Research Article

Multi-source Intelligent Management System of College Snow and Ice Teaching Based on Cloud Platform

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The conventional college snow and ice teaching multi-source resource intelligent management system has the problem of incomplete software resource analysis function, which leads to high CPU usage of system. A cloud platform based college snow and ice teaching multi-source resource intelligent management system is designed. Hardware part: record the state of the pins when the register is reset, account for the data bit width and storage capacity of DDR2 SDRAM memory, and optimise the data storage module; Part of the software: obtain ice and snow sports course objectives in colleges and universities, rationally organise the course organization form, optimise the intelligent management mode of teaching multi-source resources by using the cloud platform, support online browsing of various text resources, set relevant parameters to construct various random modification operations, and design the software resource analysis function with the knowledge fusion algorithm. Experimental results: The average CPU usage of the multi-source intelligent resource management system for snow and ice teaching in colleges and universities in this paper and the other two systems is 34.257%, 47.458%, 53.578%. Experimental results show that the performance of multi-source intelligent resource management system for snow and ice teaching in colleges and universities has been significantly improved after making full use of cloud platform.

1. Introduction

The curriculum setting structure, course organization form, course content, and teaching methods and means are directly related to students’ learning interest and learning effect, thus affecting the smooth development of the teaching of ice and snow sports [1, 2]. The teaching effect is directly related to the physical quality of the talents trained in colleges and universities. Various policies, conditions and efforts can promote the rapid development of physical education in colleges and universities. The implementation of ice and snow sports education plan cannot be separated from the ice and snow curriculum. We should start from the daily school curriculum, vigorously support the “ice and snow into campus” plan, and establish regular campus ice and snow sports activities and competition mechanism. In order to promote the development of ice and snow sports curriculum, the improvement of the theoretical system of ice and snow sports curriculum can provide reference for the teaching of ice and snow sports. One of the key factors is to strengthen the scientific research of physical education teaching. However, owing to the unique nature of the sporting circumstances, ice and snow sports can only be done in the winter, on an ice rink or a snow field, therefore they are more different in terms of sports [3, 4]. In the winter, snow and ice sports will be a fantastic alternative for physical activity, as they are more appropriate for physical activity, may increase physical quality while also exercising people’s willpower and assisting them in overcoming fear. Colleges and institutions who have yet to establish snow and ice courses should develop ideal settings based on local conditions and provide comprehensive and diversified winter sports teaching material. Only by widening our ideas can we overcome many challenges in college physical
education instruction and encourage students to engage gladly and actively in winter physical education.

2. Hardware Design of Multi-Source Resource Intelligent Management System for Ice and Snow Teaching in Colleges and Universities

The hardware part of the design system, targeted optimization for the circuit part. According to the core data processor selection requirements of the system, we mainly consider the C672x series floating point DSP chip of the C67x family, which mainly includes C6722, C6726, C6727 and C6720. In the hardware design of the experimental system, we choose TMS320C6722B as the core data processor of the system based on the principle of the highest cost performance of the chip, the industrial standard requirements of the chip and the simple TQFP package form. Among them, CPU, storage controller and memory use SYSLCK1. The hardware storage scheme is shown in Figure 1:

