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# Artificial Intelligence Enhanced Health Research Influence of Football Culture on Physical Education in Chinese Colleges and Universities Amidst the Internet Era

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**Abstract.** To improve the effect of physical education reform, this paper combines the intelligent algorithm model to study the influencing factors of physical education in Chinese colleges and universities and integrates football culture into physical education. For sports image recognition, this paper proposes a tetrahedral meshing strategy based on the Delaunay principle combined with the growth method and an improved Delaunay tetrahedral meshing algorithm combined with the characteristics of sports. Moreover, this paper conducts in-depth research on the critical problems encountered in the study of tetrahedron in this paper, proposes solutions, and builds a system model of physical education reform. The experimental analysis shows that the effect of football culture on physical education is pronounced, and football culture can be integrated into physical education to improve the impact of physical education.

**Keywords:** football culture; physical education; influence; factor analysis; Artificial Intelligence; Health Research.
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## 1 INTRODUCTION

There is no fundamental conflict between cultural learning and football, nor is the relationship between water and fire. Football itself contains cultural content. If the culture is denied, it will lack the comprehensiveness of quality from the perspective of teaching and educating people in schools. Football culture should belong to the category of sports culture, but only using culture to explain

football seems to lack the charm of all of football. Although football is hailed as the world's No. 1 sport, few people define football culture as the world's No. 1 in the world. For example, human survival is inseparable from food, but food culture is challenging to be recognized as the world's first. It is necessary not to insist on the first place in the form and not only to look at football in terms of numbers so that school students can understand football, talk about football, play football, watch football, and pay attention to the rising tendency of football [6].

Any organization must align with team development and personnel cohesion; football is no exception. For the football culture on campus, there is no doubt that a positive and prosperous slogan concept is needed to establish a correct value orientation, guide the development of football activities, and serve as an essential benchmark for the construction of students' spiritual civilization to popularize football campuses thoroughly. This concept and spiritual connotation are not single; you can change the theme regularly by promoting happy football. Promoting football culture is a physical and mental activity that is conducive to the formation of healthy psychology. Moreover, we can encourage the fundraising of football games, gather strength through football games, and help poor students or people in need. Through the penetration of such ideas, students can gradually form the correct value orientation in the activities. At the same time, it is necessary to formulate a standardized football competition system, a perfect football culture system, and form a complete system from school management to student participation [11]. There are no rules or circles which are still valid for football. Therefore, all parties need to formulate fair and just game rules, transparent and open game referees, and strengthen the fair and strict system of football rules.

On the other hand, a complete football management system should also be formed. For example, professional football teaching institutions, event support institutions, football cultural publicity institutions, football peripheral design groups, etc., can be established in constructing the physical education system. In addition, it is necessary to formulate a complete "Plan for the Construction of Football Culture in the Campus System" and formulate short-term and long-term goals from the current problems. At the same time, it is necessary to realize the popularization of football sports on campus in three years, complete the comprehensive penetration of football culture in five years, and fulfill their respective responsibilities in multiple directions to promote the construction of football culture on campus [12].

The traditional teaching method is not suitable for football sports. To strengthen the students' understanding of the connotations of sports, we should innovate and reform sports teaching in multiple directions to create a teaching structure with characteristics and scale. Traditional football sports are carried out as student elective courses, and student associations are formed spontaneously. There needs to be more professional coaches. In the later reform, middle schools should formulate corresponding rules and regulations documents, combine classes with classes, strictly control the quality of football teaching, improve the syllabus, and implement this sport online and offline, such as promoting football teaching videos, WeChat lecture halls, and public accounts to promote football anecdotes, For important events, we can also organize collective watching of live broadcasts to pool the strength of football organizations [15]. The development of the team must be supported by economic support. To ensure the smooth progress of football activities, campus organizations can find the right channel resources to put campus football into society, rely on social resources to support campus football, and provide paid services for enterprises or groups through team publicity, event advertising, and activity support. Enterprises get publicity but also provide economic support for team construction. Both sides take what they need, which is win-win cooperation. We should focus on highlighting the critical role of students in the composition of football culture. Teachers only play a guiding role. In addition to explaining football knowledge in the classroom, we should also be good at guiding students to become interested in football and understand the connotations of football culture [9]. Teachers are encouraged to reflect on and improve the teaching process, formulate different teaching plans based on students' ability and

cognitive level, assign reasonable teaching levels, abandon the original teaching thinking, and fully implement innovative football classrooms [5].

