

Research Article

Construction and Application of University Education Management Model Based on Intelligent Programming Analysis Method

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The intelligent programming analysis system based on Internet has attracted more and more attention in the field of education management. The problem of how to flexibly master the application capabilities of intelligent programming and development tools, debugging and optimizing programs, and project deployment is becoming more and more serious. Based on the intelligent programming analysis method, this paper systematically introduces the research and design process of education management model and designs modules such as distributed parallel PhpDig, information analyzer, and information resource database. The system adopts client/middleware/server (C/M/S) three-tier architecture planning and design. The server-side carries the resource manager, the middleware carries the intelligent work tasks (information analyzer, resource collection agent), and the client implements user interaction and data representation solves the storage load problem of a large amount of data. The experimental results show that the semantic processing of search object attributes can improve the retrieval performance, and the retrieval rate and tolerance factor reach 87.6% and 0.041, respectively, which effectively promotes the integration of the analysis data on the chain level and the education system.

1. Introduction

The Internet-based education management system can provide students with an education management environment that is not constrained by time and space and can communicate with teachers and classmates at any time; with the intelligence of the education management system, students can accurately and efficiently conduct human-computer interaction, targeted education management and training, thus effectively improving the efficiency of education management [1]. The programming language course has many knowledge points, and the knowledge points are relatively abstract in understanding. To better grasp the programming language, a lot of programming connections are needed. In view of the particularity of programming language education management, this paper designs a programming intelligent education management platform

based on SSH framework [2–5]. However, if the user data are collected purposefully through the education management system, even without increasing the burden on teachers and students, some data collection functions are added, and then the data collected by the system are sampled, analyzed, and processed. These data can well reflect the completeness of the knowledge structure of individual students and groups of students. The application of user data is of great significance to the educational management activities of colleges and universities, but it is also a function that the current educational management system lacks [6–8]. The system adopts B/S mode to provide students with a programming language education management environment, a test question practice environment, and a programming practice environment.

The current programming courses in colleges and universities tend to focus on the teaching of programming

language grammar in educational management, lacking actual programming training. Although the school has also added some computer courses for this purpose, it is difficult to cultivate students' programming ability with a small number of computer courses [9–11]. However, these abilities are exactly what students will need for further study and practical project development in the computer field in the future. In the language programming course, students need to go through a lot of programming exercises to deeply understand programming knowledge points and object-oriented programming ideas. The system provides students with an online programming practice environment for programming, an online programming editing environment, and functions for compiling error detection and logic error detection, and it can provide guidance education management content for students according to their specific education management situation. However, if the user data are collected purposefully through the education management system, even without increasing the burden on teachers and students, some data collection functions are added, and then the data collected by the system are sampled, analyzed, and processed. These data can well reflect the completeness of the knowledge structure of individual students and groups of students and can provide data guidance for teachers' educational management and students' educational management process [12–15]. The application of user data is of great significance to the educational management activities of colleges and universities, but it is also a function that the current educational management system lacks.

Aiming at some defects of the existing training and testing platform, combined with the actual educational management situation and needs of the communication electronic circuit course, an online homework and examination system is designed and implemented. Students can use this platform to conduct online training on the content of each chapter of the communication circuit and generate chapter assignments according to the teacher's requirements. The system includes seven modules including login and logout, online training, question bank management, homework management, test paper generation, and score query. On the basis of determining the module requirements, the paper expounds its design and implementation methods in detail and researches on the paper-making algorithm. Distance education refers to the comprehensive application of technology in a certain social period by a specific educational organization, collecting, distributing, designing, producing, and utilizing various educational resources, constructing an educational environment, and based on the technology, educational resources, and education of a certain social period. The environment provides educational activities for students. In all activities, teachers maintain a quasipermanent separation of students in the form of pontifical resources or as educational management helpers: students and educational groups (institutions) or students and students. The session will be maintained by establishing a two-way or multiway communication mechanism. The paper also introduces the information encapsulation processing model of SISDER search system

and describes the XML information encapsulation process and PhpOig's multithreaded PHP programming. PhpDig is a distributed parallel search system, which plays a decisive role in the timely update of data sources and information of the entire StSIER system.

