Stress Sensitivity of Loose Sandstone and Sports Training Management Based on Image Recognition

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Abstract
This paper studies the stress sensitivity and training management of loose sandstone based on image recognition in detail. Loose sandstone is one of the most common storage rocks, which accounts for a large proportion at home and abroad. In the process of developing loose sandstone reservoir, it is basic to obtain the mechanical parameters correctly. Because of the high porosity, high permeability and weak separation strength of loose sandstone, the paper discusses the influence of gap water pressure, and temperature on mechanical parameters of loose sandstone. The compressive strength of loose sandstone decreases with the increase of the gap water pressure. The elastic modulus of loose sandstone will decrease greatly under low clearance water pressure, but it is slow to decrease under high clearance water pressure, and Poisson ratio will decrease first and then increase. But the accuracy of quadratic fitting of compression strength, elastic modulus, and clearance water pressure is high, but the accuracy of Poisson ratio is low and the correlation is weak, which shows that there is no accurate correlation between Poisson ratio and clearance water pressure. With the increase of temperature, the compressive strength, and elastic modulus of loose sandstone begin to decrease, then rise, and then decrease rapidly after reaching the critical temperature. This is not good for the stability of the rock. Based on the above research, the general university physical education outside the curriculum is finally fully understood, which provides the basis for the decision-making and proposal of relevant departments. This paper uses literature, questionnaire, interview, mathematics statistics, logical analysis, and other methods to take 93 universities as the subjects of investigation. This paper investigates the status of university administration, coaches, athletes, and stadiums, and then uses SPSS12.0 system and Excel software to make statistics and processing of data, so as to provide strategies for sports training management.

Keywords Image recognition · Loose sandstone · Stress sensitivity · Sports training management

Introduction
An image is a collection of graphics and images, and is an information carrier with rich content that humans can access. In the image recognition process, humans generally recognize the image by judging the characteristics of the image. For computers, the process of image recognition is similar to that of humans. In order to judge and recognize, it is necessary to find, process, and extract features. Image recognition technology is the direction of artificial intelligence research, and the characteristics of images are the prerequisite for using image recognition technology (Ansari et al. 1994). After years of research, human image recognition technology has been investigated in more detail, and many practical and important results have been collected (Asheim 1986). The application of image recognition technology is becoming more and more widespread (Fan et al. 2018). Currently, loose sandstone reservoirs account for most of China’s proven oil and natural gas reserves. If we can make better use of these new technologies for development, it will make a great contribution to China’s energy strategy (Fan et al. 2019). Loose sandstone has different characteristics from other tight rocks. It has the
characteristics of large crevices, high permeability, and small condensation strength. Therefore, in the actual drilling operation, even after the formation pressure is successfully released, the probability of success will reduce the drop in interstitial water pressure (Fathizad et al. 2017). And in this process, the coagulation strength is higher than that of ordinary rock, and its physical parameters are very different (Frank et al. 2016). Therefore, the mechanical property data obtained by the triaxial rock mechanics test method in the previous laboratory is quite different from the actual situation. Therefore, if the physical parameters of the formation can be greatly reduced, the accuracy of the test results can be greatly improved (Gueymard and Ruiz-Arias 2015). Loose sandstone storage layers are widely distributed in almost all continents in the world, such as the United States, Canada, Indonesia, Venezuela, and other places (Hargreaves and Samani 1982). In China, it is mainly concentrated in the Sichuan oil field, while other oil fields are scattered in the Bohai Bay and Liaohe oil fields. In the after-school training, the coach guides students who have a strong interest in sports, helps them to form relevant sports training groups, carry out relevant sports competitions, and build sports teams to continuously improve students' comprehensive quality level and develop in the case of students' special strengths, they can also maximize their interest in learning and cultivate sports talents for the country. Based on this, actively organizing and developing after-school training is very important for the implementation of education and physical education in China (Hargreaves et al. 1985). In order to fully realize the policy of national participation in sports, achieve the goal of school physical education, and promote the popularization and improvement of sports, after-school training is an indispensable link in school physical education (Hassan et al. 2016). The smooth development of after-school training can promote the development of school sports and allow more students to participate in sports activities (Hassan et al. 2017). For students after school, more activities are provided to learn physical fitness methods to form lifelong good sports habits and lay a solid foundation for the later development of life (Hassan 2009). At the same time, it can also improve the reputation of the student's physical education teacher and increase the popularity of the school (Hunt et al. 1996).