The association is an essential activity in colleges and universities and an important carrier of football culture construction. In the past, most associations spontaneously organized and participated according to their interests, which is undoubtedly disadvantageous for those who need to learn about football. Schools should encourage associations to carry out football knowledge popularization activities and regularly hold football matches to mobilize everyone's enthusiasm. The associations provide a good football atmosphere for teachers and students with a sense of service and deepen football culture into the corners of campus culture [2]. For example, the association regularly goes deep into student groups, holds football knowledge competitions, guides students' interests through such activities, and takes the opportunity to popularize football culture. For the hardware facilities, the school should also strengthen the investment construction, enhance the material of football culture construction, increase the football field to meet the after-school requirements, increase the investment in football matches and football publicity, and comprehensively consider the needs of students. For night football activities, provide good lighting equipment for students with a weak foundation, provide professional training grounds or technical assistance, and timely supplement the football equipment, Formulate corresponding fund allocation plan, provide related encouragement for competitors, and build online and offline platforms accordingly, to permeate football culture from classroom to life [4].

The construction of college football culture can cultivate excellent teachers for campus football and lay a solid foundation for developing exceptional reserve talents. Therefore, constructing campus football culture in colleges and universities will help boost football teachers with culture, ideals, skills, and beliefs. The development of campus football has further strengthened the construction of college football culture, laid a foundation for college cultural exchanges, attracted more social groups and individuals to pay attention to college sports education culture, and promoted the construction of college campus culture [13]. The development of campus football has also announced the deepening and development of college football culture, enriched the knowledge and life of students majoring in physical education, and created an excellent football environment for the development of youth campus football. Strengthening the construction of football culture in colleges and universities can enrich the connotation of campus culture, enhance students' fighting spirit, and improve students' comprehensive quality [1].

The competition is becoming increasingly fierce, and the requirements for talent are also getting higher and higher. Therefore, in recent years, many colleges and universities have devoted most of their attention to cultivating and improving students' comprehensive quality and paid more attention to the construction of campus culture. The construction of campus culture has a vital positive significance for developing and promoting students' complete quality [14]. The spread of football team spirit has announced the construction of sports culture. The positive, optimistic, and upward spirit spread in sports culture has injected fresh blood into the construction of campus culture. The development of sports culture has played a perfect role in promoting the construction and development of campus culture in colleges and universities [7].

The college football match sounds informal, but compared with the social football match, the college football match is a microcosm of the social football match. The college football match is also a mass and economic sports event. In the process of sports, a large number of people need to be involved, and it will also include the competition of tactics and technology, as well as the psychological quality of the participants [3]. Establishing college football matches can cultivate the spirit of unity and cooperation among football teams. Still, the most important thing is to see the participants' ideological and moral character and style in the game process. If you want to win the football match, the participants' ethical culture must pass [10]. In the process of the game, no fraud can occur, and the interests of the whole team cannot be ignored because of personal interests. The

collective should be the core, and we should unite and cooperate. Only in this way can the final victory of the football game be achieved. The spirit of the football team mainly refers to the spirit of unity, cooperation, and perseverance conveyed by the football team during the game, and this spirit of unity, collaboration, and perseverance is just the moral and cultural spirit of the whole nation. It can be seen that football team spirit has a significant influence on the construction of college students' ethical culture [8].

This paper combines the intelligent algorithm model to study the factors influencing physical education in Chinese colleges and universities. It integrates football culture into physical education to improve its scientific nature.

## 2 3D GRID FEATURE RECOGNITION IN PHYSICAL EDUCATION TEACHING

### 2.1 Delaunay Tetrahedral Meshing

To promote the Delaunay principle in 3D, many theoretical problems remain, and research in this field needs to mature. Therefore, based on the Delaunay principle, this paper studies the tetrahedral meshing technology of scattered point sets in space and explores the generalization of this theory in three-dimensional space.

First, some concepts involved in meshing in three-dimensional space are explained.

Definition 1: When any surface of a convex polyhedron is used as the reference surface, and all the remaining surfaces are on the upper or lower part of the plane where the surface is located, the section that cuts the convex polyhedron from any direction is a convex polygon.

Definition 2: The intersection of two adjacent surfaces of a polyhedron is called the edge of the polyhedron, and each surface is called the face of the polyhedron.