As can be seen from Figure 1, ADC converts the signal to be measured and then the LUDS receiver module inside FPGA processes the speed of the signal in accordance with 1:4 de-serial deceleration to obtain 128 bit data. The 128 bit data is the common waveform data of sub-ADC cores I and SUB-ADC cores Q. If the two sub-adcs work independently, the 128 bit data is used to convert the two signals to be tested. Peripheral devices and dMAX use SYSLCK2, and SYSLCK3 is dedicated to EMIF. If the two sub-ADCs alternately sample in parallel according to time, the 128 bit data is converted to a certain signal to be tested. The C6722B supports only one hard boot option, that is, from the internal ROM address 0 × 0000 0000. The soft initiator contained in the ROM implements the other boot options. A single channel’s maximum data storage depth is 256 Mpts, which refers to the ADC’s maximum storage capacity after analog-to-digital conversion of the measured signal at the fastest real-time sampling rate of 2 GS/s. The data rate of the ADC output is as high as 500 Mbps when the ADC operates at the greatest real-time sampling rate of 2 GS/s, and the high-speed data stream is slowed down according to 1:4 disconnection to achieve stable data storage. High-speed data flow deceleration processing ensures reliable data storage, but it also introduces a new problem: the data bit width increases from 32 to 128 bits, making data storage more challenging. The soft starter uses CFGPINO and CFGPINI registers, which capture several device pin states during reset to determine which startup mode to enter. The STM32F103 2 incorporates on-chip high-speed memory (up to 512 KB Flash and 64 KB SRAM) and rich and enhanced peripherals and I/O ports connected via the APB bus. All devices provide standard communication interfaces (up to 2 I2C interfaces, 3 SPI interfaces and 5 USART interfaces). It also comes with two 12 bit ADCs, a 12 bit dual-channel DAC, and 11 16 bit timers. Currently, the DDR2 SDRAM provides the following data bit widths: 8 bit, 16 bit, and 32 bit. Considering that the data bit width of the high-speed data output by ADC increases to 128 bits after the destrating and decelerating process of the LUDS receiver, it is necessary to consider the data bit width and storage capacity DDR2 SDRAM memory when selecting DDR2 SDRAM memory chips. The larger the storage capacity is, the better the data bit width is. Based on the above description, complete the steps of hardware design of multi-source intelligent management system for ice and snow teaching in colleges and universities.

3. Software Design of Multi-Source Intelligent Management System for Snow and Ice Teaching in Colleges and Universities

3.1. Obtaining the College Ice and Snow Sports Course Objectives. Ice and Snow course is a fitness, practical and popular course, from the perspective of broadening the employment of students, its other goal is to train our students, so that they have the practical ability to act as referees, organise competitions and guide social sports. Students consider many aspects when choosing ice and snow courses. At present, there are three main types of class organization, as shown in Figure 2:

As can be seen from Figure 2, there are mainly ordinary classes, college classes, and centralized classes. In addition, compared with the current situation of ice and snow sports in some ordinary universities, we can see that there is a big deviation between the actual content of ice and snow sports and students’ intention to choose winter sports. Many students are very interested in other types of courses and are willing to experience and participate in them [5-7]. Currently, the snow and ice courses offered by some ordinary universities in the winter are primarily speed skating, despite the fact that many students are very interested in other types of courses and are willing to experience and participate in them. College categorization is that all students are separated into classes based on their department, with big and small classes, resulting in a significantly higher variety of teaching methods. Co-class teaching is another popular method of ice sports instruction, and it relates to how various classes come together for class. We may include more detailed and deeper objectives in the goal formulation to make our ice and snow project curriculum more flawless and favourable to teacher
implementation and make it a typical course of colleges and universities. Students have a broad variety of activities and are more subject to external influence since ice and snow sports courses must be conducted at ice and snow sports facilities, thus a good organisational form is a vital requirement. Only reasonable course organization can give better play to the teaching effect [8]. Because ice and snow sports courses need to be carried out in specific ice and snow sports venues, they are more susceptible to external influence. Ice and snow sports venues are generally larger in size, and the range of student activities is greater than in other sports. There may be a variety of natural environments as well as obstacles or hidden areas, and if the curriculum organization form is not properly organised, ice and snow sports teachers will be unable to provide unified regulation to their students. This can also affect the teaching process of ice and snow sports classroom teachers. Therefore, it is necessary to rationally plan the effective development mode of ice and snow sports courses. Based on the above description, complete the steps to obtain the goal of ice and snow sports courses in colleges and universities.

