

## Research Article

# A Novel Data Mining Algorithm and Its Applications in Basketball Match Technique and Tactical Analysis

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The basketball game is a process in which players use different basic basketball methods to change their actions according to certain tactical structural forms. In the field of basketball, a huge data is generated during training, matches or competitions, sports management, and national physical fitness tests. During basketball matches, the management uses numerous methods to collect data about opponent teams, some of which are intuitive, while others may not be able to directly display their important information. In the sports domain, the coaches and managers use data mining techniques for transforming sports data into actionable knowledge and training their athletes for possible predictions of the outcomes of the games. This article focuses on the analysis application of data acquisition and preprocessing in basketball techniques, and tactical analysis is studied using the proposed data mining algorithm. The proposed algorithm and data of basketball games were used to make association rules analysis to analyze technical and tactical characteristics. The algorithm generates association rules based on the frequent item sets of basketball technical moves. It is evident from the experimental results that the proposed algorithm leads to high accuracy and better outcomes in terms of prediction.

## 1. Introduction

In the field of sports, a large amount of data and information will be generated in sports training, actual combat competitions, school sports management, and national physical fitness tests [1]. The final winning or losing of a basketball match is determined by the score, and the use of each player's basketball technique can also be seen from the scores of both players [2]. The principle of data mining is to analyze the initial data comprehensively and automatically and make inductive reasoning to dig out hidden information and rules, thus assisting decision-makers to make reasonable decisions [3]. In the process of basketball matches, coaches and basketball-related staff will use various means to collect the data of rival teams, some of which are intuitive, while some data may not directly show their important information, and even some data may show error information [4].

Basketball games are a process in which offensive and defensive changes are made by athletes using various basic basketball techniques and following a certain tactical

organizational form [5]. From the initial start-up period without clear competition rules, venues, and the number of people, basketball has experienced a period of perfect dissemination, a period of universal development, a period of comprehensive improvement, and a period of innovation [6]. In terms of resilience, basketball players have more than just technical responses. They need to constantly adjust their state and situation according to the changes in the playing field situation, reasonably adopt technology to respond to technical attacks from opponents promptly [7]. In basketball games, athletes demonstrate their resilience and skill level in the organization and game systems of competitive, open, random, and nonlinear competitive capabilities that are technical, tactical, or positional [8]. For a complex decision, good athletes should be able to encode game information more quickly and retrieve appropriate response actions [5]. The issue of sports decision-making is important in sports. Understanding sports decision-making will greatly improve the quality of sports training and the performance of sports competitions, which has very

practical significance [9]. How to effectively use the data and information in this basketball game and training to give full play to its potential value is precisely the problem that science and technology personnel in sports and related fields need to solve urgently [7]. Therefore, the introduction of data mining technology and other high-tech means to solve the large-scale data processing and reuse in the field of sports has become a consensus [10].

The accumulation of athletes' long-term training can only be recognized by society through the performance of exhaustion of competition, and the corresponding returns can be obtained [11]. As our country is in the transition stage from a planned economy to a market economy, the socialist market economy system has just been established. Basketball has special requirements for athletes due to its characteristics. The scientific selection of basketball players is of great significance [12]. Statistics and analysis of competition technical indicators have certain complexity, but analyzing the changing characteristics of data can also provide the basis for coaches to guide technical and tactical training and on-the-spot technical and tactical contingency [13]. Basketball is not only a skill sport but also a comprehensive sport with high requirements on physical ability. Judging the physical fitness in basketball depends on the athletes' strong and weak running ability [14]. Talent flow caused by talent competition is becoming more and more common in the sports industry. There is a lot of basketball statistical data. How to analyze the relatively messy and complicated statistical data in-depth and find out the change rules of these data to improve the combination of training and tactics before and after and improve the ability of competition is an urgent problem to be solved in basketball data analysis [15]. In this study, through the analysis and application of data collection and pretreatment of basketball technical movements, based on data mining methods, the correlation between basketball technical movements is studied.

## 2. Related Work

The method of data mining is not limited to the commercial application of scientific research, especially competitive sports. Usually, not only the athletes' level is high but also the coaches' tactics are very important, and sometimes tactics even play a decisive role. Wang used the data mining tools provided by the company to assist decision-making and replacement and achieved good results [16]. Data mining technology can analyze volleyball, football, and other similar antagonistic sports, find out opponents' weaknesses in the competition, and thus provide coaches with more effective strategies [17]. All the technical and tactical movements of basketball players are accompanied by complex thinking activities. Ma et al. believed that in a sense, the ability of basketball players to make decisions on the spot is the primary factor to win the game [18]. Liu et al. pointed out that basketball players' technical and tactical actions are accompanied by complex thinking processes [19]. It is an important research direction in basketball research to improve the speed and accuracy of basketball players' decision-making through the guidance of sports decision-making

training. Leung and Joseph [20] conducted a study on sports data mining while predicting results for college football games and concluded that the predictions based on the proposed approach show relatively better results with high accuracy.

