Journal of Combinatorial Mathematics
and Combinatorial Computing
www.combinatorialpress.com/jcmcc

Application of multimedia-based network teaching platform in college physical education teaching

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ABSTRACT

Under the open education system, college physical education multimedia network teaching involves complexity and diversity. To improve the efficiency of such teaching, this paper proposes an information fusion model based on big data resource scheduling for online courses. The design incorporates a software platform built in an embedded Linux environment, including several key modules such as the database module, multimedia information resource sampling module, embedded program processing module, and multimedia human-machine interaction control module.The platform aims to enhance teaching and learning experiences in college physical education by offering students an interactive and comprehensive learning environment. Key components of the platform design include the user interface, the database module, and the information fusion model. The platform utilizes Excel and Access technology for data collection and database construction within the open education system. Additionally, a quantitative recursive analysis method is applied to design the algorithm for multimedia network teaching information fusion and scheduling under a linear programming model.The algorithm integrates into the platform using the instruction dynamic loading module, which loads it into the system control terminal and the information processing center. After successful loading, the algorithm is executed for various tasks related to information fusion and scheduling. This feature allows for the efficient management of resources and data.Furthermore, the platform supports cross-compilation and multi-mode control of multimedia network teaching information in a cloud computing environment. By combining embedded software design techniques, the software development of the management platform is realized. The results demonstrate that the platform's multi-mode integration and scheduling abilities are enhanced, and its real-time retrieval and access capabilities are stronger, thereby improving the quality of multimedia network teaching in college sports.

Keywords: multimedia network, Teaching platform, Colleges and universities, Physical education, database

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Received 25 February 2024; Revised 10 April 2024; Accepted 15 December 2024; Published Online 16 April 2025.
DOI: 10.61091/jcmcc127b-255

1. Introduction

Multimedia online teaching platform refers to the use of computer network technology, combined with multimedia technology and teaching methods, to provide a comprehensive, efficient, and interactive online learning environment for teachers and students. This platform typically includes functions such as online courses, teaching videos, audio, textbook resources, testing and quizzes, allowing for flexible learning anytime, anywhere.

Through the multimedia network teaching platform, students can access richer educational resources and improve learning efficiency. Teachers can also monitor and guide students' learning through the platform, achieving more personalized education.

Some highly popular multimedia online teaching platforms include MOOC (Massive Open Online Curriculum), EdX, Coursera, Xuetang Online, NetEase Cloud Classroom, and more. These platforms provide rich online learning resources through cooperation with universities and well-known institutions, covering knowledge points and skill development in various industries.

Multimedia technology has strong multimedia characteristics. In the teaching process, multimedia network teaching can provide a friendly platform interface by applying multimedia technology and internet technology, and can comprehensively display and analyze the teaching contents through multimedia (images, sounds, animations), By incorporating the information fusion and scheduling algorithm into the college sports multimedia network teaching platform using the instruction dynamic loading module, we facilitate students' intuitive understanding of the teaching contents. This is because the algorithm streamlines data processing and resource allocation, which improves the overall efficiency of the platform. As a result, students are provided with a user-friendly interface that enables them to access the teaching materials, interact with them, and learn at their own pace. In essence, the implementation of the algorithm enhances the quality of learning and helps students achieve their academic goals. Thus strengthening their knowledge learning and enabling students to acquire knowledge in vivid multimedia teaching[1]. For example, as mentioned in the concept of physical education in colleges and universities, physical education, as an educational process, has the same place as other disciplines. They are all bilateral activities of teaching and learning, which are purposeful, planned and organized processes of education, upbringing and development under the guidance of teachers, focusing on learning indirect knowledge[2].

The multimedia network teaching platform is a modern teaching method that can fully utilize new technologies such as computers, the Internet, and multimedia to transform traditional teaching content into digital, networked, and multimedia forms. It can achieve innovation in teaching modes such as distance education and autonomous learning through the Internet. The first step in building a platform is to digitize and network teaching resources, including course content, teaching materials, teaching videos, teaching demonstrations, etc., which can be easily accessed by teachers and students anytime and anywhere. The platform can fully utilize multimedia technology, enrich teaching content, create more teaching methods and methods for teachers, and make it easier for students to understand and absorb knowledge. The platform can provide personalized educational services based on students' different needs and interests, making them more proactive and proactive in learning. The platform can provide teachers with more efficient and flexible teaching tools, saving teaching time and reducing their work pressure. Building a multimedia network teaching platform is a part of school informatization construction, which can promote the process of school informatization construction and improve the overall competitiveness of the school.