2. Related Work

At present, the centralized online education platform has problems such as tampering with data and information opacity. This paper uses the advantages of intelligent programming nodes to solve the problem of centralized management range and redesigns smart contracts and data storage methods to ensure the availability of the system. On the education platform to achieve decentralized applications, after researching the technical level of the existing intelligent programming nodes, and proposing the technical drawbacks of the current intelligent programming nodes, the data structure of the intelligent programming nodes is improved, and the account-based data storage method is realized, which reduces the search time complexity to $O(\log N)$, which improves the data query speed and makes the application further meet the actual needs of the education system. In order to save a large amount of data information, especially analysis data, into the intelligent programming node, the literature redesigned the data structure of the block, solved the size limitation of the traditional block storage, realized the account-based storage method, and improved the data query efficiency. In terms of system business logic, solidity language is used to write Ethereum smart contract code to complete the core functions of the system [16].

Mora et al. [17] designed an improved MPT structure, which inherits the advantages of Merkle tree. It calculates the hash value layer by layer from the leaf node to the root node of the tree. The leaf node acts as an account and updates the data of each analysis generated under the account in real time. The latest hash is merged upwards and finally the entire MPT tree root is obtained, which is used to detect the consistency of the entire network data. When a new node is added to the system, MPT inserts a new account at the branch node according to the address and at the same time updates the hash list at the value of the branch node and finally generates a new MPT tree root according to the hash method of the Merkle tree and marks it with tamper-proof timestamps which are saved to the new block. Kovacova et al. [18] believe that whenever a new node is added or analyzed and generated, the latest block in the chain saves all the analysis in the current system, so that the MPT structure based on the account mode is compared with the previous cycle traceability query of intelligent programming nodes. The literature review is further subdivided into literature analysis and organization of related concepts such as STEM, STEAM education concepts, artificial intelligence, artificial intelligence education, and education management design. Theoretical research has done related educational management and application of constructivism and project-based educational management (PBL) mainly through the literature research method. The construction of the

education management design framework starts with sorting out foreign cases, specifying the design principles of education management goals, content design, education management strategies, and method design based on the STEAM education concept and integrating into STEAM education based on the original LID classic education management design model. Rikhardsson and Yigitbasioglu [19] constructed an artificial intelligence course education management design model. The educational management practice link is divided into three links: questionnaire survey, educational management interview, and teaching reflection. This part of the education management link mainly adopts the action research method, and the investigation part of the after-school education management effect adopts the investigation method.

Intelligent programming is a brand-new programming method. Programmers can use various controls or components provided by the software to construct various interfaces of the application in the form of building blocks. Yassine et al. [20] believe that, different from the complex and cumbersome programming language of traditional programming, intelligent programming is based on the principle of “what you see is what you get,” and the interface design can be completed only by dragging and dropping the intuitive operation method of combining various controls. First of all, from the literal meaning, intelligent programming is divided into subjects, which represent four independent disciplines of science, technology, engineering, and mathematics; secondly, it is integrated. That is, interdisciplinary and project-based education management (project-based learning, referred to as PBL); again, it is still extended and expanded. Intelligent programming is developed on the basis of high-level programming language. It allows programmers to use various controls provided by the software itself to construct application programs in an intelligent way like building blocks. In the process of education management, education managers are often very concerned about the design of the program interface. This is because the interface design is more intuitive, students are easy to interact with and the effect is obvious, and education managers have a sense of achievement and can stimulate and cultivate students’ interest. Li et al. [21] analyzed that the improvement of the MPT tree based on the account address uses the public prefix of the account address to reduce the query time of data records and minimize unnecessary string comparisons. When each account is used as an address to map to a leaf, a node is selected, the dictionary tree search method can be used as a reference model according to the addressing mode of the address in the MPT tree. The dictionary tree is used as a data structure to reduce the query time as much as possible by comparing common prefix strings. For example, the query string “abc,” obviously the strings starting with b, c, and d, and other subtitles are not considered, just look for the string starting with strings whose second letter is b which are considered until the end of the query [22–24].