## 3. Application of Data Acquisition and Preprocessing in Basketball Technique

The basic skills of basketball are the basis of basketball. The application of any skills and the coordination of tactics require athletes to have certain basic skills and tactical awareness. Only in this way can it be applied in actual combat. Sociologically speaking, human behavior similarity sometimes depends on the results of specific cultural backgrounds. Compared with long-term and low-intensity sports, basketball is more closely related to the anaerobic energy supply system. The way athletes deal with confrontation and cooperation in different cultural environments must also have obvious differences [21]. The characteristics of the diversified development of world competitive basketball schools also illustrate this fact [22]. In basketball, sports decision-making is a very complicated process. Currently, it is still in a perfect stage in theory. In the process of forming a complete system, it needs constant exploration and practice. The core performance of athletes' special physical fitness lies in the combination of sprint and high-speed running strength with the running ability of the ball, which has a very important impact on the results of basketball matches. In order to thoroughly solve the special ability of repeated running required in basketball matches, it must be solved based on aerobic metabolism and combined with the running and changing ways of the ball.

Fifty male basketball players were selected as subjects. The exercise period is more than 5 years, the exercise grade is grade 2, and there is no history of lower limb joint injury. All subjects are skilled in squat lifting and weight-bearing squat jumping movements and have a good muscle strength foundation. There are no history of heart disease or neuromuscular disease and no disease of lower limbs. The basic characteristics of the subjects are shown in Table 1.

High-level basketball players have significant accuracy and speed in sports decision-making, and the positive correlation trend in sports level also reflects the relationship between the level of sports and the speed and accuracy of sports decision-making. As a discipline, data mining aims to solve problems in various industries. The solution process requires different technologies and practices in different research fields [23]. The playing time of basketball players in the match is the key to determining their running distance and also has an important relationship with the exertion of personal skills and physical fitness. Basketball players should not only take an active part in the attack but also return to the backcourt in time to take part in the defense. This high frequency and fast rhythm are the characteristics of basketball [24]. Both athletes and coaches attach great importance to mistakes and regard them as an important indicator to evaluate the performance of athletes in competitions.

TABLE 1: Basic characteristics of the subjects.

| Features  | Age      | Height (cm) | Weight (kg) |
|-----------|----------|-------------|-------------|
| Numerical | 22 ± 2.2 | 186 ± 3.1   | 80.9 ± 4.5  |

Training is a continuous and gradual process. If you do not get a good recovery after overload exercise, the microdamage of the body will accumulate and eventually lead to sports fatigue and sports injury. For example, Table 2 is the statistics on the causes of sports injuries of basketball center players. It can be seen that sports injuries caused by injury training are the first, accounting for 42%. Secondly, the local burden is too heavy, accounting for 22%.

The athlete’s technical level can be judged from the rationality and stability of the technology. Every decision made by athletes in the competition must use the knowledge stored in their minds. The form of knowledge stored in their minds is called a psychological representation of knowledge. The direction, rhythm, angle, and position of technical movements are closely related to the movement speed [25]. Only by mastering correct and reasonable techniques, being good at completing movements easily and coordinately, and having no extra muscle tension, can we give full play to the existing fast level. It is very difficult for athletes to fully grasp all the details of the field when they carry out activities under rapidly changing conditions. Every decision made by athletes in the competition must use the knowledge stored in their minds. The form of knowledge stored in their minds or presented in their minds is called a psychological representation of knowledge [26]. Whether it is a cognitive decision or an intuitive decision, the biggest goal pursued is to achieve as high a hit rate as possible in a limited time. According to the different conditions faced by the decision-making task, the decision-making types adopted are different in different sports situations. Highly developed coordination ability is an important prerequisite for athletes to master reasonable sports skills.

After classifying and symbolizing the data, the data table of basketball game affairs is obtained, as shown in Table 3. The related information field of the table records the technical actions and related information of the competition.  $D = \{A, B, C, D, E, F, G, H, I\}$ , where A stands for technical action assists, B stands for 2-point ball score, C stands for a rebound, D stands for a steal, E stands for 3-point ball score, F stands for a free throw, G stands for a breakthrough, H stands for pick-and-roll, and I stands for the block.  $S = \{S1, S2, S3, S4, S5, S6, S7, S8\}$ .

The data mining process in athlete data analysis and management is shown in Figure 1.