With the rapid development of systematic information management in colleges and universities, intelligent and integrated requirements are put forward under the open education system. By constructing network teaching platform under the open education system, the information management of teachers and students, teaching resources, scientific research projects, logistics, books and other network teaching can be realized. Under the open education system, there are many

kinds of network teaching, and the system complexity is high. It is a systematic project for network teaching under the open education system, and the management of teaching information is based on the database construction and data information fusion processing of network teaching information. The optimized database structure model of information under the open education system is designed, and the network teaching platform under the open education system is built to promote the development of college construction towards informationization[3]. Under the open education system, network teaching is complex and diverse. The current college physical education multimedia network teaching platform adopts three-layer network architecture design, and realizes database development and information retrieval of management information system through single-mode control. With the complexity of system management and the expansion of data processing scale, the compatibility and expansibility of network teaching platform under the open education system are not good.

2. General design description of platform

2.1. Overall design framework

In order to realize the design of college sports multimedia network teaching platform under open education system and optimize the extraction of network teaching and resource information under open education system, Firstly, we analyze the design framework that operates under the open education system. This comprehensive analysis reveals the most effective strategies and techniques to achieve the desired results. Our focus is to develop an efficient and user-friendly platform that aligns with the specific needs of college students. The aim is to enable them to access high-quality educational resources and facilitate their learning process without any obstacles. This involves integrating a range of multimedia resources and dynamic loading modules to ensure that students have a seamless learning experience. Additionally, the platform incorporates an algorithm that streamlines data processing and resource allocation. The end result is a robust college sports multimedia network teaching platform that facilitates intuitive learning and empowers students to achieve their academic goals. Multi-mode control bus scheduling technology is used to collect the information and data of college sports multimedia network teaching management under the open education system, and the development and design for the open education system is being executed utilizing the embedded kernel. LabWindows/CVI is used to develop the code resources of the platform. Under the open educational system,platform is mainly divided into database module, embedded program processing module, instruction dynamic loading module and multimedia man-machine interaction control module. Under the open education system, the college sports multimedia network teaching platform adopts three-layer middleware structure design, which are the bottom layer of information database, the middle layer of data processing and the application layer of human-computer interaction. The global metadata management technology is adopted to automatically link the physical storage location, relevant characteristics and status of all college sports multimedia network teaching information. In SaaS layer, the queuing mechanism of data output of college sports multimedia network teaching platform under open education system is determined. According to the server load status and resource utilization rate, the resources under open education system are adaptively allocated, optimally deployed and automatically managed. According to the above design principles, the overall structure is shown in Figure 1.