Materials and methods

Rock sample preparation

In this test, the coring was collected from the outcrop of the oil field block. The standard sample used in the test is a cylinder with a diameter of 25 mm and a height of 50 mm (Ihaddadene et al. 2019). The allowable error of the diameter of the prepared rock sample is less than 0.2 mm, and the nonparallelism of the two end faces of the rock cylinder must be less than 0.02 mm. The end face of the rock sample cylinder and its axis are at a right angle of 90°, and the allowable error value shall not exceed 0.001 arc. The axial direction of all rock samples is the same as that of the core and the allowable error is less than 0.25°. In order to ensure the accuracy and reproducibility of the experiment, CT scanning was used to detect no hidden cracks in the prepared rock samples and cracks generated during the preparation process for coring (Jamil and Akhtar 2017). In order to shorten the waiting time in the test process, the core can be immersed in distilled water for more than 35 days before the test to confirm that the core is fully saturated (Kashyap et al. 2017).

The material composition of the rock, the internal structure of the rock, and the environment, etc., various factors affecting the physical and mechanical properties of the rock, especially the sedimentary rock on the soil surface is a representative of this type (Khatib et al. 2012). Because of their different production and environment, magmatic rocks, metamorphic rocks, and other rocks are very different. Because rocks with high porosity have relatively small strength, large deformation changes, and complex composition, the mechanical properties of rocks with high porosity are different from those of other rocks (Li et al. 2010). The main factors that affect the elastic modulus of the rock in the formation are: the mineral composition of the rock, the porosity inside the rock, the pressure, temperature, and pore structure inside the rock (Liu et al. 2009). Therefore, the elastic modulus of rock may be a multivariate function. It is composed of parameters such as porosity, cement content, temperature, and pressure (Loghmari et al. 2018). There are many theoretical models to calculate the elastic modulus of rocks (Maluta et al. 2014). Generally, there are three methods: direct measurement method, theoretical calculation method, and experimental method (Meenal and Selvakumar 2018). Each method has advantages and limitations. Physical measurement is a method that combines all the parameters of the rock, including elastic modulus, porosity, temperature, and pressure of the formation environment.

Design of image recognition algorithm

As an important factor in target recognition, researchers in machine vision and other related fields pay great attention to shape features. The research on shape features mainly focuses on the features of contour and region. The boundary is easy to distinguish the target and the surrounding environment, so the contour feature is related to the boundary. The obtained image will be affected by many factors, such as the intensity of the light, the position between the shooting tool and the target, but these factors will affect the brightness of the captured image, the proportional relationship between each part, and so on. There is almost no effect on the overall outline of the target.
Therefore, in the case of performing simple shape recognition, contour features are preferred (Meza and Varas 2000). In order to distinguish between the consistent image and the background, the feature of the area is extracted from the viewpoint of the entire area.

As a widespread existence, there is no correct definition of point. Given a specific scope in a narrow sense, there will be characteristics related to the real meaning (Mohammadi and Aghashariatmadari 2020). Broadly speaking, it is the position of abstraction. If you want to start image recognition from the boundary, you can verify the relevant elements from the required aspects. For example, the gray value, as a group of boundary point elements, the gray value of adjacent elements will vary greatly. The pixel operators used to determine such significant grayscale changes include predefined operators and log operators. This operator determines the boundary point based on a predefined threshold.

As the concept of vector calculation, in target recognition, the gradient value and gradient direction of a specific point are often used. Predefined operators are used as the basis of calculations, and the corresponding calculation expressions are as follows:

\[ G = \frac{(|H| + |V|)}{2} \]  
\[ \theta = \tan^{-1} \left( \frac{V}{H} \right) + \pi \left( \frac{3}{2} \right) \]  

The gradient value calculated in the formula (1) is used as a criterion for judging the boundary point. If the value is 0, it is discarded directly. If it is not 0, compare with the preset threshold. If the comparison result shows that the difference between the two is greater than 0, it is put into the boundary point set.