In essence, tactics are the coherence of technology in time and its displacement in space. Athletes can flexibly apply foul techniques according to different penalty scales of different referees on the court, thus achieving the goal of defense. For the whole match, there are higher requirements for the three power supply systems. If you encounter athletes with a higher level than yourself in the competition, you must adopt active attack and snatch tactics to make up for

TABLE 2: Statistics of causes of sports injuries for basketball players.

| Cause of injury                   | Number |
|-----------------------------------|--------|
| Inadequate preparatory activities | 6      |
| Technical action is not standard  | 4      |
| Poor self-protection ability      | 4      |
| Injury training                   | 21     |
| Poor mental state                 | 2      |
| Local overload                    | 11     |
| Poor resistance                   | 2      |

TABLE 3: Data table of basketball game affairs.

| TID | Technical actions that occur |
|-----|------------------------------|
| S1  | A, B, G, H                   |
| S2  | A, B, C                      |
| S3  | A, B, D, F                   |
| S4  | C, G, H                      |
| S5  | A, B, C, G                   |
| S6  | D, D, H                      |
| S7  | B, E, F                      |
| S8  | B, C, F, I                   |

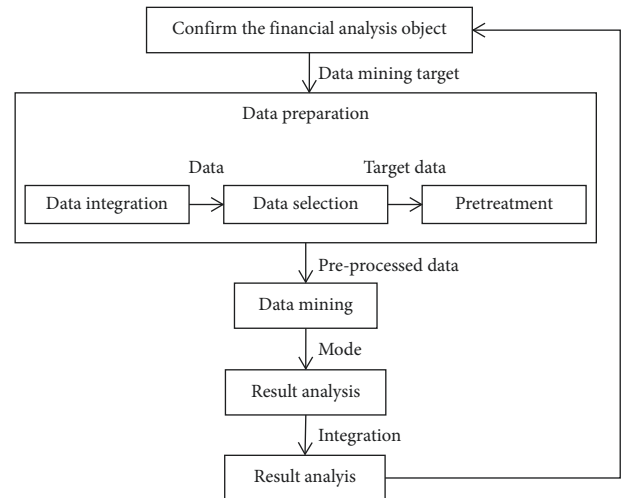


FIGURE 1: Data mining process in athlete data analysis and management.

the technical or experience deficiencies. Figure 2 is a plastic structure of the motor function.

Reasonable arrangements for the content of the preparatory activities, the general preparatory activities, and special preparatory activities will be reasonable convergence. The preparation activities are similar to the requirements of basketball special technical movements, thus preventing the occurrence of sports accidents in basketball special training. The structure of the basketball special sports training system is shown in Figure 3.

During the optimization modeling process of basketball players’ overtraining on joint injuries, the vector set of basketball players’ overtraining on joint injuries is established. Assume that  $W$  represents the variance vector of the

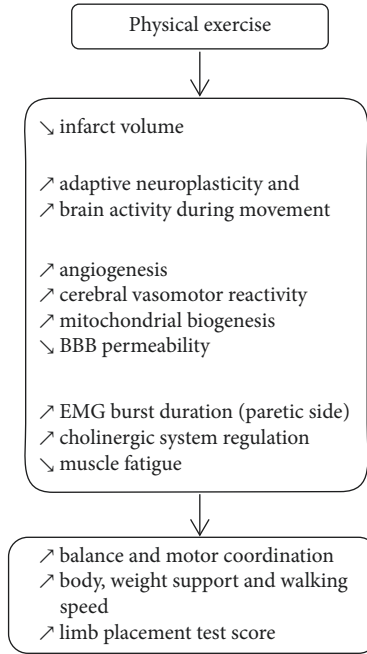


FIGURE 2: Plasticity structure of motor function.

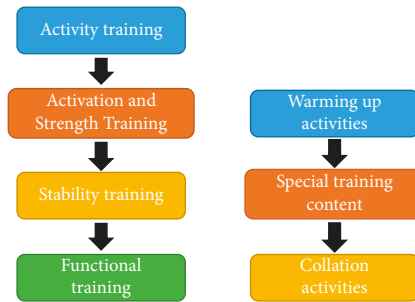


FIGURE 3: Basketball special sports training architecture.

joint injury vector set caused by overtraining of basketball players. The following formula can be obtained:

$$w(x, y, d) = \exp\left(-\left(\frac{d_g}{r_g} + \frac{d_c}{r_c}\right)\right). \quad (1)$$

During the optimization modeling process of basketball players' overtraining on joint injuries, the following formula can be obtained according to the above formula:

$$V(x) = \sup_b \{V(x, b)\}. \quad (2)$$

In the optimization modeling process of basketball players' overtraining on joint injuries,  $E$  represents the orthogonal transformation matrix of basketball players' overtraining on joint injuries. The transform code gain of  $E$  is defined by the following formula:

$$\ln k = -\frac{E_a}{RT} + B. \quad (3)$$

During the optimization modeling process of basketball players' overtraining on joint injuries, the following formula can be obtained:

$$k = A \exp\left(-\frac{E_a}{RT}\right). \quad (4)$$

After treadmill training and electromagnetic field intervention of joint injury, two conventional indexes were detected to reflect metabolic changes during joint injury repair. As shown in Figure 4, the values of total ALP and platelets in serum have not changed significantly.

