimensions of the data are different, the relative order of sorting in their respective closed loops should be very close. If the ranking of the results obtained by the two methods is similar, it means that a certain dimension of the ability evaluation system for high-level tennis students has better effectiveness.

$$\begin{aligned} &\operatorname{ferte}(\operatorname{mean}(s), \operatorname{recall}(s)) \\ &\quad - \frac{\int \operatorname{gist}(x)\operatorname{gist}(y)\mathrm{d}x\mathrm{d}y - \int \operatorname{gist}(x) - \operatorname{gist}(y)}{\int \operatorname{gist}(x-y)} = 0. \end{aligned} \tag{9}$$

In the total error between the actual value and the average value, the regression error and the residual error are negatively correlated, so the regression error is a positive measure of the fitting degree of the linear fitting model. And because this fitting adopts interpolation approximation 3, its advantage is that R-square is equal to 1; that is, 100% of all discrete points are fitted; it fits all discrete points 100%; a function expression cannot be obtained to represent the function image.

In the evaluation index, recall represents the recall rate, and precision represents the precision rate. First, we input the data of the validation set in Figure 5 into each decision tree, and then each decision tree will have a category prediction for each record in the validation set, and we compare the predicted results with the real results according to the decision tree. This model passes the test to a very significant level. From the results of the regression equation, it can be seen that there is a correlation between the results of the “fan run” and the test results of the four moving speed training methods, which highlights the practical needs of the characteristics of tennis. For tennis students, the selected training methods and indicators are scientific and actionable. Finally, after quantifying each ability, the relationship between the above five ability aspects and sustainable development ability is analyzed through the previous student data, and a relationship model is formed after machine learning is used to evaluate students’ ability.

4. Results and Analysis

4.1. Random Matrix Data Preprocessing. The random matrix data in this paper is collected from student information, including more than 40 fields and more than 5000 pieces of student evaluation information, including institution code, name, type, student ID, name, political outlook, major code, major, place of origin, class, etc. Here, the paper is used to filter out irrelevant fields and delete all the fields that remain. Through the comparative analysis of each score segment of high-level tennis and the control class, a histogram of each score segment is established. It can be seen that the highest scores of the control class appear in the 0.6–0.8 score segment and the 0.5–0.6 score segment is more than the 0.55–0.59 score segment, and the distribution of scores is not concentrated enough. Peak distribution: the highest peak of high-level tennis performance appears in the 0.6–0.7 score segment, which decreases from the middle to both sides. The entire score distribution tends to be a normal distribution, showing the characteristics of large middle and small ends and left and right symmetry. Therefore, this work attempts to alternately combine the features of one task into the training process of another task to improve the performance of the two tasks, and each task only optimizes the loss of its own task during training. In order to complement the features of the two networks, a feature interaction module is designed for the two tasks in this chapter (Figure 6).

The first-level indicators of the learning evaluation system for tennis optional courses in ordinary colleges and universities include theoretical knowledge of tennis ($X1$), emotional performance and spirit of cooperation ($X2$), tennis specific quality ($X3$), progress score ($X4$), tennis learning attitude ($X5$), and tennis skills ($X6$); according to the relative importance assigned by more than 70% of experts for each indicator, the relative importance level values are determined as 1, 1, 2, 2, 3, and 5 respectively. Tennis theoretical knowledge evaluation indicators, progress

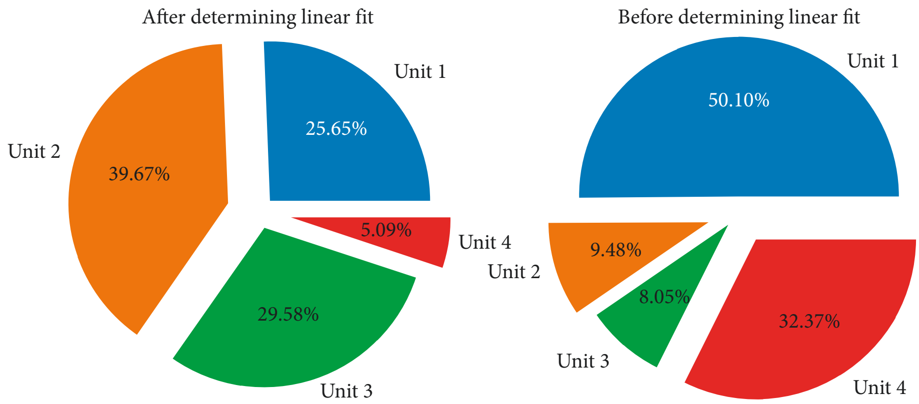

Figure 5: Determination of linear fit dimensions for random matrix data.