In human object recognition, the internal area of contour information is relatively intangible and needs to focus on contours. This is mainly the result of people who pass the external contours, and the object recognition of objects can be determined based on prior knowledge. If the contour information contains less internal area, the time can be shortened by recognizing the contours. However, contour features are local features and are easily affected by noise and deformation.

**Effective stress principle of loose sandstone**

By analyzing the force of the rock disk, no matter how complicated the type and direction of the force of the rock disk, it can be simply divided into internal force and external force: vertical overload pressure, horizontal pressure, and other external forces. The pressure of fluid flow in the hole and the force on the rock skeleton are internal forces. The effective stress that does not exist is defined for calculation and is derived from the effect of the combined action of the force equivalence principle \( \sigma \) and \( P \). Since the mechanical properties of rock disks are studied based on the concept of effective stress, there is no need to individually pay attention to the effects of other stresses such as void water pressure and full stress. Therefore, load analysis and test work will be greatly simplified.

In 1920, when engaged in the scientific research of geomechanics, Terzaki first proposed his famous theory. It establishes the position of the effective stress principle, and establishes a one-dimensional compression model of force on this basis. The effective stress is defined as follows:

\[ \sigma_{eff}^T = \sigma - P \]  

It plays a role in actual construction projects. According to the effective stress principle of Terzaghi, used in the construction of foundation pits and petroleum, and other industries, the strength accuracy of loose soil can be analyzed and calculated.

Tersaji’s effective stress formula is characterized by its simple writing and ease of use. However, in the subsequent application process, under slightly complicated conditions such as high pressure, this formula has some deviations. Therefore, from then on, many researchers have proposed a modified formula for Terzaghi’s effective stress, which can be expressed as follows:

\[ F_{\sigma_{eff}} = \sigma - P \delta \]  

The material composition of the rock, the internal structure of the rock, and the environment, etc., have various factors that affect the physical and mechanical properties of the rock, especially the sedimentary rock on the surface of the land is a representative of this type, and its generation is different from the environment. Magma Rocks, metamorphic rocks, and other rocks are very different. Because rocks with high porosity have relatively small strength, large deformation changes, and complex composition, the mechanical properties of rocks with high porosity are different from those of other types. The main factors that affect the elastic modulus of the rock in the formation are: the mineral composition of the rock, the porosity inside the rock, the pressure, temperature, and pore structure inside the rock. Therefore, the elastic modulus of rock may be a multivariate function. It is composed of parameters such as porosity, cement content, temperature, and pressure. There are many theoretical models to calculate the elastic modulus of rocks. Generally, there are three methods: direct measurement method, theoretical calculation method, and experimental method. Each method has advantages and limitations. Physical measurement is a method that combines all the parameters of the rock, including elastic modulus, porosity, temperature, and pressure of the formation environment.

In this paper, the traditional triaxial compression test is used to test the physical and mechanical properties of water-
bearing loose sandstone. The static elastic parameters of the rock are determined as follows:

\[
E = \frac{d\sigma_1}{d\varepsilon_1}, \quad v = -\frac{d\varepsilon_2}{d\varepsilon_1}
\]  

(5)

In the test, Poisson’s ratio is half of the compressive strength, and the ratio of the radial strain gradient corresponding to the corresponding axial strain gradient can be obtained. Poisson’s ratio is the most basic mechanical parameter showing the elastic deformation of rock. The Poisson’s ratio of different rocks has a specific value range.

\[
v = \frac{\text{“Slope at the midpoint of the axial deformation curve”}}{\text{“Slope at the midpoint of radial deformation curve”}}
\]

(6)

**Experimental design**

Figure 1 shows the force analysis of a rock sample in a compressive triaxial instrument. The limiting pressure and interstitial water pressure of the rock sample increase at a rate of 0.0167 MPa/s, and the axial load increases at a rate of 1.67 \(\mu\)m/s. These three parameters are controlled by independent hydraulic devices that can achieve higher accuracy.