Apart from the technical foundation, the athletes' intelligence and general and professional knowledge level have an important influence on the development and improvement of their tactical ability. Data mining is a technique to find the rules from a large number of data by analyzing each data. After obtaining the competition data, how to do a good job of data mining determines whether the appropriate rules can be found. The competitive level can improve or reduce the strength of competitive motivation through different attribution, thus affecting the improvement of competitive ability [27]. Training methods and methods closely linked with physical fitness and special sports can be adopted to improve the special sports quality of basketball. In order to adapt body shape to the requirements of basketball competition, physical quality training should focus on some aspects on the basis of all-around development. Tactical ability is expressed by striving to exert one's physical, technical, and psychological abilities excellently [28]. Basketball matches require repeated extreme sports of short duration and high intensity. Data mining combines various disciplines and technologies, adopts various data editing methods and tools, and can design different combinations to express things according to the characteristics and performance of analysis objects.

#### 4. Application of Data Mining in Technical and Tactical Analysis of Basketball Match

The focus of the research is not basketball data collection; of course, the quantity and quality of basketball data collection samples are also important influencing factors of data mining results. Basketball matches are conducted in high-speed offensive and defensive transitions, and it is normal for athletes to make some unconscious movements. To participate in the competition successfully, it is necessary to motivate the contestants by active means, effectively mobilize the athletes' physiological and psychological systems, and actively participate in the data mining of competitive activities [29]. It is a new information technology with actual effect and strong vitality. Its application in the field of sports has been extended to some extent, but there are also some problems in practical application. Human's spiritual motivation and social adaptability are actually the unity of the content and form of human's competitive ability. Spiritual motivation is the essential content of human's competitive ability [30]. Competitive talent is an extremely complex combination of individual characteristics, among which the maturity and performance of multiple characteristics are not the same. In the process of information processing, basketball players make professional predictions of important suggestive information, make empirical summaries of

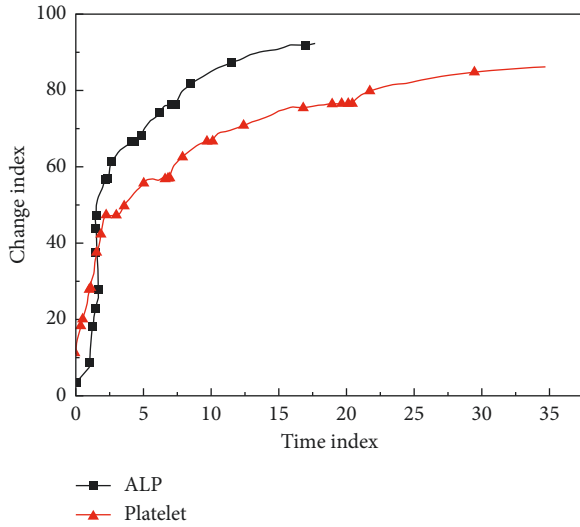


FIGURE 4: ALP and platelet data in serum.

changeable sports scenes, and master the distinguishing features under different information scenes. If athletes choose the right information and process it effectively, the decision-making effect will be good.

The sports injuries of basketball players are mainly concentrated in the ankle joint, waist, knuckle, and knee joint. Of the 50 basketball players surveyed, 14 suffered ankle injuries, accounting for the highest proportion. Seven people were injured in the waist. Nine people suffered knuckles injuries. The number of knee joint injuries was 8. These parts with a high incidence of sports injuries are all related to the sports technical characteristics of center players. Table 4, for example, is statistical data on the vocal parts of basketball players with sports injuries.

At present, the analysis of basketball techniques and tactics is mainly based on the information collection points and intensity of basketball matches. The standardization of basketball script language affects the actual effect of ball game techniques and tactics analysis. According to the viewpoint of information theory, in the process of athletes processing information, the disorder of information processing increases with the increase in information content, thus making the information processing process more complicated and the decision-making more difficult [25]. In the multicomponent physical training, there was no excessive fatigue and sports injury in the body of the experimental subjects, which indicated that the exercise load and intensity of physical training were reasonable [29]. If athletes choose the right information and process it effectively, the decision-making effect will be good. The integrity of data and the support of professionals will all affect the process of data mining. In the current basketball match, the fast attack is the outstanding representative whose decision-making ability fully shows the advantages. The number of fast attacks and the success rate is often the key to the victory or defeat of the match [31]. With the increase in difficulty in scene pictures, the accuracy of decision-making of middle-level basketball

TABLE 4: Statistics of vocal parts of sports injuries of basketball players.

| Damage site    | Number of injuries |
|----------------|--------------------|
| Head           | 3                  |
| Shoulder joint | 2                  |
| Upper arm      | 2                  |
| Forearm        | 2                  |
| Waist          | 7                  |
| Wrist          | 2                  |
| Elbow joint    | 3                  |
| Knee           | 8                  |
| Ankle          | 14                 |
| Digital joints | 9                  |

players and elementary-level basketball players decreased significantly, while that of high-level basketball players did not change significantly [32]. In intuitive decision-making, the competition situation provides limited clues and time is relatively tight, so there is no more time to search for other clues.