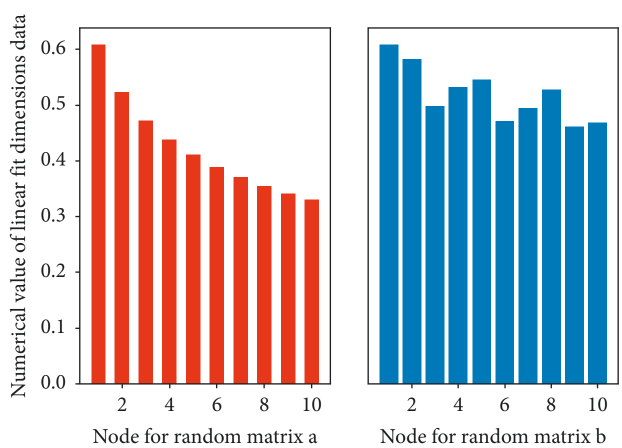

Figure 6: Histogram of random matrix data.

performance evaluation indicators, and tennis learning attitude evaluation indicators are all over 85%.

$$\begin{cases} u(s-1,t) = c(t-1)u(s-1)u(t) + u(s+1)u(t), \\ u(s,t+1) = u(s)u(t) + c(t)u(s+1)u(t+1). \end{cases} \tag{10}$$

The segment efficiency index = segment score rate × segment usage rate, so it can be concluded from model that, under the condition that the technical level of high-level tennis students does not change, the usage rate in the serving segment will have a higher score difference impact, followed by the usage rate of the serve stalemate segment. Affectionate performance and cooperative spirit also reached 78.6%. Although its evaluation index was relatively low compared with the other five evaluation indexes, 11 of the 14 experts agreed with the approval of this index. Through the above research and analysis, the results show that experts and teachers agree with the selection of the first-level indicators.

4.2. Simulation of Selection Evaluation of High-Level Tennis Students in Colleges and Universities. According to the requirements of high-level tennis student qualification certification, the measurement methods for the six secondary index points are different, but according to the requirements of the evaluation project, we need to quantify all the indicators uniformly. According to the different characteristics of each item of data, combined with the methods above, all the index points in this paper are quantified. According to some studies, this paper finds that these two tasks are complementary to some extent in addition to some common information. In some difficult examples, we may not get better results by directly detecting salient objects. However, these samples can use edge and other features to obtain better target contours in target contour detection.

$$\mathrm{Cerbert}(\mathrm{bert}(x) - \mathrm{bert}(y)) = \overbrace{\max(\mathrm{bert}(x), \mathrm{bert}(y)),\ \min(\mathrm{bert}(x), \mathrm{bert}(y))}^{x,y<1}. \tag{11}$$

The weight coefficients of the first-level indicators are tennis theoretical knowledge $q1 = 0.0912 \approx 0.10$; affection performance and cooperative spirit $q2 = 0.0912 \approx 0.10$; tennis specific quality $q3 = 0.1429 \approx 0.15$; progress score $q4 = 0.1429 \approx 0.15$; tennis learning attitude $q5 = 0.2143 \approx 0.20$; tennis skill $q6 = 0.3168 \approx 0.30$. The calculation method for determining the weight of the second-level indicator is the same as that for determining the weight of the first-level indicator.