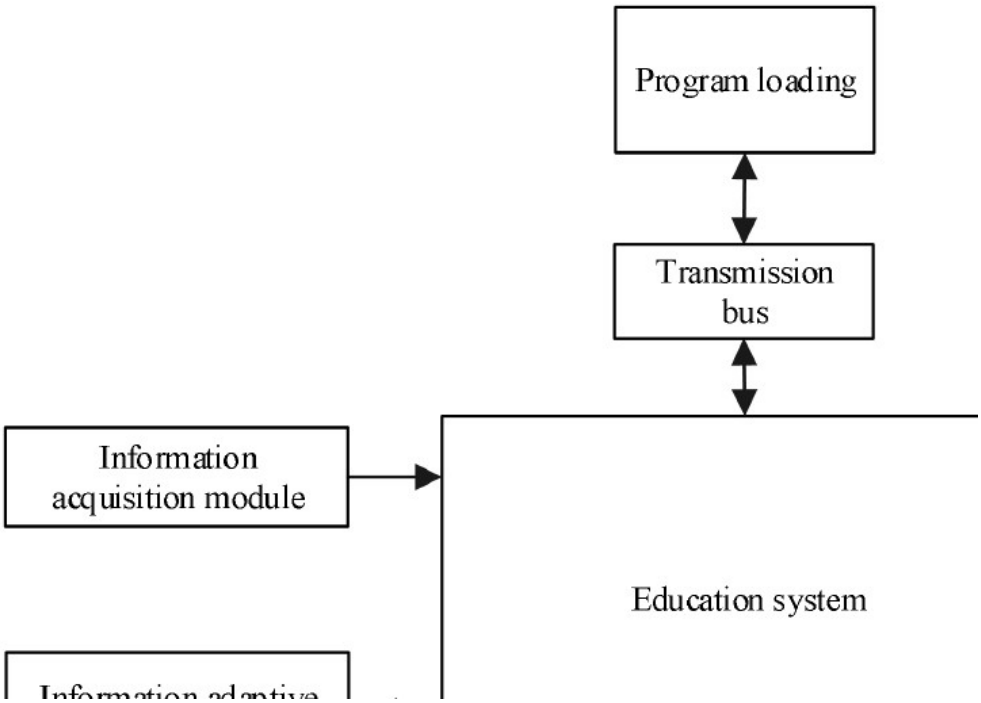


Fig. 1. Overall structure

According to the overall design framework of the platform shown in Figure 1, the development of teaching platform under open education system is carried out in embedded Linux environment. The networking design system adopts ZigBee protocol for wireless communication networking and campus network access networking. The software development design of management platform includes database construction, algorithm programming and application development of information scheduling and database access.

2.2. Description of development environment and technical indicators

Under the open education system, the software development of teaching platform is based on Visual DSP++4.5 development platform. Excel and Access technologies are used to realize the data collection and database construction of network teaching information under the open education system. The communication networking technology of the platform adopts packet switching networking design. Packet switching network refers to a communication method that converts data into packets and exchanges these packets between multiple nodes. The design of packet switching networks usually involves the following aspects: bandwidth: Each node in a packet switching network can connect many other nodes, so bandwidth is an important factor to consider when designing a packet switching network, including maximum bandwidth, average bandwidth, etc. Routing method: Packet switching networks need to determine the path along which each data packet is transmitted, which requires the use of an effective routing algorithm. Usually, routing algorithms use known factors such as the distance from the router to the target node, network topology, and congestion between nodes to calculate the optimal path. Caching and Congestion Control: Congestion refers to the phenomenon of traffic congestion or congestion in a network, and it is necessary to design reasonable caching and congestion control mechanisms to solve this problem. Security: In packet switching networks, data is transmitted between multiple nodes, so it is necessary to design reasonable security measures, such as encrypting data packets, authentication, etc. Topology structure: Designing an efficient, reliable, and flexible topology structure is the key to designing packet switching networks. Generally speaking, the topology should be able to provide high availability while avoiding excessive network load and congestion.

The basic bus data transmission rate of the bottom database for the transmission and scheduling of college sports multimedia network teaching information is 40Mbyte/sec, and the bandwidth can reach 12dB, with a frequency band of 868MHz/915MHz/2.4GHz. Under the open education system, the working speed of the distribution nodes in the middle layer of college sports multimedia network teaching platform is between 20 and 20~250kbps, and the maximum number of nodes is 65,536, which can meet the function of network teaching and visiting under the open education system[4]. Under the open education system, the network topology of teaching platform adopts three structural forms: star, tree and net, as shown in Figure 2.

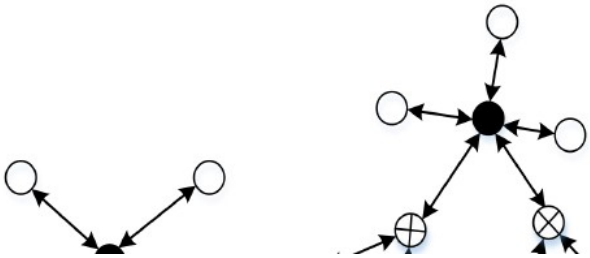


Fig. 2. Network topology structure

In order to reduce the use and maintenance cost, the average repair time of the designed platform under the open education system is less than 15min. The data transmission system of the sensor module has a high coverage rate, and ZigBee communication nodes have dynamic coverage capability.