The changes of knee joint three-dimensional motion angle and muscle force in each analysis step are applied to the finite element model as boundary conditions. Sometimes when the human body takes part in sports activities, the function of its own moving organs does not reach the state of fatigue, but the decrease in the functional efficiency of the brain cells causes the continuous decrease in the working efficiency of the whole human body. Virtual surgery is to cut and reassemble different parts of human bones. To achieve this function, another very important interaction is the selection of components by mouse. The motion angle parameters applied to the finite element model are shown in Table 5 and Figure 5. The relationship between rotation angle parameters and time under the condition of healthy side and affected side is shown in Table 6 and Figure 6.

During the swing phase of the acceleration phase, no ground reaction force acts on the lower limbs. Therefore, the lower limb joint has no contact moment component. In the hip joint, inertia moment and muscle moment are the main ones. The rapid elongation of extensor muscles of lower limb joints of athletes is passive. In order to obtain the maximum centripetal contraction force, it is very important to make full use of the elastic deformation energy of muscles. The change of braking force and propulsion force with time is shown in Figure 7.

Based on the relationship between overtraining of basketball players and factors affecting joint injuries, the sample matrix of joint injuries caused by overtraining of basketball players is obtained:

$$X_i = (X_{i1}, X_{i2}, X_{i3}, \dots, X_{id})^T, \quad (5)$$

$$X_{id} \in (X_{\min}, X_{\max}).$$

Use the following formula to express the correlation matrix of joint injury samples caused by overtraining of basketball players:

TABLE 5: Parameters of the motion angle applied to the finite element model.

| Analysis step | Buckling angle | Angle of adduction | Internal rotation angle |
|---------------|----------------|--------------------|-------------------------|
| 1             | 17.92          | 9.54               | 11.42                   |
| 2             | 16.36          | 8.34               | 10.44                   |
| 3             | 12.76          | 8.61               | 11.78                   |

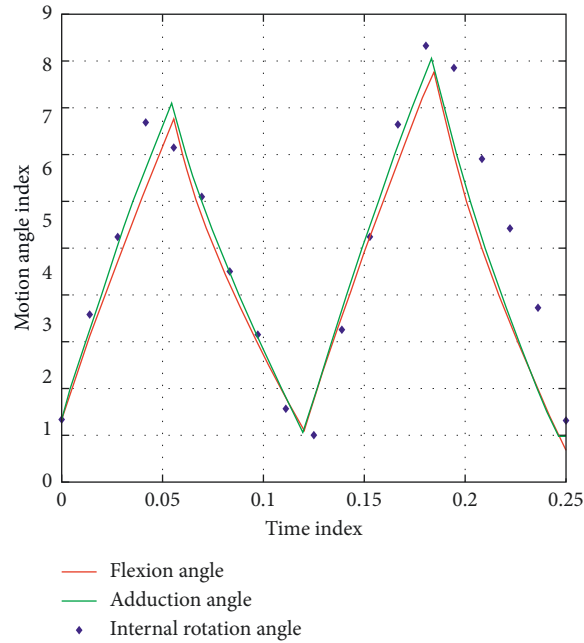


FIGURE 5: Motion angle data applied to the finite element model.

TABLE 6: Rotation angle parameters under active and passive conditions.

| Rotation angle parameter        | Healthy side | Affected side |
|---------------------------------|--------------|---------------|
| Maximum internal rotation angle | 2.59         | 3.12          |
| Maximum external rotation angle | 4.31         | 3.64          |
| Rotation angle range            | 8.95         | 9.27          |

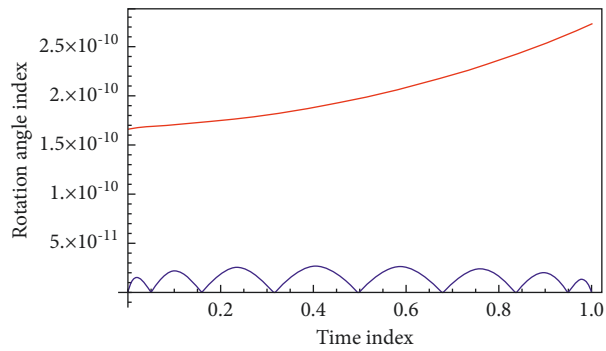


FIGURE 6: Relationship between rotation angle parameters and time.