1. The algorithm performs discrete processing on the model nodes to obtain a discrete point set $\square\Omega$;

2. The algorithm sorts the discrete point set. The sorting criteria are as follows: point sets are sorted according to the size of the Z-axis coordinates, from small to large. If the Z-axis coordinates are equal, the point sets are sorted from small to large by the Y-axis coordinates. If the Z and Y-axis coordinates are similar, the point set is sorted according to the X-axis coordinates from small to large, and finally, the sorted point set point(i,j) is obtained.

3. The algorithm calculates the convex hull element surrounding the point set according to the node distribution of the discrete point set. In this paper, the convex hull is designated as a regular hexahedron element, and the following eight formulas obtain the coordinates of the eight vertices of the convex hull:

(minx−(maxx−minx)/2,miny−(maxy−miny)/2,minz−(maxz−minz)/2)

(maxx+(maxx−minx)/2,miny−(maxy−miny)/2,minz−(maxz−minz)/2)

(maxx+(maxx−minx)/2,maxy+(maxy−minx)/2,maxz+(maxz−minz)/2)

(minx−(maxx−minx)/2,maxy+(maxy−minx)/2,maxz+(maxz−minz)/2)

(minx−(maxx−minx)/2,miny−(maxy−miny)/2,maxz+(maxz−minz)/2)

(minx−(maxx−minx)/2,maxy+(maxy−miny)/2,minz−(maxz−minz)/2)

(maxx+(maxx−minx)/2,maxy+(maxy−miny)/2,minz−(maxz−minz)/2)

(maxx+(maxx−minx)/2,miny−(maxy−miny)/2,maxz+(maxz−minz)/2)

4. The algorithm performs tetrahedral mesh division on the large hexahedral convex hull surrounding the discrete point set and first obtains five auxiliary tetrahedral elements, as shown in Figure 1(a);

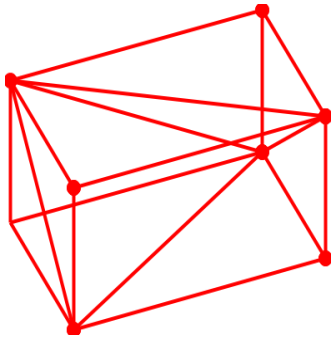
5. The algorithm uses the point-by-point insertion algorithm to insert the nodes in point(i,j) into the convex hull in turn;

6. The algorithm determines which tetrahedral element the newly inserted node falls in and forms a new tetrahedral element with the new node and the four faces of the tetrahedral element. Moreover, the algorithm uses the LOP optimization criterion to optimize the mesh, update the tetrahedral set and point(i,j) node set, and eliminate the original tetrahedral elements;

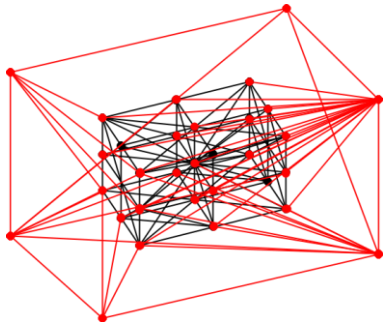
7. The algorithm updates the sequence number of the inserted node, jumps to step 5, and repeats the above process;

8. If the point(i,j) is empty, the algorithm performs edge recovery and face recovery, as shown in Figure 1(b);

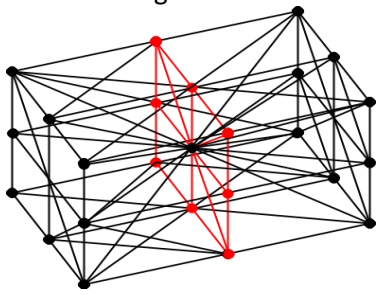
9. The algorithm removes the auxiliary tetrahedral elements to obtain a meshed mesh, as shown in Figure 1(c), and the algorithm ends.