The data collection database system of the tennis student sports big data analysis platform includes six parts of data in Figure 7: school-related data, college major-related data,

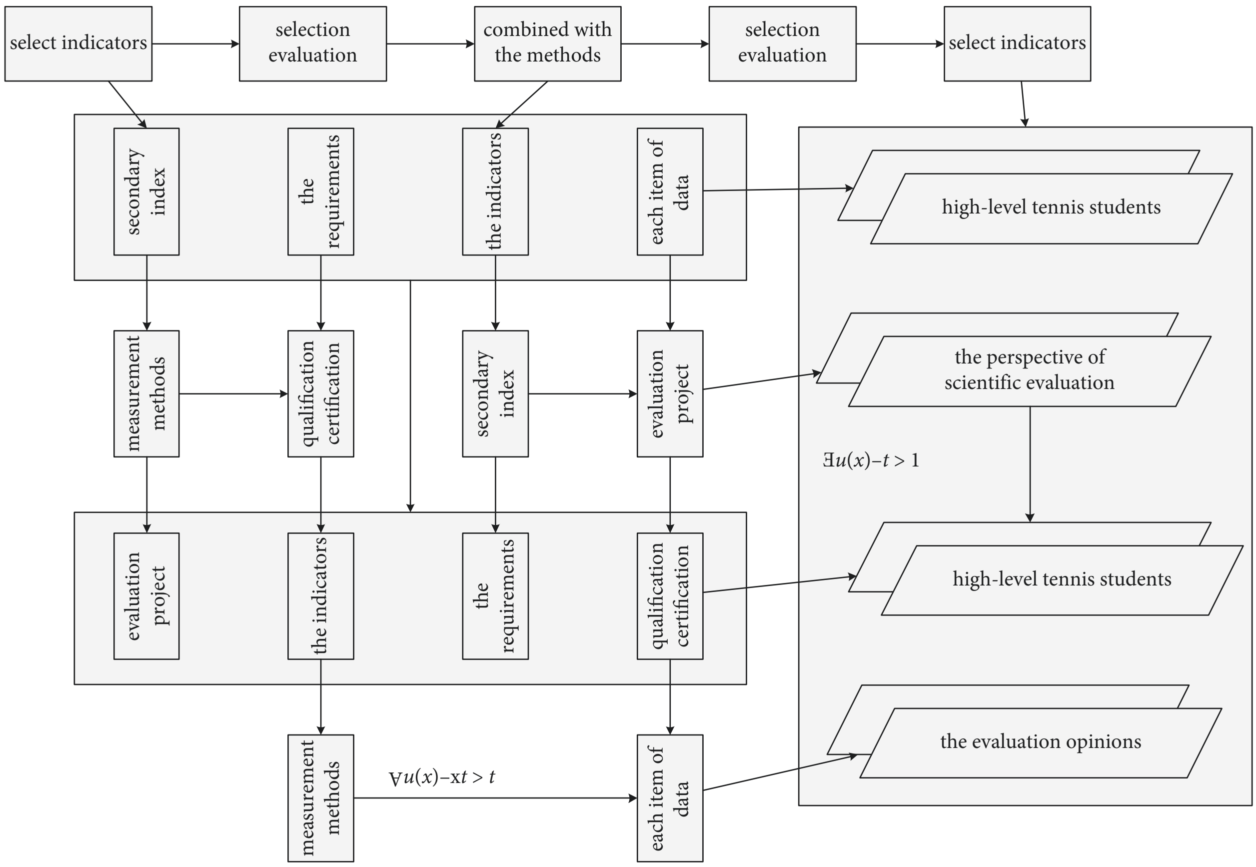

Figure 7: Evaluation topology of high-level tennis students.

course-related data, high-level tennis student-related data, student-related data, and system-related data, as student-related data collection, cleaning, and management.

$$\begin{aligned}\text{alpha}(x, y) = {} & \sqrt{\overline{1 - \overline{xy - x - \overrightarrow{y}}}} - \sqrt{\overline{1 - \overline{1 - x - \overrightarrow{y}}}} \\ & - \sqrt{\overline{1 - \overline{xy - \overrightarrow{x}}}} - \sqrt{\overline{1 - \overline{xy - \overrightarrow{y}}}} - 1.\end{aligned} \tag{12}$$

The standard regression coefficient is 0.483, and improving the technical level and competitive ability of this segment is the primary link to improve its competitive strength. The second is the scoring rate of the serving section, and the standard regression coefficient also reaches 0.450, which shows that the performance of the serving and the following shot also has a greater impact on the set point difference, while the standard regression coefficient of the stalemate segment with a higher score rate is only 0.036, and its impact on the disc score difference is relatively small.