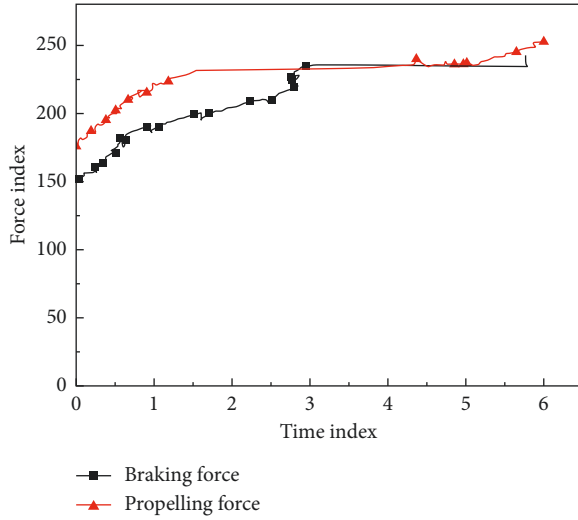


FIGURE 7: Braking force and propulsion change with time.

$$D_i = a + \sum_{j=1}^n b_j \ln(p_j) + r_i \ln(Y) + u, \quad (6)$$

$$D_i = a + \sum_{j=1}^n b_j p_j + r_i Y + u.$$

According to the following formula, a basketball player's joint injury model caused by overtraining is established:

$$V_{id} = wV_{id} + c_1 r_1 (P_{id} - X_{id}) + c_2 r_2 (P_{gd} - X_{gd}). \quad (7)$$

When athletes take off, they will be subject to the reaction force of horizontal and vertical grounds on their left foot. The vertical and horizontal component curves generated by the left pedal are also very complicated. In all athletes, the horizontal component points to the side, thus slowing down the forward movement of the athletes. The left foot hindered the forward movement. However, at the same time, it is beneficial for the horizontal component curve to be high and steep, and the force drop is small in the buffer phase. Therefore, it is difficult to brake and support the left leg. We selected three athletes to test the stress on their feet. The force curves are shown in Figures 8 and 9.

Only the correct action mode will produce the correct action technology. Conversely, correct movement techniques will help athletes learn the correct movement patterns. The test results of each mechanical index before and after training are counted, and the experimental results are shown in Figure 10.

For training practice, the difference between the maximum isometric force and the maximum centrifugal force measurement results can make a preliminary evaluation of the autonomic excitement ability of the corresponding muscles mobilized during the test. In the ankle, there is only one peak of muscle torque during the support phase. The ankle plantarflexion moment in the acceleration phase is smaller than that in the maximum speed phase. A comparison of flexion moments in different joints at different time periods is shown in Figure 11.

In basketball matches, the original data of the match are edited through data mining technology, which is helpful for coaches to understand the athletes' special skills and short boards and to reasonably match the combination of players on the field. It is also helpful to summarize and predict the technical strategies in future matches. According to the needs of competitive competition, functional training in the field of competition emphasizes improving athletes' competitive ability, and its role in the field of rehabilitation still protects competitive training [33]. In the process of static strength training, athletes need to keep their shoulders, hips, knees, and ankles in a line at all times. At the same time, the abdomen and hips need to be tightened. Only by maintaining this posture can athletes use their whole body muscles to make concerted efforts to better improve their nerve excitability [34]. Data mining technology can screen useful tournament information in a large amount of data so that fans can easily understand the team's tactics and combinations through edited data, which is more conducive to discussion and analysis. The results of basketball matches are uncertain, and the usual influences include subjective and objective factors [35]. These factors, such as the weather at that time, the altitude of the venue, climate, and so on, may also be due to the athlete's character, mood, interpersonal relationship, and so on. Athletes are easy to develop dependence on the team and lack the ability to deal with problems independently.

Combining statistical analysis theory to extract the relationship between basketball players' overtraining and sports injury factors, the following expression can be used:

$$C(x, y, d^{(i)}) = \sum_{(x,y) \in N(x,y)} w(x, y, d^{(i)}) \cdot \text{SelfAd}(x, y, d^{(i)}), \quad (8)$$

$$\mu_B(T, p) = \mu_B^*(T, p) + RT \ln x_B.$$

Use the following formula to express the second-order moment of basketball players' overtraining sports injuries:

$$\frac{\Pi}{c} = \frac{RT}{M_n} + A_2 c. \quad (9)$$

Establish a linear transformation matrix that produces sports injury factors for athletes:

$$\text{HWt} = \frac{\sum_{i=1}^n D_i(x)}{N}. \quad (10)$$

When basketball players do jumping, the time of landing phase and the time ratio of pedaling and stretching phase to buffer phase can reflect the sports nature and working ability of the players to some extent. The ankle angle and time data in the support stage before and after training are shown in Figure 12.