3.2. Cloud Platform Optimization Teaching Multi-source Resource Intelligent Management Mode. Cloud platform is leading the Internet into a new era, and major Internet enterprises are launching their own service platforms for cloud computing [9–11]. As its name implies, Cloud platform relies on cloud computing technology to provide users with powerful computing capacity through a huge number of Internet servers, usually tens of thousands or even millions of servers [12, 13]. Scalability refers to the rapid expansion and release of the services provided by the cloud platform. The available resources are infinite in the eyes of users, who can obtain the required resources at any time [14, 15]. Virtualization is one of the core technologies of cloud computing. The cloud can decompose and combine storage and computing resources through virtualization based on users’ requirements for on-demand renting. As a new service mode, cloud computing can be divided into three categories according to the construction site of cloud computing platform, protocol type of cloud service and cloud service object, namely, public cloud, private cloud and hybrid cloud [16, 17]. For multi-source resources of snow and ice teaching in colleges and universities, the basis of network teaching is hardware, software and network teaching resources [18]. According to the principle of cloud computing, after obtaining the current alternative measurement, it is necessary to search the database to prepare the data required for subsequent processing, that is, to find out the information of the target measurement in the previous sampling period. When equivalent measurement is dynamic, it is necessary to correct the state estimation vector of alternative measurement to the observation time, then the expression formula of predicted value is:

\[
\delta_{(t)} = \Phi \frac{1 + l}{(s - e)^2}.
\]  

In formula (1), \( s \) represents observation time, \( e \) represents distance of measurement position, and \( l \) represents unknown noise. After the calculation results are obtained, it is necessary to carry out threshold filtering. This step mainly uses statistical or physical methods to remove the incorrect measurement and other interfering factors in the process of correlation, which can reduce the amount of calculation and improve the correlation speed and real-time processing. The expression formula of state vector in this state is:

\[
h = \frac{1}{w}(g - s) e^2.
\]

In formula (2), \( w \) represents measurement matrix, \( g \) represents data gate, and \( s \) has the same meaning as formula (1). The core of network teaching is the construction of teaching resources, the quality of teaching resources is directly related to the quality of network teaching, large-scale popularization and application of network teaching, the construction of large teaching resources. With the rapid advancement of Internet technology in the direction of broadband, high-speed, multi-media, hardware and software will gradually deteriorate, and the development of teaching resources will become increasingly important, eventually becoming the determining factor in the success of network teaching. And network teaching resource library is the most important part of teaching resource construction. In addition, the system also needs to support a variety of audio resources fast online games, the core content of video teaching resource intelligent management system, the acceptance of the smooth play influence system, if the video playback is not smooth can reduce the use of user interest, so you need to optimize the video playback, to meet the student and teacher users under the condition of existing network for quick access. The multisource resource intelligent management mode, so that teachers and students’ teaching and learning activities are not restricted by time and space. Teachers are no longer direct educators, educational goals are realized through network courses, and teaching activities are carried out around network courses. Therefore, developing high-quality course teaching resources suitable for network teaching has become a very important and urgent topic for colleges and universities to develop network teaching. The commonly used teaching multi-source resources are shown in Table 1:
Knowledge fusion algorithm is to fuse Analysis Function.

3.3. Knowledge Fusion Algorithm Design Software Resource

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Based on the above description, the steps of optimizing the

system, and can only browse and search the intelligent

and other functions. Students have the least authority in the

formation modification, resource upload, download, search

module in the system. Teachers have their own user in-

resource management module, and system management

administrator can manage the resource service module, intelligent

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management system of college digital teaching resources.

Based on the above description, the steps of optimizing the

intelligent management mode of teaching multi-source

resources are completed.

As can be seen from Table 1, network teaching has the

characteristics of rich teaching resources, sharing of teaching

resources, being free from time and space restrictions, di-

versified content, multi-media information forms and net-

worked teaching methods. The system needs to support the

online browsing of various text resources, such as PPT, Word and Txt, etc. The traditional way is to use different

ways for different types of processing, which will increase the
difficulty of development, and is not conducive to improving

the user experience, so it needs to use a unified way to

browse text resources. Multimedia network teaching in the

field of education, especially in colleges and universities, is

the importance of scientific management and efficient ap-

lication of teaching resources which is gradually recog-

nized. The user management module mainly includes user

information management and authority management. The

purpose of user information management is to save and

manage comprehensive information about users in the

system. Granting varied rights to different users in the

system is what permission management is all about. Basic

information such as user accounts and passwords is included

in the user information. In addition, the system adminis-

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Based on the above description, the steps of optimizing the

intelligent management mode of teaching multi-source

resources are completed.