When the saturated rock sample is installed on the test device, a heat shrinkable tube is used on the surface of the rock sample, which can penetrate the working oil in the pressure cylinder into the rock sample, causing damage to the test conditions and affecting the test results. When installing the axial and radial measuring devices, please be careful not to over-tighten or touch them. At the same time, the setting of the axial measuring instrument requires the auxiliary calibration of the level, and it is installed on the base of the testing machine while ensuring the level.

The analysis and test procedure of the relationship between the mechanical parameters of loose sandstone and the interstitial water pressure is as follows. The test samples are prepared with the same exposed bit, and the physical properties such as density and porosity are basically the same. Because the test operation is the same, if there is no difference between the samples before the experiment, the reliability of the contrast experiment can be improved. At this time, the limiting pressure is set to a fixed value of 35 MPa, and the gap water pressure is set in the order of 0 MPa, 5 MPa, 10 MPa, 15 MPa, and 20 MPa. In order to avoid discrepancies and improve the accuracy of the experiment, it is necessary to repeat the measurement of rock samples at least twice for each gap water pressure value.

According to the requirements of the operating specifications of the rock mechanics experiment, in order to confirm that the sample has not been subjected to shear damage before, in the test result step, first sample the limiting pressure of a specific size, and then add the interstitial water pressure. While gradually increasing the load, the gap water pressure must always be lower than the limit pressure value.

**Research methods of sports training management**

Sampling method: 100% of the 7 key universities were selected as the sample, 25% of the 29 general universities were selected as the sample, and 25% of the 57 colleges and universities were selected as the sample. 100% of the 9 high-level sports team colleges are the sample, and the 84 universities do
not operate 25% of the high-level sports teams, that is, 21 universities are selected as the sample. This sample includes 40 universities, including ordinary universities and technical colleges. This article takes university sports leaders, coaches, and athletes as the research objects.

The questionnaire survey followed the principle of random sampling and adopted a stratified sampling method. According to the sampling principle of the above proposal, a total of 40 universities were selected, and the sports instructors, coaches, and athletes of each school were surveyed. According to surveys conducted by several universities, teachers are asked for their opinions. The approximate ratio of university sports coaches, coaches, and athletes is 1:5:20. After the ratio was determined, a total of 1040 questionnaires were issued to these 40 universities (including 40 questionnaires for sports coaches and captains, 200 questionnaires for coaches and 800 athletes). In order to increase the recovery rate, the questionnaires are directly distributed and collected directly, with the support of teachers and students, or in an organic way. The specific data is shown in Table 1.

It can be seen from the above table that the actual recovery rate and recovery rate of the sports guidance questionnaire are 87.50% and 92.50%, respectively. According to the book “Sports Science Method”, it is necessary to confirm the standard of recovery rate. The standard line for mail surveys is 60%, and the standard line for field surveys is 90%. During the survey process, no rejections occurred during the face-to-face distribution and face-to-face questionnaire collection, and the actual recovery rate exceeded 90%.

According to the basic principles and methods of sport statistics and social survey statistics, this article uses Excel software to establish the original database for most of the valid data obtained from the questionnaire, and uses the SPSS13.0 system for processing and statistics to obtain reliable data.

### Results

#### Stress sensitivity analysis of loose sandstone based on pressure

Usually, the stress-strain curve is made through a triaxial compression test to study the mechanical properties of the rock. Lithology, limiting pressure, interstitial water pressure, temperature, load pattern, etc., there are many factors that affect the stress-strain curve. The compressive strength, elastic modulus, Poisson’s ratio and bulk modulus can be obtained from the stress-strain curve. By analyzing the trend of the curve, the deformation of the rock can be divided into several stages of elasticity, plasticity, and failure. There are various forms in the damage stage, including three main forms: brittleness, plasticity, and ductility. Through the tests in this section, as shown in Fig.2, a series of stress-strain curves can be obtained.