3. Intelligent Programming Analysis Method Management Level

3.1. Intelligent Programming Language Nesting. Smart programming syntax requirements are relatively loose; for web designers, it can be operated more freely and conveniently, but for machines, the looser the syntax, the more difficult the processing, and the worse the compatibility with various browsers. XHTML uses XML grammar to standardize and rewrite HTML language, and the grammar requirements are stricter. So, XHTML is essentially a transitional technology, which combines some of the powerful functions of XML and inherits most of the simple features of HTML, showing good ease of use and compatibility.

$$\sum_{i=1}^n f(i, t) \times g(m, t) - \frac{n \times f(m, t)}{\sum_{i=1}^n f(i, t)} = 0. \quad (1)$$

It can control many properties that cannot be controlled only with HTML technology, such as precise control of the position and layout of web page objects to the pixel level, support for almost all font size styles, the ability to edit web page objects and model styles, and the ability to perform preliminary interactive design. CSS language can be regarded as a breakthrough in the field of WEB design. Through CSS technology, designers can control the style and layout of multiple pages at the same time. Website developers can define unique styles for each HTML element and apply them to as many pages as they want. If a page needs to be updated globally, simply change the cascading style sheet, and all elements in the website will be updated automatically.

$$\sum_{i=1}^n \frac{h(i, t)}{k(i, t)} - \sum_{i=1}^n \frac{h(i-1, t)}{k(i-1, t)} = 0. \quad (2)$$

With the powerful functions of CSS, not only can web designers fully release design inspiration and beautify web pages as ideally as possible, CSS can also simplify and optimize code according to the understanding ability and programming style of different designers, thereby reducing design difficulty and improving work efficiency. Each end El of the educational intelligent programming analysis controller realized by software simulation 2C bus can be connected to external switch sensors (such as photoelectric sensors, contact sensors, and Hall sensors), analog sensors (such as photosensitive sensors, infrared sensors, acoustic sensor, and grayscale sensor), bus sensor (such as ultrasonic sensor), wireless dental monitoring module, LED dot matrix screen, indicator light, and educational robot controller. It is especially pointed out that the educational intelligent programming analysis controllers can be directly interconnected to form an intelligent programming analysis network, which is especially suitable for occasions where multiple intelligent programming analysis needs to cooperate to complete tasks.

3.2. Analysis of Programming Requirements. In the development of the website, the programming requirement analysis technology can also cooperate with the Struts tag to

realize the design of the web page. The presentation layer in the programming intelligence-assisted education management system designed in this paper is based on the Struts2 framework. Struts2 provides a very rich label to help the design of the presentation layer. Many pages in this system use the labels provided by Struts2. When calling the Struts tag, it should be noted that when defining the presentation style in the tag body, you can no longer use the style keyword, but use the `cssStyle` keyword instead. The intelligent and interactive narrative e-book specially designed for programming language courses can realize the ideal knowledge point explanation process according to the teacher's understanding of the cognitive process of programming knowledge, combined with the possible deficiencies in the classroom education management process. In this way, not only can the knowledge explanation be reproduced, so that students can efficiently check and fill omissions, but also educational management resources that can expand students' knowledge and enhance students' practical ability can be flexibly added according to teachers' educational management needs and the actual educational management situation.

$$\frac{\sum_{i=1}^n h(i, t)/k(i, t)/g(m, t)}{n \times [h(m, t)/k(i, t)]} - \frac{h(m, t) - k(i, t)}{\sum_{i=1}^n h(i, t)/k(i, t)} = 0. \quad (3)$$

When determining the encoding scheme, we adopted the grouped natural number encoding strategy. Each set of codes reflects a question type, and each question type is encoded with natural numbers, that is, each question type selects the test questions from the initialized question type library according to the requirements of the test set to form a chromosome. Each selected question represents a chromosome code, which directly uses the number of the question. Chromosomes are processed by variable-length coding strategy, the number of codes in chromosomes is the number of test questions in the test paper, and the codes between question type groups are independent. Real number coding adopts the coding method of one parameter corresponding to one gene, which is the real value corresponding to the parameter.