3.3. Knowledge Fusion Algorithm Design Software Resource

Analysis Function. Knowledge fusion algorithm is to fuse

existing knowledge elements according to certain con-

straints to generate new available knowledge objects, and

update the original knowledge elements according to the

obtained results. The whole process is a processable

implementation process. Since the result of knowledge fu-

sion is not unique, the knowledge elements are extended and

open, meaning that the combination of knowledge elements

may be between two objects or multiple objects, which will

lead to a large scale of fusion results. Even the knowledge

objects that are considered “wrong” or “not completely
correct” in the fused result set may be verified as legitimate in

the application process. So the openness of extension

knowledge in knowledge fusion processing at the same time,

must be considered after the operation of knowledge ele-

ments to reasonable control the scale; in the process of

applying the algorithm, it is necessary to try to set relevant

parameters to construct various operations with random

changes, and then judge whether these changes are correct

according to the results of practical application, and make

corrections at the same time. The randomness of knowledge

update emphasizes that it is difficult to predict the evolution
direction of the knowledge fusion process, and it is difficult
to design the knowledge fusion algorithm that evolves to a

specific trend. Therefore, the observed values in the algo-

rithm need to be converted, and the expression formula is as

follows:

$$|y(\eta + 1)| = \lambda \sqrt{\eta^2}. \quad (3)$$

In formula (3), $y$ represents detection probability, $\eta$ represents observation dimension, and $\lambda$ represents target density. According to formula (2), the size of a gate is generally measured by its area. Then, the area expression formula of rectangular gate is:

$$S = (1 - \phi_{ij}) \prod_{j=1}^{i} k. \quad (4)$$

In formula (4), $\phi$ represents the number of elements, $k$ represents the associated gate constant, and $i, j$ represents two adjacent components respectively. In order to solve this problem, it is necessary to set relevant constraint conditions, and at the same time, it is necessary to set relevant fitness parameters in the knowledge fusion algorithm, so as to carry out a reasonable range control of the solution space scale generated by knowledge fusion. Under the same condition of different component associated gate constants, formula (4) is normalized, and the calculation formula is as follows:

$$S' = \frac{k^T}{\phi_{ij}}. \quad (5)$$

In formula (5), $T$ represents component dimension, and the other variables have the same meanings as formula (5). Within the scope of physical education teaching in colleges and universities, teachers and students are participants in teaching activities, and their experience is closer to the needs of system users [19–21]. When creating campus network teaching resources, do not just focus on pictures, text, animation, resources, and other ready-made materials; also, do

| Serial number | Name                  | Interpretation                                                                 |
|---------------|-----------------------|-------------------------------------------------------------------------------|
| 1             | Media material        | The basic material unit for disseminating educational information              |
| 2             | Online test library   | A self-contained and independent database organised according to certain     |
|               |                       | knowledge points                                                             |
| 3             | Online course library | Teaching software that presents a subject through the internet and organizes    |
|               |                       | it according to the knowledge structure of the subject curriculum             |
| 4             | The question bank     | The collection of test questions and corresponding statistical analysis tools  |
| 5             | Case                  | A representative event or phenomenon                                           |

Table 1: Common types of multi-source teaching resources.
not forget about the most important teaching activities involving interactive relationships between teachers and students, as well as their teaching activities and teaching process resources. The construction of teaching resources for the ice-snow project in college physical education teaching should adhere to the “open and dynamic” construction view, teaching activities and teaching process resources into the construction of campus network teaching resources [21–23]. Realizing the development of resource construction from the concept of “library” to the dynamic concept of “flow” resources. When students need to systematically recommend courses, the project needs to be expressed as the vector of user dimension, so the expression formula of similarity between users and courses is:

\[ \varphi = \frac{|L - p|^2}{\sigma(p)} \]  

(6)

In formula (6), \( L \) represents user preference, \( p \) represents user dimension, and \( \sigma \) represents item set. Teachers and students add their own teaching experiences and learning processes (such as students’ electronic portfolios, teachers’ and students’ discussions) to the system. The resource analysis module is mainly composed of functions such as auditing, publishing, storage management and information classification of teaching resources. The user’s scoring matrix of the project can be used to obtain the representation of the user and the project in the low-dimensional space through matrix decomposition technology. In this way, the similarity of user to user, project to project and between user and project can be obtained through vector similarity calculation. Then the expression formula of factorization is:

\[ Q_{\min} = (d - f) \frac{1}{\sum_{i=1}^{n} f_i^2} \]  