In the initial stage of axial load, the axial strain will increase significantly. This is the sealing stage of the pores and cracks of the test sample. After the initial stage of compression, the test sample enters the elastic stage where the stress-strain curve is close to a straight line. As the axial load increases, the axial strain and radial strain of the test sample become proportionally increased. After the test sample bears a certain amount of axial load, the stress-strain curve begins to flatten, and the rate of increase of strain accelerates. As the interstitial water pressure increases, plastic failure becomes more significant during the failure stage of the test sample. The rock model is the standard test sample size for the test process, with a diameter of 25mm and a height of 50mm. The geometric dimensions of the model set by the software are 0.025 meters in diameter and 0.05 meters in height. The parameters used in the model are determined based on the relevant data of loose sandstone. Through numerical simulation, Fig. 3 and Fig. 4 can be obtained. Figures (a) and (b) are strain diagrams equivalent to the axial strain diagram when the inclined plastic region appears.

Analysis of the above five sets of charts shows that under different pore pressures, when the inclined plastic zone first appears on the surface, the overall distribution rules of equivalent plastic strain and axial stress are consistent. The difference is the equivalent strain at the beginning of the inclined plastic zone, and the relationship is shown in Fig. 5. As the interstitial water pressure increases, the equivalent strain at the beginning of the inclined plastic zone decreases.

#### Stress sensitivity analysis of loose sandstone based on temperature

According to Fig. 6, the stress-strain curve of loose sandstone can be roughly divided into 4 stages, regardless of normal
temperature or high temperature. Initial stage: The stress-strain curve of the relaxed sandstone test piece becomes steeper as the axial load increases. This is because the small cracks and fine throats inside the rock pan are slowly closed by the external force acting on the test sample. Basically elastic deformation stage: this stage of loose sandstone is almost proportional. In other words, there is a linear relationship between stress and strain. The modulus of elasticity is the slope of the tangent to the midpoint of the phase. Plastic deformation stage: The initial internal loose sandstone refers to the strength of a small part of the inelastic phase, which may cause new cracks in the test sample. At the same time, the strength of the slightly higher part of the test sample also begins to enter the plastic stage. The curve has cracks at this stage before the development, but it will not continue according to the trend, but has a tendency to flatten. Failure stage: After the plastic deformation stage, the test specimen continues to be subjected to axial shear stress. After the final support stage, the cracks produced in the rock disk gradually connect to each other, forming large cracks visible to the naked eye, and the rock disk lacks the overall supporting force.

Figures 7 and 8 are obtained through numerical simulations. (a) and (b) are equivalent strain diagrams when the axial strain diagram and the inclined plastic region appear. Analysis of the following five sets of charts shows that the overall distribution of equivalent plastic strain and axial stress at the starting point of the inclined plastic region of the surface at different temperatures is consistent. The difference is the equivalent strain at the beginning of the inclined plastic zone. If the temperature rises, the equivalent strain at the beginning of the inclined plastic zone will decrease.

Analysis of the status quo of sports training management

The establishment of the school’s sports administrative guidance system, sports committee, and sports instructor group can reflect the school’s attention to school sports activities, and more importantly, the school instructor’s attention to after-school training. Whether the training after class is good or bad depends to a certain extent on the instructor’s understanding and attention to the training after class. The leadership of the school sports coach goes deep into the coaches and athletes, understands the situation of the training work, and can provide timely solutions. Regardless of whether the relevant departments of the school can cooperate and pay attention to the after-school training, these actions led by the school’s sports supervision may affect the after-school sports
development. From Table 2 and Table 3, it can be seen that in the 35 effective questionnaires on the leadership ability of sports coaching, 100% of the universities implemented secondary management, directly led by the vice president in charge of sports. 85.7% of key universities have sports committees, and 52.9% of ordinary universities (Bohan Technical College) have sports committees.

To sum up, compared with ordinary universities, key universities and universities with higher sports teams have great advantages in sports operation and management. Sports management in ordinary universities lacks standardization, systematization, and scientification. This will inevitably affect normal sports work and the smooth development of after-school training. On the whole, even for universities with key universities and high-level sports teams, specific links to sports activities have shortcomings. Whether the membership of the sports committee is stable and whether the sports committee has a work plan directly affects the healthy development of after-school training. Therefore, the setting of sports committees must be standardized. Through meetings and telephone interviews with some experts, I learned that the negligence of school leaders is the main reason for the lack of standardization and institutionalization of sports management.