ZigBee is a short distance, low speed, and low-power wireless communication protocol mainly used for communication between IoT devices. The communication distance is generally around 10-100 meters, making it suitable for small-scale low-speed data transmission. It supports multiple topological structures, including star, mesh, point-to-point, etc., and can achieve self-organization and self-healing capabilities. Its communication speed can range from 20kbps to 250kbps, making it suitable for low-speed data transmission. The transmission can use a 256 bit AES encryption algorithm to ensure communication security. It can also achieve various network management functions, including network discovery, node joining, parameter configuration, etc., improving the reliability and flexibility of the network. Its characteristic is that it supports multiple topological structures, has high security and network management capabilities, and can achieve self-organization and self-healing capabilities.Therefore, ZigBee network communication protocol is adopted to design the network communication of network teaching platform under the open education system[5]. In order to improve the communication coverage ability, each Sink node and Source node in the network can accurately identify the triggered control instruction and wake up from the sleep mode in time, thus effectively reducing the system power consumption, improving the signal coverage and reducing the possibility of packet loss in data transmission. Under the open education system, generates the clock through MPLL phase-locked loop, NAND Flash starts the data loader, configures the sampling clock of A/D module, and uses JN5139 wireless microprocessor to trigger ARM module to complete the Linux kernel triggering and cross-compiling design. DSP is equipped with an external FLASH memory to read and dispatch the management information of network teaching in real time under the open education system, and ZigBee network module is used to realize the remote transmission and online access information data[6].The system comprises memory, CPU (controller and arithmetic unit), input devices, and output devices. For input, commonly used devices include digital cameras, scanners, video capture cards, microphones, modems, network adapters, disk drives, CD-ROM drives, tape drives, keyboards, mice, sound cards,

MIDI synthesizers, and pen input devices.On the output side, the system typically utilizes devices such as printers, disk drives, CD recorders, tape drives, monitors, sound cards, amplifiers, speakers, film recorders, high-brightness projectors, MIDI synthesizers, and network adapters.This description presents the core hardware components, categorized into input and output devices, that play a crucial role in the system's functionality.[7].

By describing the development environment and technical specifications of the teaching platform, the software and hardware environment used, as well as specific technical implementation methods, can be used to guide developers. Based on the development environment and technical specifications, the required development tools, operating systems, program languages, and specific technical implementation methods can be determined, thereby ensuring the stability and reliability of the platform and effectively improving the work efficiency of the teaching platform, Reduce development time, reduce development costs, facilitate maintenance and upgrades, and ensure the normal operation of the platform.Ensuring Platform Security: The security guidelines in the development environment and technical specifications can help developers improve code security, avoid potential security vulnerabilities, and thus ensure platform security. Easy to maintain and upgrade: The development environment and technical specifications can help maintenance personnel better understand the technical implementation and architecture of the platform, thereby better carrying out maintenance and repair work. At the same time, they can guide the platform upgrade and upgrade process, ensuring the normal operation of the platform. In short, the development environment and technical specifications are very important for the development and maintenance of teaching platforms. They can guide developers to choose appropriate development environments and technical implementation methods, ensure the stability and security of the platform, improve development efficiency, and facilitate maintenance and upgrading.

3. Algorithm design

Big data resource scheduling refers to the effective management and scheduling of computing and storage resources in big data processing to efficiently complete data processing tasks. The following are several common methods for scheduling big data resources:

Centralized resource scheduling: In this method, all resource management and scheduling are centralized on a single master node, which is responsible for controlling the resource allocation and task scheduling of the entire cluster, and can also dynamically adjust according to needs.

Distributed resource scheduling: In this method, each node has its own resource manager and scheduling system, which can interact through communication protocols to achieve task allocation and resource management. The advantage of distributed resource scheduling is that it shares the pressure of a single node, making the system more robust and scalable.

Dynamic resource scheduling: By monitoring and analyzing existing resources in the system, dynamically scheduling and allocating resources to meet constantly changing data processing needs. This method can avoid task failures caused by excessive waste of resources and insufficient resources.

Adaptive resource scheduling: Adaptive resource scheduling is a feedback control based method that can automatically adjust resource allocation strategies based on the current system state and historical performance to achieve more efficient operation.

The above resource scheduling methods all have their applicable scenarios and advantages and disadvantages. This article selects the method of adaptive resource scheduling to improve data processing efficiency, reduce resource waste and cost expenditures.