In order to prove the role of the random matrix evaluation algorithm in the quality evaluation of college students, this paper selects several classic RF improved algorithms and the random matrix evaluation algorithm for horizontal comparison. The experimental data are all categories in the data set in Figure 8. CV $(X1) = 0.279$ is for service segment efficiency to CV $(X9) = 0.401$ and from CV $(X4) = 0.331$ to service segment efficiency CV $(X12) = 0.518$ has a relatively large change and is relatively unstable.

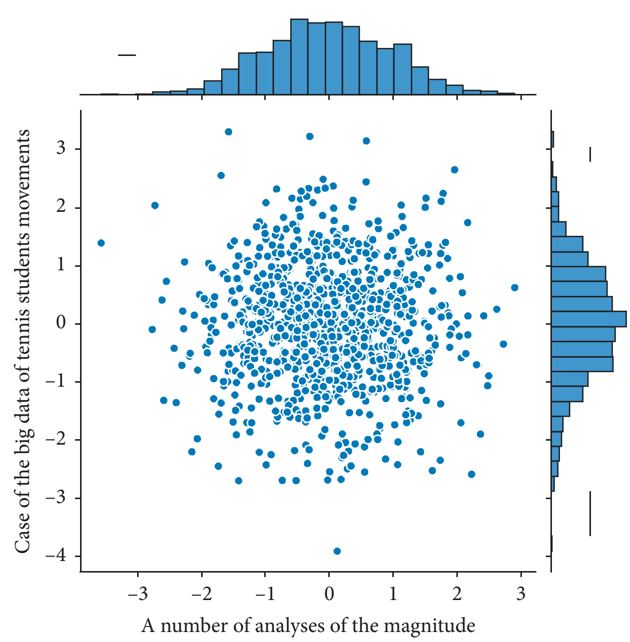

Figure 8: Amplitude analysis of tennis student sports big data.

$$\begin{cases} \langle \text{beta}(x) < 0 \quad | tx = 1, 2, 3, \ldots, n \rangle, \\ \langle \text{beta}(y) < 0 \quad | ty = 1, 2, 3, \ldots, n \rangle. \end{cases} \tag{13}$$

A Feature Interaction Module (FIB) is designed in the network to fuse and filter the features of the two task networks. A sparse convolution module is added to the screening process to improve generalization performance. A residual module of local features based on semantic contrast is added to the salient object detection branch of the network to simultaneously extract local and semantic information. The performance evaluation index is mainly the accuracy rate. The above four algorithms are implemented using the scikit-learn library on the PyCharm development platform using the Python language. The experiment uses tenfold cross-validation to analyze the sample set and evaluates the classification results based on the accuracy, recall, and $F1$ value.

4.3. Example Application and Analysis. This paper selects high-level tennis students in colleges and universities as the research objects, a total of 47 high-level tennis students. Each evaluation object has 12 ability indicators, forming a 47×12 matrix. We normalize the original matrix and then perform KMO and Bartlett tests on the normalized data. The test result is that the KMO value is 0.710, which is greater than 0.6; the Sig value of the Bartlett sphericity test is 0, which is less than the significant level of 0.05. This shows that there is a correlation between the indicators we provide, which meets the conditions of factor analysis. Factor analysis can be performed, and then the principal component analysis is further completed.

$$\frac{\sum u(x) - xt}{1 - \sum u(x) - xt} - \frac{\sum v(x) - xt}{1 - \sum v(x) - xt} - \frac{\sum w(x) - xt}{1 - \sum w(x) - xt} = \frac{1}{u(x)v(x)w(x)}. \quad (14)$$

There are two evaluation tables, which have been designed by predecessors and adjusted slightly according to this topic. The scores of these two tables account for a certain proportion in the learning attitude scores of tennis optional courses. Figure 9 uses Delphi proportion which is determined by the method of "self-assessment of a group of one teacher" and the attitude evaluation scale accounts for 8%.