The effective questionnaire survey (Table 4) of 173 University coaches on training motivation shows that the top three are “personal interest and concern for sports”, “work hard for the reputation of the school”, and “obey the arrangement of sports work”, which are 45.75%, 17.9% and 16.8%, respectively. Overall, these three projects still occupy the top three, accounting for 83.9%, 59.0%, and 49.1%, respectively. From these data, University coaches have a deeper understanding of after-school training, and can play an active role in after-school physical education combined with interest and sports work.

According to the survey results in Table 4, the cultivation of sports reserve talents ranked fifth, accounting for 20.8% of the total. These data show that after-school physical training is not satisfied with the country’s training of outstanding athletes. It can be seen from the statistics of the questionnaire that only some of the coaches from key universities and pilot universities have chosen this project. The coaches of ordinary universities and nonpilot colleges did not use this project as a candidate content at all. Through interviews with physical education teachers in several universities, we know that the cost of training sports teams is too high, and many have inputs but no output. This is the real reason why some universities
have not organized sports teams. In order to deal with competition, many universities can only deal with it through short-term intensive training courses. Therefore, the development of after-school physical training in ordinary universities is restricted.

Discussion

Analysis of the countermeasures of college sports administration

The leaders of each school must strengthen their understanding of the purpose of training. The training goal of a general-level university sports team is based on learning, and the principle of autonomy must be adopted. Through exercise, athletes must have the comprehensive development of morality, intelligence, and body, and the backbone of the university's future sports activities. The training goal of a high-level sports team is to train and cultivate socialist modernized professionals with outstanding personalities and comprehensive development, and to train and deliver outstanding sports talents at the same time. Each school implements relevant education policies according to its own characteristics.

In universities, the form of physical training after class cannot be too backward or too strict. In order to increase awareness, please change the training method. In the overall implementation of the education policy, and the full implementation of high-quality education, the implementation of one hour of physical activity a day has formed a regional characteristic. Through one hour of exercise, more students can participate in sports, and all students strive to become citizens with sports literacy. This also laid a solid foundation for after-school training.

Analysis of management countermeasures for college coaches

Strengthen the team building of coaches and improve the professional level of coaches

Today, sports technology and other aspects are highly developed, and outstanding professionals are the foundation and root of the development and survival of the sports team. The internal training environment of the sports team needs to be optimized, which is the main basis for improving the quality of the entire sports team. Among many factors, coaching is very important. The level of the coach directly affects the level of the athletes. Similarly, the level of training after college can also reflect the overall quality of the coach to a certain extent.

Fig. 7 Axial stress and equivalent strain diagram when the oblique plastic zone just appears at 20°C

Fig. 8 Axial stress and equivalent strain diagram when the oblique plastic zone just appears at 400°C
The transition from part-time coaches to full-time coaches

Through the investigation, we can know that the status quo of college coaches is part-time coaches. Therefore, the training workload statistics of coaches need to be strengthened to adapt to the actual situation of the school and affect the attention of team coaches. The teacher’s guidance work includes every coaching course, and then reduces the guidance tasks of other sports courses, and gradually shifts to the direction of full-time coaching. If the class time includes training sessions, the calculation method can be related to the performance of the sports team. If the tasks of training and competition are completed, all training time and content can be included. If the training time is not completed, the training time needs to be deducted.

Improve the system of competitive appointment of coaches

Because the training quality and competitive style of a sports team are mainly determined by the coach, the necessary scientific management and competitive employment should be carried out by the coach. From the comprehensive consideration of the teacher’s thinking, work style, professional knowledge, education level, etc., the best talents are selected as after-school training workers. Through communication with university leaders, when recruiting new physical education teachers, many universities will choose graduates from many majors, so coaches are required to continuously improve their professional abilities. In view of this situation, the university personnel department needs to recruit new personnel and assign tasks based on the professional ability and ideological style of physical education teachers. Teachers need to sign on the physical education research department and the following topics when they hold their posts.

| Table 2 Status of Sports Administrative Leadership in Universities |
|---------------------------------------------------------------|
| Serial number | Investigate subject                      | Key undergraduate colleges | Normal high school |
| 1             | Implement secondary management           | 7                         | 100 | 17 | 100 |
| 2             | Implement three-level management         | 0                         | 0   | 0   | 0   |
| 3             | Sports Committee                        | 6                         | 85.7| 9   | 52.9 |
| 4             | Sports committee members are stable      | 5                         | 71.4| 6   | 35.3 |
| 5             | Sports committee has a work plan         | 5                         | 71.4| 4   | 23.5 |

According to the topic, the education research department regularly checks the work of coaches, and coaches who cannot perform their duties or cannot perform tasks according to the plan will be dismissed.