Sports biomechanics will enable basketball coaches to better understand the rules and principles of biological sports, the interactions that affect biological sports, and the state of stress on joints during human movements. Calculate the output of each neuron in the hidden layer:

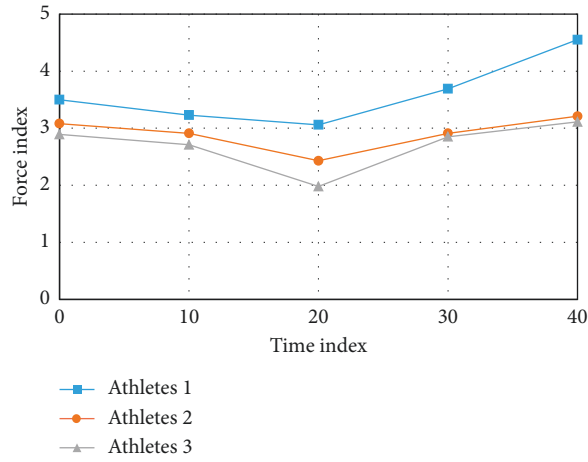


FIGURE 8: Athlete's horizontal force curve.

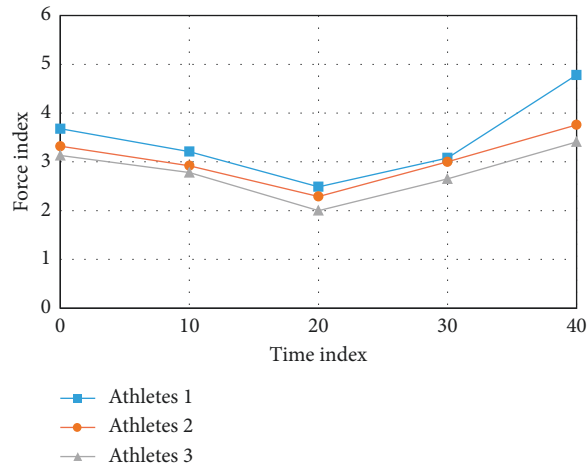


FIGURE 9: Athlete's vertical force curve.

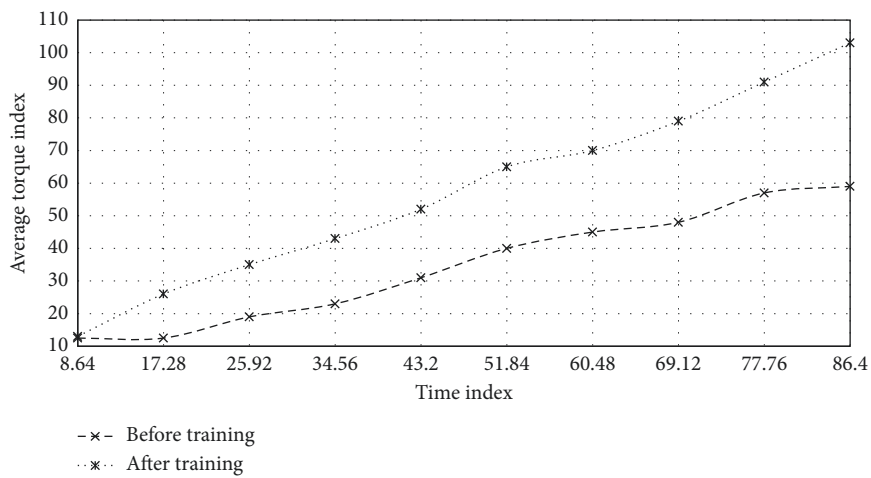


FIGURE 10: Comparison of average muscle strength in each period of knee extension before and after training.



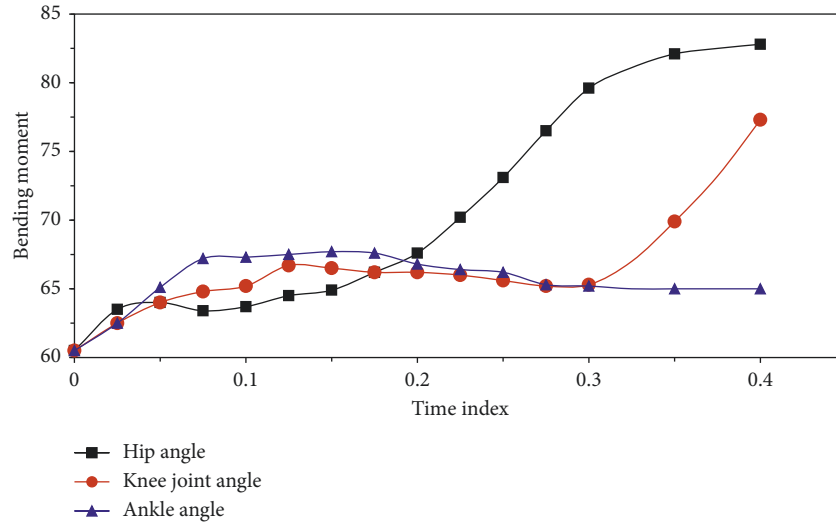


FIGURE 11: Comparison of flexion moments in different joints at different time periods.