(a) Hexahedral convex hull diagram



(b) Meshing process of point-by-point insertion algorithm



(c) The segmentation result after removing the auxiliary tetrahedral element

**Figure 1:** Meshing.

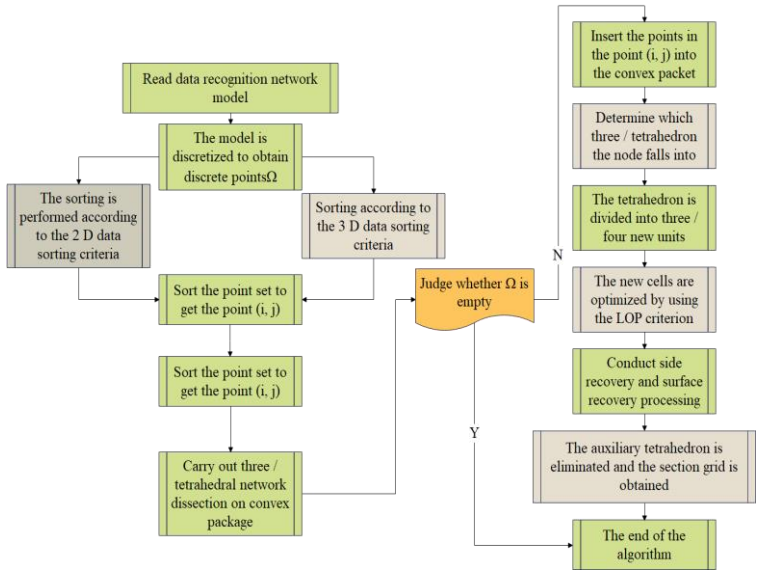



**Figure 2:** Flow chart of the tetrahedral Delaunay algorithm.

## 2.2 Critical Issues in Delaunay Tetrahedral Mesh Generation

However, unlike 2D triangulation, when tetrahedral meshing a model in 3D space, the empty circumscribed sphere test criterion is not equivalent to the minimum solid angle-maximization criterion. The open circumscribed sphere test criterion only approximates maximizing the minimum solid angle. The resulting mesh is not necessarily optimal, and this situation cannot be changed within the scope of the study of Delaunay's principle. The solution to the problem needs to be improved by relevant scholars who propose new theories. In this section, the Delaunay meshing of the tetrahedron directly uses the minimum solid angle-maximization criterion to judge.

The specific calculation form of the solid angle of the tetrahedron in this paper is as follows:

Definition 1: The solid angle refers to constructing a unit sphere with the observation point as the sphere's center. The area of any object projected onto the unit sphere is the solid angle of the object relative to the observation point.

Definition 2: The solid angle in space tetrahedral meshing refers to Taking the vertex of the tetrahedron as the center and the unit length of 1 as the radius as a sphere, the area value of the spherical part enclosed by the intersection of the three sides of the extension lines of one or more sides of the obtained sphere and the vertex is the solid angle, as shown by the shaded part in Figure3.

As shown in Figure 3, it is troublesome to calculate the area of the shaded part in the figure directly in three-dimensional space. Therefore, in this section, the area of the surface enclosed by the three abc points is replaced by the area of the triangle surrounded by the three abc points.

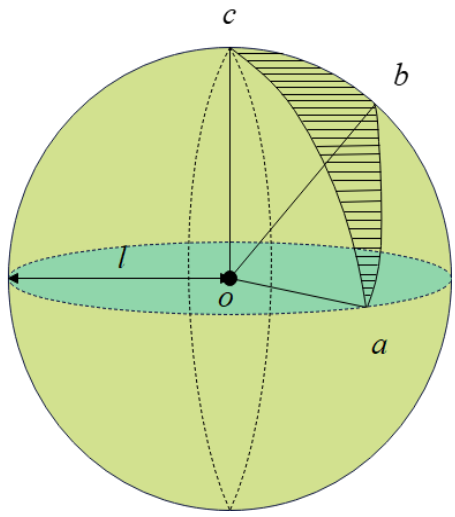



**Figure 3:** Schematic diagram of solid angle.

The specific implementation method of the solid angle equivalent algorithm:

$$\overrightarrow{oa} = a(x_{i2}, y_{i2}, z_{i2}) - d(x_{i1}, y_{i1}, z_{i1}) \tag{1}$$

$$\overrightarrow{ob} = b(x_{i3}, y_{i3}, z_{i3}) - d(x_{i1}, y_{i1}, z_{i1}) \tag{2}$$

$$\overrightarrow{oc} = c(x_{i4}, y_{i4}, z_{i4}) - d(x_{i1}, y_{i1}, z_{i1}) \tag{3}$$

$$\overrightarrow{aa} = \frac{\overrightarrow{oa}}{|\overrightarrow{oa}|} \tag{4}$$