Analysis of management strategies for college athletes

According to the current situation, the source of college athletes should focus on the development and benefit of the sports team, and cultivate preparatory talents. For the selection of university comprehensive sports teams, a trial contest will be held every year after enrollment of freshmen, and outstanding players will be selected from the freshmen of each department. The university’s high-level sports team should implement plans for the selection of pilot projects. University coaches directly observe the preparatory training of middle school athletes, start training people with sports talents from middle school, and ensure the quality of students. This is the way to choose sports talents.

Athletes should pay attention to the research of comprehensive theoretical knowledge of sports, including sports technical theory, the combination of professional knowledge and sports technology, sports nutrition, sports fatigue recovery, and other knowledge. Improve athletes’ attention to sports and broaden their horizons. Athletes can learn more knowledge of sports theory, which helps to analyze training and solve practical problems. Moreover, with a good knowledge structure, the ability to accept and understand will also improve. This is very helpful for correctly grasping the technical movement, understanding the training intention of the trainer, and implementing the entire training. By learning sports nutrition and restoring fatigue and other knowledge, you can consciously perform auxiliary work after training, and play a

| Table 3 Sports administrative leadership status of sports team colleges |
|---------------------------------------------------------------|
| Serial number | Investigate subject                      | Pilot high-level sports team academies | Do not pilot high-level sports team academies |
| 1             | Implement secondary management           | 9                         | 100 | 18 | 100 |
| 2             | Implement three-level management         | 0                         | 0   | 0   | 0   |
| 3             | Sports Committee                        | 9                         | 100 | 10 | 55.6 |
| 4             | Sports committee members are stable      | 7                         | 77.8| 7   | 38.9 |
| 5             | Sports committee has a work plan         | 8                         | 88.9| 5   | 27.8 |
positive role in the effective energy supply of athletes and the prevention of sports injuries.

**Analysis of management countermeasures for college sports venues**

The maintenance and management of sports facilities requires human resources. The material resources and financial resources are very large. The school must not affect the school’s sports during the after-school training. It adheres to the principle of mutual benefit to promote the team to the society and the market, forming a variety of financing structures; This is an effective means to solve the funding problem. According to the analysis of funding sources, most people think that cooperating teams with companies and sports associations is an ideal model.

**Conclusion**

From an objective and comprehensive point of view, this paper thoroughly studies the stress sensitivity of loose sandstone and sports training management based on image recognition, and then makes a comprehensive summary on this basis. The application of image recognition technology in the stress sensitivity of loose sandstone and the research status of stress sensitivity of loose sandstone at home and abroad are summarized. Then, analysis of the influence of the definition of image recognition. The image recognition process performs specific basic analysis at each stage of the decomposition of image preprocessing, and completes the operations of basic image characters such as shape, texture, and color, and expresses the visual hierarchy and computer vision system. The decomposition of the structure and the framework of computer vision theory are explained. In this paper, a servo-controlled triaxial rock mechanics experimental system is developed to analyze the mechanical parameters of loose sandstone influencing factors, and then perform uniaxial and triaxial compression tests. Through the analysis of the test results, the impact of the gap water pressure and temperature on the loose sandstone machinery can be obtained. The influence of parameters.

Normally, the after-school sports management system in universities lacks standardization and science. The specific manifestations are as follows: universities are directly led by the president and carry out secondary management, but some universities do not have sports committees and sports steering groups, committee members are unstable, and work plans have not been completed yet. The sources of athletes are diverse and the overall level is not high. High-level athletes are mainly concentrated in key universities and high-level sports teams. The uneven distribution results in the loss of sports talents.

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**Declarations**

**Competing interests** The authors declare no competing interests.

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