(7)

In formula (7), \( d \) represents implicit data weight and \( f \) represents open source big data project. It can be seen from the above description that the establishment and setting of elliptic and rectangular gate is in rectangular coordinate system, while the fan gate is in polar coordinate system. The calculation formula of target measurement parameters is as follows:

\[ |\omega(m + 1)| = \sqrt{\omega^2 + m(1 - f)} \]  

(8)

In formula (8), \( \omega \) represents the corresponding predicted value, \( m \) represents the covariance, and \( f \) has the same meaning as formula (7). Resource audit mainly refers to the evaluation of teaching resource information uploaded in the system by the system administrator to ensure that teaching resources meet the requirements of the system. The resource resolution module system uses Tika to deal with, Tika is an Apache project like Lucene, and the two can be used together well. Tika is a content analysis tool with a powerful parser tool class that can parse common file formats, such as DOC, PDF, ZIP, XML, etc. It can also process non-formatted text well. Meanwhile, Tika can parse given URL addresses. After parsing, the metadata file created is simple to handle. After logging in to the intelligent management system of ice and snow teaching resources in colleges and universities, administrators can manage the teaching resources of the system. Teaching resource management mainly refers to the examination and approval of the teaching resources after the implementation of the system, and the classification and
the above description, complete the steps of designing the resource resolution module consists of bulletin machinery, log management, database management and system maintenance. Resource resolution is mainly used to comprehensively maintain the system to ensure stable running of the system. Bulletin resource resolution manages bulletin information released by the system. Log resource resolution is used to manage log information about users’ access to the system. Database resource resolution is to manage the data storage information in the system. System maintenance is the premise of ensuring the normal operation of the system, and escorts the security and stability of the system. Based on the above description, complete the steps of designing the software resource parsing function.

4. Simulation Experiment Analysis

4.1. Building an Experimental Environment. The server uses a 2.0 GHz or higher quad-core CPU, 4 GB DDR3 or higher memory, 2 TB hard disk, and 512 MB independent graphics card. The hardware environment of the client is 1.8 GHz or higher dual-core CPU, 1 GB or higher memory, 500 GB or higher hard disk, and 512 MB or higher independent graphics card. Install the development platform Eclipse and the Application server Tomcat, and start Eclipse after the installation. Select Preferences in the Window menu of Eclipse and expand Application Servers in Eclipse and select Tomcat to complete the configuration. In addition, this platform uses MySql small database, install MySql software, set user name and password during installation, used to log in to the database. Network equipment: over 100 M network adapters, network cards, and network cables. The software environment consists of a client and a Server, which are constituted as follows: Server software environment: Windows Server is used as the operating system, SQL Server enterprise edition is used as the database management system, and the application software installed on the Server is the digital teaching resource management system of colleges and universities. Client software environment: The operating system is Windows 7, and Internet Explorer 8.0 or later is installed. We deployed 100,000 pieces of data in the database as required by the business. The equipment used in the test is the current popular hardware configuration, and then the multi-source intelligent resource management system for snow and ice teaching in colleges and universities is tested.

Table 2: Average CPU usage of the three systems (%).

| Number of concurrent users | Intelligent management system of multi-source resources for college ice and snow teaching based on collaborative filtering algorithm | Intelligent management system of multi-source resources for ice and snow teaching in colleges and universities based on cluster analysis | The multi-source resource intelligent management system of college ice and snow teaching in this paper |
|----------------------------|--------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|
| 20                         | 21.215                                                                    | 21.025                                                                  | 11.201                                                               |
| 40                         | 18.163                                                                    | 27.844                                                                  | 9.166                                                                |
| 60                         | 22.205                                                                    | 25.277                                                                  | 10.348                                                               |
| 80                         | 66.198                                                                    | 72.069                                                                  | 56.227                                                               |
| 100                        | 69.336                                                                    | 75.366                                                                  | 54.546                                                               |
| 120                        | 68.205                                                                    | 77.171                                                                  | 48.188                                                               |
| 140                        | 66.884                                                                    | 76.294                                                                  | 50.124                                                               |