$$\overrightarrow{bb} = \frac{\overrightarrow{ob}}{|\overrightarrow{ob}|} \tag{5}$$

$$\overrightarrow{cc} = \frac{\overrightarrow{oc}}{\overrightarrow{oc}} \tag{6}$$

$$\overrightarrow{vec1} = \overrightarrow{aa - bb} \tag{7}$$

$$\overrightarrow{vec2} = \vec{a}a^{-}\overrightarrow{cc} \tag{8}$$

$$\vec{n} = \overrightarrow{vec1} \times \overrightarrow{vec2} \tag{9}$$

$$s = 0.5 \times |\vec{n}| \tag{10}$$

It has been explained above that in implementing Delaunay's principle, the solid angle is the angle corresponding to the area of a curved surface on the surface of the unit sphere, and the plane angle is the angle related to the length of an arc on the unit circle. As shown in Figure 4, for two arcs with arc lengths $m1$ and $m2(m1 < m2)$ respectively in the unit circle, it can be concluded that the arc with a longer arc corresponds to a more significant chord. We can judge the angle size by the chord length corresponding to the arc.

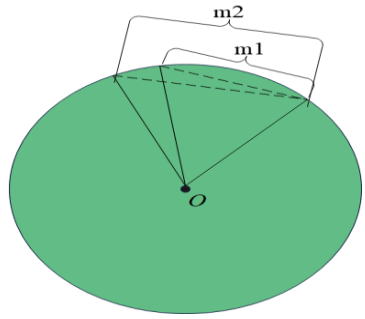
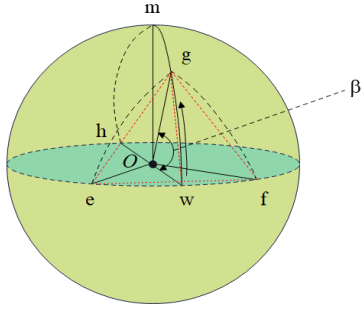
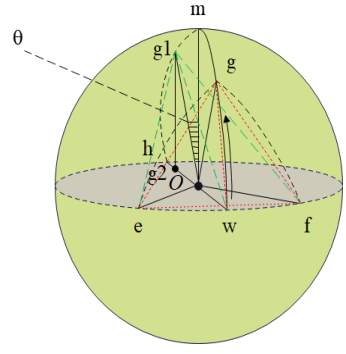


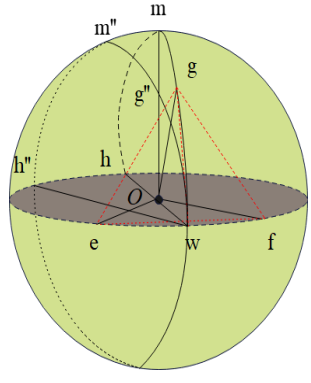

**Figure 4:** The chord length is opposite the arc length.




(a) Point g moves along a semicircle




(b) Point g moves along a semicircular arc




(c) Point Gs moves along a non-semi-circular arc

**Figure 5:** g-point moving image.

As shown in Figure 5(a), the triangle corresponding to the area enclosed by the curved surface of the unit circle is an egg.

1. The graph of point g moving along the w-m arc is shown in Figure 5(a).

$$S_{efg} = 0.5^{*}ef^{*}gw \tag{11}$$

Among them, ef is fixed $gw = r^{*}\,sin(\beta)(0° \le \beta \le 90°)$, so when the g point moves $\beta$ along $w - m$, the height y increases with the increase of gw.

2. The graph of point g moving along the arc $m - g$ is shown in Figure 5(b).

$$S_{efg} = 0.5^{*}ef^{*}g1w \tag{12}$$

$$g1g2 = r^{*}\,cos(\theta) \tag{13}$$

$$g2w = t + r^{*}\,sin(\theta) \tag{14}$$

$$g1w = \sqrt{g1g2^2 + g2w^2} \tag{15}$$

After simplification, we get:

$$g1w = \sqrt{t^2 + r^2 + 2 * t^{*}r * sin(\theta)} \tag{16}$$

It can be seen from the simplified expression that $g1w$ increases with the increase of $\theta(0° \le \theta \le 90°)$.

3. If the circle where the semicircular arc along point g is located does not pass through the center of the sphere, as shown in Figure 5(c), it can still be proved by a similar method at this time, except that the line segment g2w does not pass through the center O.