However, its theoretical research is not yet mature, and the efficiency of genetic operators needs to be improved. The natural number encoding method takes the sequence number of the thing as the gene, which is more convenient when solving the ordered combination optimization problem in Table 1, and the calculation efficiency is high.

Resource pack contains manifest files and physical files. A package interchange file compresses a package into a single file (e.g., zip, jar, .cab) to facilitate network transmission of the package. A package represents a set of individually useable and reusable educational management content. A package may be part of a course, a courseware, or a collection of courses; it is a meaningful unit that can be used independently and can be combined or broken down into other packages. The content list contains metadata, which is an overall description of the content list and a description of the data attributes; organizational structure, which describes one or more organizational structures of the content in the content list; resource references, describe

TABLE 1: Sequence combination optimization description.

Research name	Type name	Operation value	Boolean value
SyntaxHighlighter 1	getRuntime0	0.86	1
Scripts.shCore 1	BufferedReader	0.75	0
Scripts.shCore 2	getRuntime0	-0.09	1
SyntaxHighlighter 2	BufferedReader	-0.49	0
Scripts.shCore 3	getRuntime0	-0.38	1
SyntaxHighlighter 3	BufferedReader	0.14	1
Scripts.shCore 3	BufferedReader	0.74	0

the metadata of the resource and references to any external files; and subcontent manifests, zero or more nested manifests. Physical file refers to media files, text files, assessment files, and other data in the form of files.

3.3. User Data Management. Through the education management of computer user data simulation method, this paper understands the cognitive process of people and then guides the design of media education management materials in the programming education management assistance system, assisting students to easily and efficiently complete the self-study process after class. The computer simulation method regards the human brain as an information processing system similar to a computer. Psychologists believe that the information processing system of the human brain is composed of receptors, effectors, memory, and processors (or control systems). Human cognitive process is as follows: first, its receptors receive environmental information (such as visual information and auditory information) and convert the information; the control system in Figure 1 reconstructs, distinguishes, and compares the converted information. The information then enters long-term memory; the reactor is responsible for giving information back to the outside world.

The architecture of the hibernate framework needs to pass the configuration file hibernate. The connection information between properties and the database also requires an XML mapping file to determine the direct correspondence between persistent classes and data tables and data columns. Hibernate's persistence solution releases users from the original JDBC access and does not need to pay attention to the underlying JDBC operations and directly operates the persistence layer in an object-oriented manner. Hibernate provides a "comprehensive solution" architecture solution, which abstracts the application layer from the underlying JDBC and JTA APIs, manages the underlying JDBC connection through configuration files, and realizes persistent access to data.

3.4. Web Design Implementation. The unique selector of web page design, well-encapsulated AJAX, chained DOM operation, and event binding mechanism have won the support and trust of many developers, standing out from a large number of programming technologies. The syntax design of