A network teaching information fusion model based on the network course big data resource scheduling model is proposed, and the fuzzy membership function of information fusion under the open education system is obtained under the linear programming model as follows[8]:

$$P_F = \sum_{j=k}^{N} \sum_{\sum u_i = j} \prod_{i=1}^{N} \left(P_{fi}\right)^{u_i} \left(1 - P_{fi}\right)^{1-u_i} \tag{1}$$

$$P_D = \sum_{j=k}^{N} \sum_{\sum u_i = j} \prod_{i=1}^{N} \left(P_{di}\right)^{u_i} \left(1 - P_{di}\right)^{1-u_i} \tag{2}$$

Wherein, P_{fj} represents the fusion cluster center of big data distribution of college sports multimedia network teaching under the open education system, and P_{di} is the sampling frequency of network teaching under the open education system. The example set of data information flow of network teaching under the open education system is described as follows:

$$\overline{x} = \frac{1}{N} \sum_{i=1}^{N} |x_i| \tag{3}$$

In the data fusion center of platform, the attribute set of network teaching information data under the open education system is constructed, and the root mean square error of data classification is as follows:

$$\sigma^2 = \frac{1}{N} \sum_{i=1}^{N} |x_i - \overline{x}|^2 \tag{4}$$

In the attribute set distribution space of college sports multimedia network teaching information data under the open education system, the quantitative recursive analysis method is adopted, and the mining results of segmented fusion of college sports multimedia network teaching information under the open education system are as follows[9-10]:

$$x_i' = \frac{x_i}{\|x_i\|} = \left(\frac{x_{i1}}{\|x_{i1}\|}, \frac{x_{i2}}{\|x_{i2}\|}, \cdots, \frac{x_{iN}}{\|x_{iN}\|} \right) \tag{5}$$

Wherein, the dynamic copy value of information data under the open education system, in the distribution clustering space of parameters under the open education system, adopts the linear programming algorithm to cluster the static block data, and obtains the frequency division characteristic quantity of teaching data under the open education system as follows[11-12]:

$$X_p(u) = s_c(t) e^{j2\pi f_0 t} = \frac{1}{\sqrt{T}} rect\left(\frac{t}{T}\right) e^{j2\pi\left(f_0 t + Kt^2\right)/2} \tag{6}$$

Wherein, $s_c(t)$ represents the scalar time series in the data set under the open education system, $e^{j2\pi f_0 t}$ represents the feature matching set of information fusion under the open education system, f_0 is the main frequency feature component of data distribution, and T represents the sampling time delay of information under the open education system. Using quantitative recursive analysis method, the information fusion and scheduling under the open education system is carried out, and the output data set of the fusion scheduling under the open education system is obtained:

$$X = \{x_1, x_2, \cdots, x_n\} \subset R^2 \tag{7}$$

Wherein, under the open education system, the sample sequence of college physical education multimedia network teaching data sampling is x_i, $i = 1, 2, \cdots, n$, which means that the output data set contains samples.

4. Software development and implementation

In the process of physical education, multimedia technology can be used to make teaching courseware. CAI is characterized by synthesizing various media materials, combining words, images,

animations, sounds, etc., and increasing psychological feelings through the stimulation, thus improving teaching efficiency and teaching quality. CAI courseware is suitable for individualized teaching, emphasizing the leading role of students, so that students are no longer limited by time and place in their study. Therefore, its application is ideal. Under the linear programming model, the quantitative recursive analysis method is used to design the information fusion and scheduling algorithm .Quantitative recursive analysis is a method used to analyze the performance of computer programs. It is usually used in algorithm analysis and program optimization to provide a basis for writing efficient and fast computer programs. Quantitative recursive analysis mainly analyzes the complexity of a program through recursive trees or recursive relationships.Recursive tree is a method of visualizing recursive algorithms, which presents the execution process of recursive algorithms in the form of a tree. Each node in the recursive tree represents a subproblem in the recursive algorithm, and each layer of the tree represents the depth of recursion. By calculating the sum of the costs of all nodes on each layer, the time complexity of the entire recursive algorithm can be obtained.Recursive relationship is a mathematical formula used to solve recursive relationships. By formalizing the execution time of recursive algorithms, the time complexity of the algorithm can be calculated more accurately. Recursive relationships typically consist of three parts: recursive terms, initial values, and boundary conditions. Among them, the recurrence term refers to the law or algorithm, the initial value refers to the initial value or initial state in the recurrence relationship, and the boundary condition is the limiting condition for the recurrence term and initial value.

The software development and design of college sports multimedia network teaching platform under the open education system is carried out. The software platform includes database module, multimedia information resource sampling module, embedded program processing model, instruction dynamic loading module and multimedia man-machine interaction control module. They are described as follows:

4.1. Database module

In the embedded Linux system, Excel and Access technologies are used to construct the multimedia network teaching database module under the open education system. Embedded Linux is loaded by the bootstrap program to access and schedule the database, develop the Linux device driver, and execute "Make megtyfig" to complete the initialization configuration and initialization program.