This situation will likely be encountered when using the Delaunay criterion for tetrahedral meshing. When optimizing with the LOP criterion, it is necessary to compare the solid angle of adjacent tetrahedral elements to determine whether face flipping is required. This paper makes the following provisions: if the three solid angles of the tetrahedron are respectively more significant than the solid angles corresponding to its adjacent tetrahedron, then it is optimal at this time, and no LOP optimization is required. Suppose two of the three solid angles of the tetrahedron are more significant than the solid angle corresponding to the adjacent tetrahedron. In that case, the LOP optimization process still needs to be performed. LOP optimization is achieved if one of the three solid angles of the tetrahedron is larger than the solid angle corresponding to the adjacent tetrahedron. If the three solid angles of the tetrahedron are all smaller than the solid angle related to the adjoining tetrahedron, LOP optimization processing is performed. The final result is a tetrahedral mesh element.

The detailed process of improving the algorithm is as follows:

1. The algorithm discretizes the entity to be divided and places the surface and internal nodes in.

2. The sorting principle is consistent; the algorithm sorts the surface and internal nodes. Such a sorting process improves the selection efficiency of the nodes that are to be selected later.

3. The algorithm performs Delaunay triangulation on the scattered nodes on the solid surface and sorts the divided surface mesh elements.

Sorting principle: When sorting surface triangle elements, each triangle element node must be arranged counterclockwise from the inside to the surface; its normal vectors must point to the interior of the entity.

4. The algorithm starts with the surface mesh element and determines the fourth node, which constitutes the tetrahedral element, according to the following three judgment criteria.

5. The algorithm updates the surface mesh, adds the new surface of the newly generated tetrahedron to the surface mesh set, removes the triangular element used twice (the surface element once), and jumps to step 4 until the set is empty.

6. The algorithm ends.

## 3 RESEARCH ON THE INFLUENCE OF FOOTBALL CULTURE ON PHYSICAL EDUCATION IN CHINESE COLLEGES AND UNIVERSITIES UNDER THE BACKGROUND OF THE INTERNET

The deepening and promotion of campus football will inevitably involve integrating and constructing campus culture. The unity of the two must achieve the unity of paths. First, it is necessary to understand the path, that is, through top-level design, the innovative ideas of the design plan have always been in a state of seeking truth from facts and steadily advancing, and the scientific nature of teaching and educating people is highly consistent with the actual needs of football entering the campus. The second is the method path. Grasping the proportions of football in the teaching process of physical education can make the practical and functional density appropriate, as well as the degree of separation and integration, and avoid excessive emphasis on competition. The third is the supervision path. On the implementation path under construction, the campus football should be viewed from the development perspective, and the necessary supervision mechanism is still required. Under this mechanism, the school education management department of the Municipal Education Bureau and the sports competition management department of the Sports Bureau should jointly coordinate and implement. The fourth is the evaluation path. It does not regard football entering the campus as an administrative order to be enforced mechanically with a single assessment standard. It has innovative ideas regarding scientificity, flexibility, pertinence, and continuity, and process evaluation replaces result evaluation. The implementation path of campus culture construction under the premise of football entering the campus is shown in Figure 6.

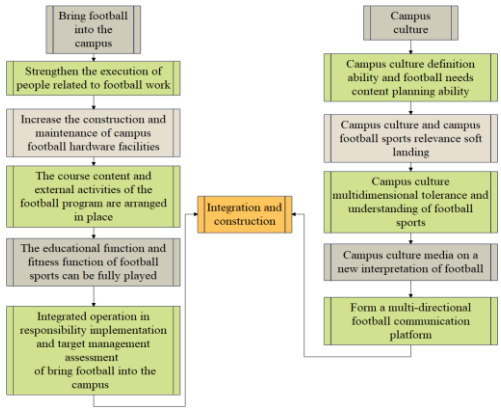



**Figure 6:** The implementation path map of campus culture construction under the premise of football entering the campus.

Combining online informatization teaching with traditional offline classroom teaching methods guides students in identifying the basic knowledge of online autonomous learning and collaborative learning mode recognition courses. Teachers are mainly responsible for inspiring, instructing, solving puzzles, and emphasizing the critical content of the course offline. The blended teaching model constructed in this paper is shown in Figure 7 and is divided into three stages: before, during, and after.