In formula (9), $\kappa$ represents corresponding measurement information, $n$ represents probability data, and $\omega$ has the same meaning as formula (8). Resource publishing is the system administrator to publish the teaching resources that meet the requirements of the system after review. Resource information classification is mainly to classify teaching resource information according to the information of teaching resources. The resource analysis function is mainly to store teaching resources in the corresponding subject subdirectory after information classification. The resource resolution module consists of bulletin machinery, log management, database management and system maintenance. Resource resolution is mainly used to comprehensively maintain the system to ensure stable running of the system. Bulletin resource resolution manages bulletin information released by the system. Log resource resolution is used to manage log information about users’ access to the system. Database resource resolution is to manage the data storage information in the system. System maintenance is the premise of ensuring the normal operation of the system, and escorts the security and stability of the system. Based on the above description, complete the steps of designing the software resource parsing function.

4.2. Analysis of Experimental Results. The experimental test was carried out in order to examine the application impact of the multi-source intelligent management system for ice and snow education in colleges and universities. The following were the performance test’s goals: First, the system’s performance bottleneck was discovered by testing in the current testing environment. Second, it can not only fulfill the criteria of system user reaction time in the defined test environment, but also test the CPU utilisation of the system under a specific quantity of data. Based on the cluster analysis of the multisource resource intelligent management system for snow and ice teaching based on the collaborative filtering algorithm, more snow and ice teaching resources were tested in the system experiment. Under the condition of measuring different numbers of concurrent users, the CPU utilization rate of the three types of systems was significantly improved, as shown in Figures 3 and Figures 4.
According to Figures 3 and 4, the average CPU usage of the three systems can be obtained, as shown in Table 2: it can be seen from Table 2 that the average CPU occupancy of the multi-source resource intelligent management system for college ice and snow teaching in this paper and the other two systems are 34.257%, 47.458%, 53.578%.

5. Conclusion

According to the actual situation, the system integrates and utilizes the multi-source resources of ice and snow sports and physical education, and innovates the teaching methods and means. In addition, the teaching effect is improved, and the students’ learning and sports ability is comprehensively and comprehensively improved. It has laid a theoretical and practical foundation for the relevant research in the academic circles. Due to the limited research conditions, the accuracy of the design system needs to be studied in more detail.

Data Availability

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

Conflicts of Interest

The authors declare that they have no conflicts of interest.