SPSS 16.0 software is used for statistical processing of the statistical results of tennis singles video recordings, and the random phenomenon in tennis matches is studied based on probability theory. In each step of iterative training, only one of the primary and secondary networks is trained using the loss on one network and the loss of the fusion of the two networks. In this way, each training of one of the primary and secondary networks focuses on learning features that complement the results of the other network. And based on the special knowledge of tennis, it analyzes some rules that may exist in the relationship between some indicators and the score difference and provides guidance for players' training and competition techniques and tactics. From the statistics of the total points gained and lost, only the difference between the receiving and sending sections is negative, but the comparison between the scoring rate index data of each section and the standard regression coefficient $Y(X2) = 0.483$ can be seen: the most important technical factor affecting the competitive performance is not like the performance is relatively stable in the receiving section, but the competitive performance in the stalemate section of the serving. Improving the scoring rate at this stage can improve its competitive ability to a greater extent.

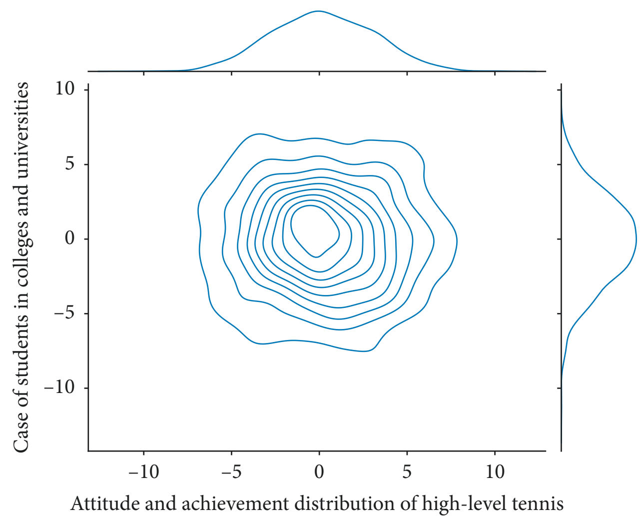

Figure 9: Distribution of attitude and achievement of high-level tennis students in colleges and universities.

$$\forall u(x) - xt < t, \exists u(x) - t > 1, t = 1, 2, 3, \ldots, i - 1, i. \quad (15)$$

In the current learning evaluation content of tennis optional courses in colleges and universities, basic skills account for 70% of the total score, theoretical knowledge accounts for 20% of the total score, and ordinary scores account for 10% of the total score. In the new learning evaluation system, tennis sports skills and tennis specific physical fitness account for 45% of the total score, tennis theoretical knowledge accounts for 10% of the total score, progress scores account for 15% of the total score, and evaluation of nonintellectual activities accounts for the total score. It can be seen that the new learning evaluation system reduces the proportion of tennis intellectual activities in the total score from 70% to 45%; it increases the proportion of nonintellectual activities in the total score from 10% to 30%.

$$\begin{cases} \dfrac{x}{(f(x) + x)\prime (f(x) - x)\prime < 1}, \\ P(f * x | f \in X, x \in X) > 1. \end{cases} \quad (16)$$

The current evaluation does not involve the progress evaluation, but the new evaluation system adds the progress evaluation, which accounts for 15% of the total score. This shows that the evaluation content of the new evaluation system is more comprehensive and the evaluation is closer to the actual situation of students. Matrix management mainly includes matrix paging display, assigning matrix roles, deleting matrix, adding matrix, and other functions. Sometimes the final decision tree structure will be very complex. At this time, the decision tree needs to be pruned to reduce