The system is designed to allow both teachers and students to access the multimedia network teaching platform through their respective browsers. Students connect to the server using their personal computers and browsers to access physical education teaching content, inquire about resources, communicate with teachers, upload personal data, and perform other related tasks. College physical education teachers can update and maintain content on the server easily using a browser, uploading the latest resources for students to access and providing online guidance.

The server consists of a Web server and a database server. The Web server hosts the application modules and processes client requests by converting them into database queries, which are then handled by the database server. After processing, the server sends the results back to the Web server, which then presents them as web pages to the user. The database server stores and manages the database, handling queries forwarded from the Web server.

To facilitate ASP.NET connection, the database in this system is designed using Microsoft's SQL Server 2012, and the driver is built using VXI bus technology. The database interface is designed using the VISA software interface within the open education system. In the Web programming environment, ADO.NET is used to manage database operations such as inquiries, updates, additions, deletions, and checks, cooperating with SQL statements.

Data communication is established using TCP/IP (Transmission Control Protocol/Internet Protocol) between the DataSet and the multimedia network teaching data source of college physical education. The data source is written into the DataSet of the multimedia network teaching platform.

The client then receives packets from the server based on the data binding source in the DataSet. At the data receiving end, UDP places each message segment in the queue and periodically sends database access instructions to the sender.

This system architecture ensures efficient communication between the client and the server, supporting the effective operation of the multimedia network teaching platform for college physical education.

4.2. Multimedia information resource sampling module and embedded program processing model

In the design of the transmission control protocol, security mechanisms such as data encryption and identity authentication are also adopted to ensure the security and reliability of multimedia network teaching management information resources. These security mechanisms can prevent malicious attacks, data tampering, and information leakage on the transmitted data, ensuring the integrity and confidentiality of multimedia network teaching management information resources.

In the design of SIPURI, support for social learning and open learning resources was also considered, enabling multimedia network teaching management information resources to meet the personalized and customized needs of different subject areas and knowledge levels. For example, by intelligently recommending learning resources based on different users' learning habits and interests, it can improve users' learning interests and efficiency, and promote the sharing and communication of learning resources.

The intelligent management of multimedia network teaching management information resources can also help teachers and students better communicate and interact, improve teaching effectiveness and learning quality. For example, using intelligent speech recognition and machine translation technology can realize online voice communication and cross language communication, providing users with a more convenient and free learning experience. At the same time, through various data analysis and evaluation techniques, comprehensive monitoring and evaluation of students' learning processes and outcomes can be achieved, providing precise learning feedback and guidance for teachers and students, and improving the efficiency and success rate of teaching management[13].

4.3. Instruction dynamic loading module

The embedded web service design design method can realize online browsing and downloading of course resources, online submission and correction of student assignments, online testing and examination, etc. These functions can improve teaching efficiency and course quality, and provide students with more convenient learning methods.

Under the open education system, process management can also realize the functions of task allocation, progress management, quality control, etc., providing comprehensive support for teaching management. At the same time, through database access and management, teaching resources can be stored and managed, including course materials, student information, etc. In addition, the open education system can also achieve the management and playback of multimedia resources, providing a more vivid and intuitive display method for teaching.

Building an ROMFS file system on a physical storage medium allows for the packaging of device drivers and applications together, and program loading can be achieved through root file system loading. This method simplifies the process of program loading, accelerates system startup speed, and can improve system reliability and stability. At the same time, socket programming can achieve communication between web services and applications, facilitating the sharing and management of teaching resources[14-16].