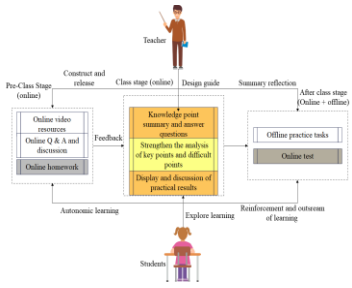



**Figure 7:** Physical education system model.

Combined with the algorithm in the second part, motion recognition is applied to physical education, as shown in Figure 8, which is the digital recognition of football motion images.

(a) Recognition of sketches of football images

(b) Background depiction of football images

(c) Digital recognition of football images

**Figure 8:** Digital recognition of football images.

Figure 8 shows that the algorithm in the second part of this paper can play an essential role in the image recognition of physical education. Then, the effect of football culture on physical education is verified, and the experimental results shown in Table 1 are obtained.

| *NO.* | *Influence effect* | *NO.* | *Influence effect* | *NO.* | *Influence effect* |
|---|---|---|---|---|---|
| *1* | *88.363* | *21* | *84.372* | *41* | *88.770* |
| *2* | *86.459* | *22* | *87.306* | *42* | *83.943* |
| *3* | *83.557* | *23* | *86.085* | *43* | *86.214* |
| *4* | *90.134* | *24* | *83.846* | *44* | *83.474* |
| *5* | *87.727* | *25* | *89.859* | *45* | *81.206* |
| *6* | *84.858* | *26* | *83.991* | *46* | *80.027* |
| *7* | *80.361* | *27* | *90.044* | *47* | *84.861* |

| | | | | | |
|---|---|---|---|---|---|
| 8 | 87.516 | 28 | 90.940 | 48 | 79.465 |
| 9 | 89.185 | 29 | 84.276 | 49 | 90.686 |
| 10 | 83.876 | 30 | 90.908 | 50 | 79.575 |
| 11 | 86.664 | 31 | 85.772 | 51 | 82.397 |
| 12 | 79.037 | 32 | 84.233 | 52 | 84.634 |
| 13 | 86.777 | 33 | 83.065 | 53 | 87.610 |
| 14 | 87.694 | 34 | 83.832 | 54 | 90.936 |
| 15 | 90.386 | 35 | 83.871 | 55 | 81.134 |
| 16 | 81.221 | 36 | 79.749 | 56 | 79.507 |
| 17 | 85.371 | 37 | 86.464 | 57 | 79.136 |
| 18 | 90.124 | 38 | 85.284 | 58 | 80.655 |
| 19 | 85.004 | 39 | 88.514 | 59 | 82.656 |
| 20 | 82.051 | 40 | 87.138 | 60 | 82.011 |

**Table 1:** The effect of football culture on physical education.

Table 1 shows that the influence of football culture on physical education in this paper is undeniable, and football culture can be integrated into physical education to improve its effect.

## 4 CONCLUSIONS

The concept of football entering the campus and campus football itself has the same and unified concept. Since football can be promoted to various schools as one of the ways to educate people, it must be kept on the school campus to emphasize the particularity of football. Football is recognized as the No. 1 sport in the world, and there is no contradiction between the student group and the football that ordinary people know. Football rules and operations cause problems and difficulties in the student body. For example, a large amount of exercise consumes a lot of physical energy, the requirements for venue facilities are relatively high, the confrontation in the physical contact is more intense, and the game time is longer than other ball events. However, the two sides show that the student group needs to popularize football to educate people. Other sports often unmatch mental exercise, physical tests, team cohesion, complex challenges, and the joy of victory. This paper uses the intelligent algorithm model to study the factors influencing physical education in Chinese colleges and universities. The experimental analysis in this paper shows that the influence of football culture on physical education is undeniable, and football culture can be integrated into physical education to improve the effect of physical education. Incorporating AI into health research on football culture and physical education offers a promising avenue to design tailored programs that leverage cultural interests to motivate student engagement in physical activities. Ethical considerations and cultural appreciation play a vital role in maximizing the potential benefits of AI-driven insights within this health and education research domain.