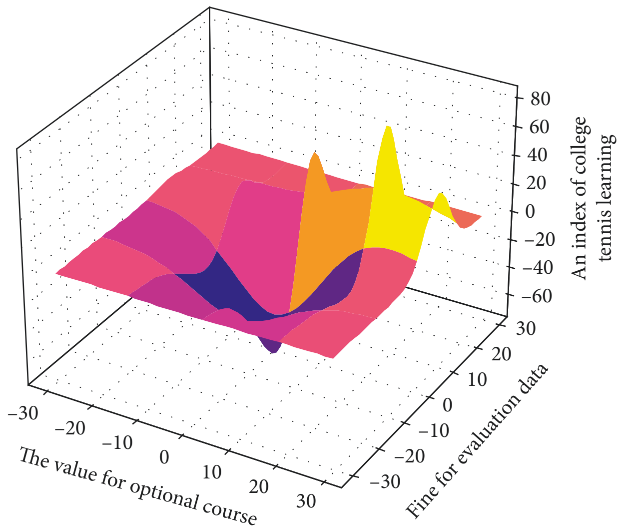

Figure 10: Fitting index distribution of learning evaluation of tennis optional courses in colleges and universities.

the complexity of the decision tree model and improve the accuracy of classification prediction by reducing the overfitting of the decision tree model; the delete matrix function can delete a selected matrix, which cannot be restored after deletion; the matrix function can set the matrix name and password of the new matrix, and the added matrix does not have any role.

After obtaining the distribution map of the evaluation index, we use the visualization toolbox in MATLAB to perform curve fitting on the discrete data in Figure 10, use the command to start the curve fitting toolbox in MATLAB, and use x data and Y data to read in the data, respectively, where X is a positive integer starting from 1, that is, the teacher number is sorted from small to large, and Y is the score calculated according to the evaluation system. Several fitting types are available in the toolbox, such as exponential approximation, smooth approximation, interpolation approximation, and Gaussian approximation to try different fit types to see how well they fit. Here first, the difference approximation is selected for curve fitting. In addition to the backup of the above improvement effect, we also consider finding a training mechanism that enables the main and auxiliary networks to learn more complementary features. Compared with the commonly used joint training mechanism, the iterative training mechanism we use does not have the mutual interference that may exist between two random matrix networks during simultaneous training. These 6 parts fully reflect the 5 areas of curriculum objectives, namely, sports participation, motor skills, physical health, mental health, and social adaptation, in the learning evaluation system.

After obtaining the specific evaluation scores, considering that the difference between the ability evaluation score and the comprehensive quality evaluation score is relatively large, this paper compares the gap between the ability evaluation model and the traditional comprehensive quality evaluation by student ranking and investigates the actual student evaluation and life. The results of the two aspects are compared in order to compare the pros and cons of the student ability evaluation model and the traditional comprehensive quality evaluation model and finally achieve the ranking of the comprehensive evaluation and evaluation model scores.

5. Conclusion

In the evaluation index of high-level tennis students' selection constructed in this paper, the second-level index points of high-level tennis performance are calculated by random matrix theory, and the weights of index points are calculated according to factor fitting. It emphasizes the whole-process evaluation of learning, emphasizing the evaluation of students' learning of different nature (combination of qualitative evaluation and quantitative evaluation), emphasizing the evaluation of different states of learning (that is, the combination of static evaluation and dynamic evaluation), and emphasizing the learning evaluation of full participation, to make a comprehensive evaluation of the learning of tennis optional courses in ordinary colleges and universities. It is scientific to use random matrix regression analysis to quantitatively analyze various indicators of the movement speed quality of tennis students. The research design conforms to the evaluation index system and evaluation standard scale of tennis students' movement speed quality and can be used for reference in combination with the actual situation. Using the UCI dataset as a training sample, generate an improved random forest model and analyze the time it takes to generate the improved random forest model and use the model to test the prediction dataset. The model improves the fairness and impartiality of each index, which can make the final evaluation result of the entire model tend to be fair and just and reduce the factors of human interference. In addition, because the random selection method is used to select the sample features, the influence of the sample data cannot be eliminated when dealing with unbalanced data. Therefore, the random matrix algorithm is improved when the evaluation model is established.

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 conflicts of interest or personal relationships that could have appeared to influence the work reported in this paper.

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