4.4. Multimedia man-machine interaction control module

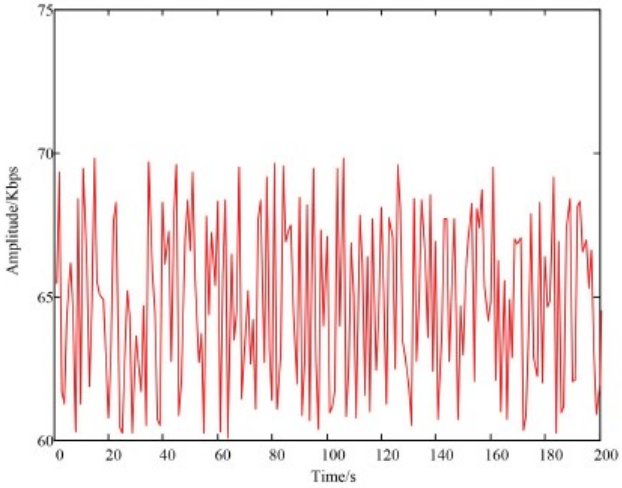
The multimedia human-computer interaction control module is a hardware or software component used to control multimedia devices. It typically includes input and output interfaces for interacting

with users, as well as components such as processors and memory for executing control tasks and storing related configuration data. In multimedia applications, human-computer interaction control modules provide diverse control methods to meet the different needs of users for multimedia devices. For example, in devices such as televisions, DVD players, and audio systems, control can be achieved through remote controls, buttons, and knobs; In devices such as smartphones, tablets, and computers, control can be achieved through touch screens, mice, and keyboards. In addition, more intelligent control can be achieved through voice recognition, gesture recognition, face recognition and other methods. The multimedia human-computer interaction control module can also achieve the management and playback control of multimedia resources. For example, in a music player, functions such as song selection, pause, playback, and stop can be achieved through a human-computer interaction control module; In the video player, functions such as video selection, fast forward, fast rewind, and full screen can be achieved through the human-computer interaction control module. In summary, the multimedia human-machine interaction control module is an important component used to control multimedia devices and resources. It can provide various interaction methods and functions to meet user needs and improve user experience.

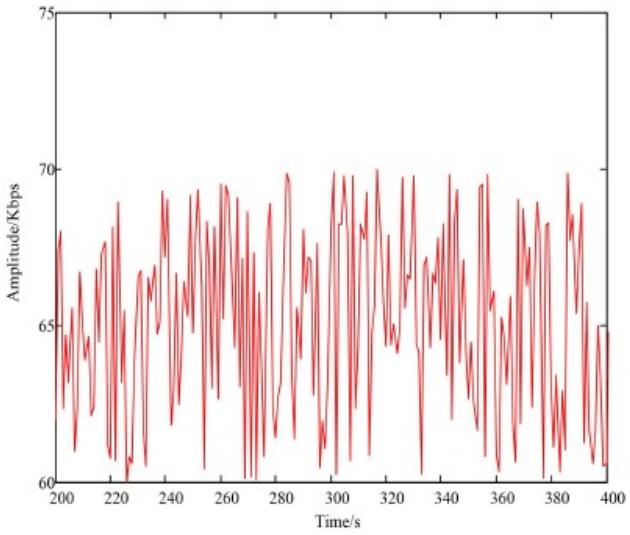
The multimedia man-machine interaction control module completes the man-machine interaction function of data transmission, builds the GUI of the multimedia man-machine interaction control module with Linux kernel[17-18], adopts I/O operation mode for driver development, automatically configures and initializes device parameters in the GUI man-machine interface[19-21], applies for necessary memory and interrupt for the driver . The device driver is defined as the function unregrser_chrdefev (), which sets the output mode of GPIO and multimode output mode, and sets the PWM related buffer. Under the cloud computing environment, the cross-compilation and multi-mode control of college sports multimedia network teaching information under the open education system is realized, and thus the opening and closing is completed through Open and ioctl.

5. System test analysis

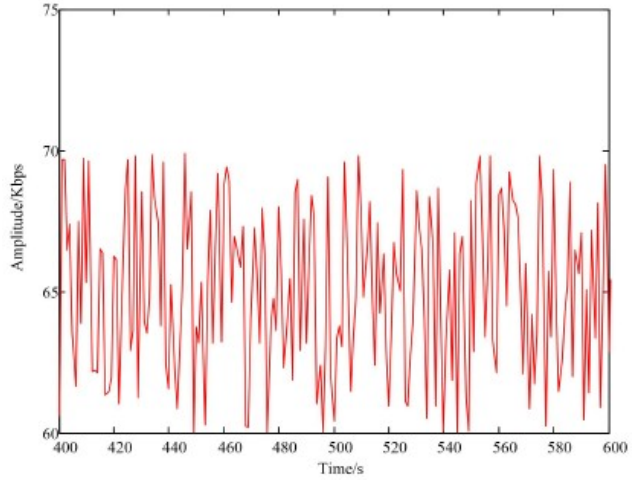
The joint debugging test of under open education system is established in IIC bus environment. Embedded ARM core processing program is used to compile and integrate the data. IIC bus uses hardware to set the device address. After the initialization operation is completed, Call IRcvStr () function to package the program driver and interface function, load the information fusion program in Linux kernel, and send CMD command on CMD line to realize database access and information resource scheduling. The set length of characteristic sampling is 1000, The time interval of resource scheduling is 0.25 s, and the maximum iteration number of data fusion in the linear programming model is. According to the above simulation environment and parameter settings, the performance test is conducted, and the results resource fusion are shown in Figure 3.