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*Jian Wang,* https://orcid.org/0009-0001-0522-6565

## REFERENCES

[1] Ashland, A.; Rabe, S.; Müller, S.; Sattler, I.; Heimann-Steinert, A.: Algorithm Based on One

Monocular Video Delivers Highly Valid and Reliable Gait Parameters, Scientific Reports, 11(1), 2021, 1-10. https://doi.org/10.1038/s41598-021-93530-z
[2] Bakshi, A.; Sheikh, D.; Ansari, Y.; Sharma, C.; Naik, H.: Pose Estimate Based Yoga Instructor, International Journal of Recent Advances in Multidisciplinary Topics, 2(2), 2021, 70-73.
[3] Bhombe, J.; Jethwa, A.; Singh, A.; Nagarhalli, T.: Review of Pose Recognition Systems, VIVA-Tech International Journal for Research and Innovation, 1(4), 2021, 1-8.
[4] Colyer, S. L.; Evans, M.; Cosker, D. P.; Salo, A. I.: A Review of the Evolution of Vision-Based Motion Analysis and the Integration of Advanced Computer Vision Methods Towards Developing a Markerless System, Sports Medicine-Open, 4(1), 2018, 1-15. https://doi.org/10.1186/s40798-018-0139-y
[5] Díaz, R. G.; Laamarti, F.; El Saddik, A.: DTCoach: Your Digital Twin Coach on the Edge During COVID-19 and Beyond, IEEE Instrumentation & Measurement Magazine, 24(6), 2021, 22-28. https://doi.org/10.1109/MIM.2021.9513635
[6] Ershadi-Nasab, S., Noury, E., Kasaei, S., &Sanaei, E.: Multiple Human 3d Pose Estimation from Multiview Images, Multimedia Tools and Applications, 77(12), 2018, 15573-15601. https://doi.org/10.1007/s11042-017-5133-8
[7] Li, Z.; Bao, J.; Liu, T.; Jiacheng, W: Judging the Normativity of PAF Based on TFN and NAN, Journal of Shanghai Jiaotong University (Science), 25(5), 2020, 569-577. https://doi.org/10.1007/s12204-020-2177-0
[8] Liu, J. J.; Newman, J.; Lee, D. J.: Using Artificial Intelligence to Provide Visual Feedback for Golf Swing Training, Electronic Imaging, 2021(6), 2021, 321-1. https://doi.org/10.2352/ISSN.2470-1173.2021.6.IRIACV-321
[9] McNally, W.; Wong, A.; McPhee, J.: Action Recognition Using Deep Convolutional Neural Networks and Compressed Spatio-Temporal Pose Encodings, Journal of Computational Vision and Imaging Systems, 4(1), 2018, 3-3.
[10] Nagalakshmi Vallabhaneni, D. P. P.: The Analysis of the Impact of Yoga on Healthcare and Conventional Strategies for Human Pose Recognition, Turkish Journal of Computer and Mathematics Education (TURCOMAT), 12(6), 2021, 1772-1783. https://doi.org/10.17762/turcomat.v12i6.4032
[11] Nie, X.; Feng, J.; Xing, J.; Xiao, S.; Yan, S.: Hierarchical Contextual Refinement Networks for Human Pose Estimation, IEEE Transactions on Image Processing, 28(2), 2018, 924-936. https://doi.org/10.1109/TIP.2018.2872628
[12] Nie, Y.; Lee, J.; Yoon, S.; Park, D. S.: A Multi-Stage Convolution Machine with Scaling and Dilation for Human Pose Estimation, KSII Transactions on Internet and Information Systems (TIIS), 13(6), 2019, 3182-3198. https://doi.org/10.3837/tiis.2019.06.023
[13] Sárándi, I.; Linder, T.; Arras, K. O.; Leibe, B.: Metrabs: Metric-Scale Truncation-Robust Heatmaps for Absolute 3d Human Pose Estimation, IEEE Transactions on Biometrics, Behavior, and Identity Science, 3(1), 2020, 16-30. https://doi.org/10.1109/TBIOM.2020.3037257
[14] Xu, J.; Tasaka, K.: Keep Your Eye on the Ball: Detection of kicking Motions in Multi-View 4K Soccer Videos, ITE Transactions on Media Technology and Applications, 8(2), 2020, 81-88. https://doi.org/10.3169/mta.8.81
[15] Zarkeshev, A.; Csiszár, C.: Rescue Method Based on V2X Communication and Human Pose Estimation, Periodica Polytechnica Civil Engineering, 63(4), 2019, 1139-1146. https://doi.org/10.3311/PPci.13861