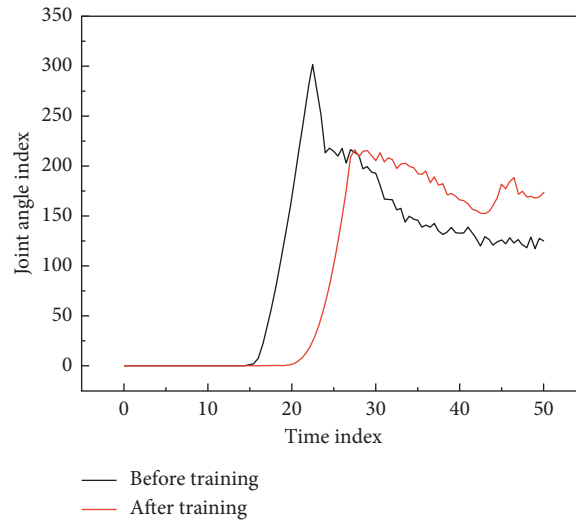


FIGURE 12: Ankle joint angle and time data before and after training.

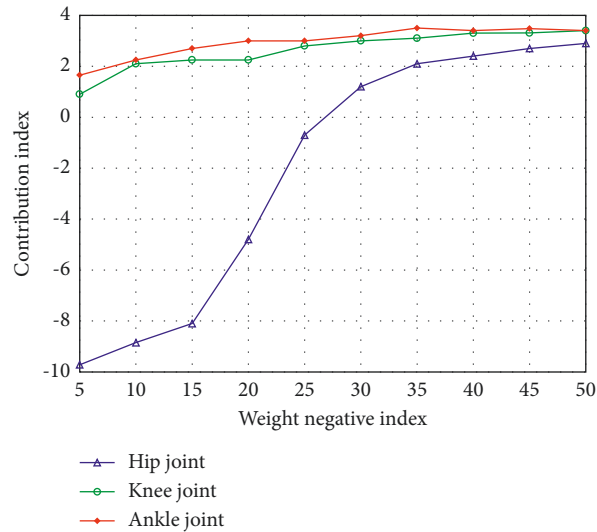


FIGURE 13: Contribution and load data of three joints.

$$w = (w_{\max} - w_{\min}) \times \frac{I_{\max} - I_i}{I_{\max}} + w_{\min}. \quad (11)$$

Calculate the error of the output layer neurons using the given output data:

$$f_1(x) = \sum_{i=1}^{D-1} \left[ 100(x_{i+1} - x_i^2)^2 + (x_i - 1)^2 \right]. \quad (12)$$

The statistical results show that the contribution of each joint to lower limb work increases with the increase in external load: the contribution of the hip joint gradually increases while that of the knee joint gradually decreases. There was no significant difference in ankle joint contribution under various weight-bearing conditions. There is no linear relationship between the contribution of the three joints and the load, and the contribution does not increase or decrease linearly with the increase in the load as shown in Figure 13.

The traditional recognition and division of competitive ability pay attention to the ability of human's natural attribute and social attribute but do not pay enough attention to the role of irrational factors in human's spiritual attribute in human's system. There is no significant difference in fixation frequency between basketball players of different levels, while basketball players of the same level have a significant difference in fixation frequency in different difficult scenes. On the field, team members often make collective mistakes like catching infectious diseases [36]. Only when people have the spiritual ability can they create and form social ties and show their social adaptability. Data mining can find out the information of recent airport matches, analyze much real information in basketball matches in various ways, and then quickly mine and edit the information. Based on the obtained information, players can be evaluated so as to maximize the combination of players and break the attack combination chain of enemy players [37]. Each basketball team will include the main team and several backup teams. Generally speaking, if there are no major emergencies such as injuries, the main team will remain stable [38]. Data mining can deeply decompose the relationship between players' performance or training status and training standards. Reasonable use of the potential experience rules and prediction rules in this information can make athletes have targeted training, reduce unnecessary time waste, provide a factual basis for the training plan of far mobilization, and further continuously improve competitiveness.

## 5. Conclusion

In the era of digitalization, the processing and editing ability of information in basketball matches and the transformation of data results can not only optimize the control of the basketball information base but also determine the promotion level of future basketball matches. The results of basketball matches are uncertain, and the usual influences include subjective and objective factors. With the continuous development of data mining technology and the

continuous in-depth research of sports science and technology personnel, both the theoretical research of data mining in sports and the research and development of practical data mining tools can bring great convenience and considerable benefits to sports management decision-making and scientific research. Data mining technology can screen useful tournament information in a large amount of data so that fans can easily understand the team's tactics and combinations through edited data, which is more conducive to discussion and analysis. Reasonable use of the potential experience rules and prediction rules in the data information can make athletes have targeted training, reduce unnecessary time waste, provide a factual basis for the training plan of far mobilization, and further continuously improve competitiveness. In reality, there are still many data types and data amounts in the competition database. How to use this algorithm to correct a large amount of data and finally obtain a model with high reliability and low risk and cost is the main direction of our future research.

## Data Availability

The data used to support the findings of this study are included within the article.

## Conflicts of Interest

The author declares that there are no conflicts of interest.

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