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References

[1] J. Liu, S. Yang, and D. University, “Research on the development path of Shanghai ice and snow sports,” Bulletin of Sport Science & Technology, vol. 16, 2020.
[2] J. Wang, Z. Zhu, R. Tan, and L. Dong, “Research on recognition of ice and snow athletes based on feature extraction and cloud computing platform,” Microprocessors and Microsystems, vol. 80, Article ID 103388, 2020.
[3] S. S. Komissarov, “Mechanics of side-slipping in alpine skiing: theory of machining snow and ice,” Sports Engineering, vol. 24, no. 1, pp. 1–9, 2021.
[4] J. Hamil, A. Triplett, M. Vorkapich, and J. Pivarnik, “Comparison of off-ice and on-ice performance tests in collegiate ice hockey players: 1466 board #60 May 28 9: 30 AM-11: 00 AM,” Medicine & Science in Sports & Exercise, vol. 52, 2020.
[5] V. Rosso, V. Linnamo, Y. Vanlandewijck et al., “Evaluating objective measures of impairment to trunk strength and control for cross-country sit skiing,” Sports Engineering, vol. 24, no. 1, pp. 1–12, 2021.
[6] E. Haugom, I. Malasevska, and G. Lien, “The relative importance of ski resort- and weather-related characteristics when going alpine skiing: data from a rating-based conjoint survey-sciencedirect,” Data in Brief, vol. 37, 2021.
[7] O. Elmark, K. E. T. Giljarhus, F. F. Liland, L. Oggiano, and R. Reid, “Aerodynamic investigation of tucked positions in alpine skiing,” Journal of Biomechanics, vol. 119, 2021.
[8] M. Gilgien, P. Crivelli, and L. S. Luteberget, “Preventing injuries in alpine skiing giant slalom by shortening the vertical distance between the gates rather than increasing the horizontal gate offset to control speed,” British Journal of Sports Medicine, vol. 54, no. 17, 2020.
[9] S. Zhang, J. Liao, S. Wu, J. Zhong, and X. Xue, “A traceability public service cloud platform incorporating ID code system and colorful QR code technology for important product,” Mathematical Problems in Engineering, vol. 2021, Article ID 5535535, 15 pages, 2021.
[10] S. Liu, Y. Dai, Z. Cai, and X. C. Pan, “Construction of double-precision wisdom teaching framework based on blockchain technology in cloud platform,” IEEE Access, vol. 9, pp. 11823–11834, 2021.
[11] S. Kianoush, S. Savazzi, M. Beschi, S. Sigg, and V. Rampa, “A multisensory edge-cloud platform for opportunistic radio sensing in cobot environments,” IEEE Internet of Things Journal, vol. 8, no. 2, 2021.
[12] J. Yun, K. W. Park, D. Koo, and Y. Shin, “Lightweight and seamless memory randomization for mission-critical services in a cloud platform,” Energies, vol. 13, 2020.
[13] H. Zhao, Z. Liu, X. Yao, and Q. Yang, “A machine learning-based sentiment analysis of online product reviews with a novel term weighting and feature selection approach,” Information Processing & Management, vol. 58, no. 5, Article ID 102656, 2021.
[14] X. Liu and C. Yang, “Remote music teaching classroom based on embedded system and cloud platform,” Microprocessors and Microsystems, vol. 82, p. 103844, 2021.
[15] S. Bar, B. R. Parida, and A. C. Pandey, “Landsat-8 and sentinel-2 based forest fire burn area mapping using machine learning algorithms on GEE cloud platform over Uttarakhand, Western Himalaya,” Remote Sensing Applications: Society and Environment, vol. 18, Article ID 100324, 2020.
[16] Q. Hou, Y. Xing, D. Wang, J. Liu, X. Fan, and Y. Duan, “Study on coupling degree of rail transit capacity and land use based on multivariate data from cloud platform,” Journal of Cloud Computing, vol. 9, no. 1, pp. 1–12, 2020.
[17] H. Zheng-peng, Y. Zhou, L. Bi-wei et al., “The method of selecting storage nodes in multi secret data partition of cloud platform,” Computer Simulation, vol. 37, no. 11, pp. 375–379, 2020.
[18] T. Al-Jody, H. Aagela, and V. Holmes, “Inspiring the next generation of HPC engineers with reconfigurable, multi-tenant resources for teaching and research,” Sustainability, vol. 13, 2021.
[19] M. Yildiz, Y. Ontürk, and E. Efek, “Asian journal of education, training the investigation of multiple intelligence modalities of university students receiving sports education,” Asian Journal of Education and Training, vol. 6, 2020.
[20] Y. Ding, Y. Li, and L. Cheng, “Application of internet of things and virtual reality technology in college physical education,” IEEE Access, vol. 991 page, 2020.
[21] D. Li, C. Yi, and Y. Gu, “Research on college physical education and sports training based on virtual reality technology,” Mathematical Problems in Engineering, vol. 2021, 2021.
[22] J. P. Agans, O. W. A. Wilson, and M. Bopp, “Required health and wellness courses: associations with college student physical activity behavior and attitudes,” *Journal of Physical Activity and Health*, vol. 17, no. 6, pp. 632–640, 2020.

[23] T. N. O. Northrup, J. Grant, M. F. Weikle et al., “Translating school physical education and activity policies into Practice: a case study,” *Translational Journal of the American College of Sports Medicine*, vol. 5, 2020.

[24] S. Hong and A. L. Jung, “Influence of athletes’ self-management strategies on athlete satisfaction and stress levels,” *Research in Dance and Physical Education*, vol. 5, 2021.

[25] K. Bi, “Relationship between learned resourcefulness and academic procrastination in students studying in sports departments,” *International Education Studies*, vol. 13, 2020.