(a)Test sample 1



(b)Test sample 2



(c)Test sample 3

Fig. 3. Results of the integration

In order to verify the effect of the platform designed in this paper, compare it with the sports training platform based on virtual simulation and the sports teaching platform based on Web Technology (the platform in literature [22] and literature [23]), and test the accuracy of the college sports multi-media network teaching platform under the open education system constructed by different methods. The comparison results are shown in Figure 4.

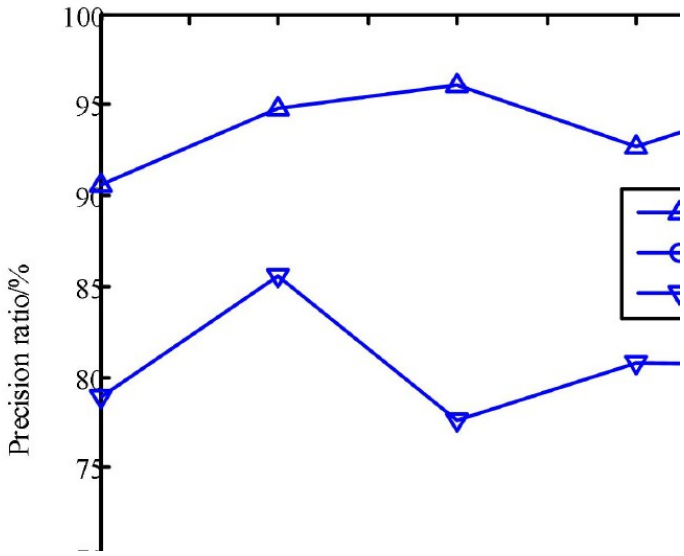


Fig. 4. Comparison of precision rate

Analysis of the results in Figure 4 shows that using this method to design the multimedia network teaching platform of college physical education under the open education system has a high precision rate of information, thus improving the data scheduling performance.

6. Conclusions

To enhance the efficiency of multimedia network teaching in college physical education, a software is developed for the college physical education multimedia network teaching platform in an embedded Linux environment. The platform comprises several key modules, including the database module and the multimedia information resource sampling module.embedded program processing module, instruction dynamic loading module and multimedia man-machine interaction control module. Excel and Access technologies are used to realize the data collection and database construction of college sports multimedia network teaching information under the open education system. Under the linear programming model, quantitative recursive analysis method is used to design the information fusion and scheduling algorithm of college sports multimedia network teaching under the open education system. The information fusion and scheduling algorithm is loaded into the system control terminal and information processing center through the instruction dynamic loading module. Under the cloud computing environment, the cross-compilation and multi-mode control of college physical education multimedia network teaching information under the open education system are realized, and the software development of the management platform is realized by combining the embedded software design method. The test results show that using this platform to manage college sports multimedia network teaching information under the open education system has good multi-mode integration and scheduling ability, strong real-time retrieval and access ability to information under the open education system, and good ability under the open education system.

Acknowledgements

1. Yan 'an University doctoral research project "Research on Traditional Ethnic Sports in Northern Shaanxi" project number: YDBK2024-05

2. Study on the inheritance path and mechanism of the excellent traditional culture of Shaan-Gansu-Ningxia Border region into college physical Education curriculum 23BY152 Shaanxi Provincial Education Department Project

3. Research on Yangko and Rural Tourism Economy Optimization and Upgrading Strategy under the 14th Five-Year Plan 2023-CXY-84-1 Yulin Science and Technology Bureau

4. Scientific Research Plan Project of Shaanxi Provincial Department of Education, Project title: Feasibility Analysis of Constructing a public service system for National Fitness in Northern Shaanxi Yangko, project number:126

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