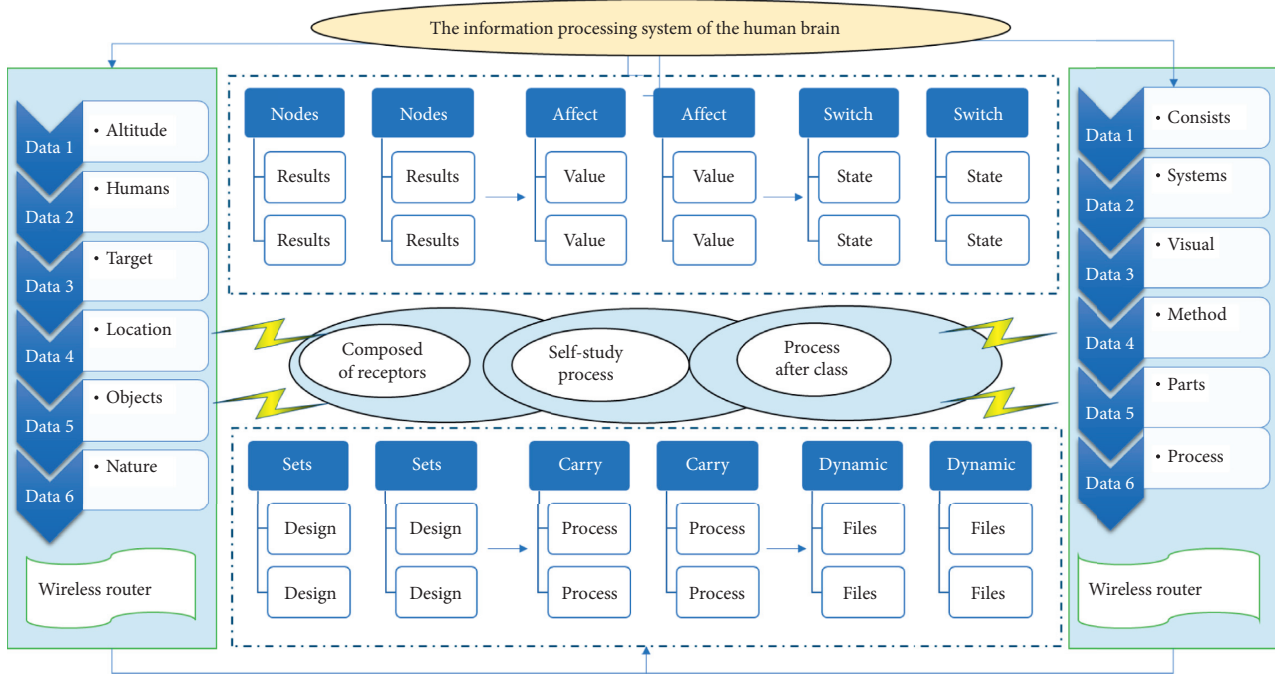


FIGURE 1: Programming education user data management framework.

iQuery technology can make developers more convenient, such as operating document objects, event processing, making animation effects, selecting DOM elements, using Ajax, and other functions. Its modular development method enables developers to easily develop powerful functions. Static or dynamic web pages.

$$L(m, t) = \frac{l(0, t)}{N} + \frac{l(1, t)}{N} + \frac{l(2, t)}{N} + \dots + \frac{l(m, t)}{N}, \quad \text{for } (m, t \in N). \tag{4}$$

iQuery technology provides several methods related to AJAX. Through jQuery AJAX methods, developers can use HTTP Get and HTTP Post to request text, HTML, XML, and JSON from remote servers and then load these server data directly into selected elements of the web page. The biggest advantage of using iQuery technology for web development is that it allows developers to write their own plug-ins according to their needs and provides an official plug-in: jQuery ui.

Pooling layers are placed between adjacent convolutional layers to compare data and reduce the amount of parameters, reducing the occurrence of overfitting. Developers can freely extend the jQuery function library or develop UI components according to their own project needs through the API provided by JQuery. There are already tens of thousands on the Internet, covering a variety of needs. Examples include XML tools, Ajax assistance, drag and drop, dynamic lists, cookie handling, pop-ups, and data tables. iQuery also provides very comprehensive and detailed documentation, which can greatly reduce the difficulty for developers to use.

The educational resource attribute set takes Figure 2 as the basic framework and provides classified attribute sets

according to the different characteristics of each type of resources. An important role of these attributes is to provide a basis for users to retrieve resources. Corresponding educational resource attributes to XML tags, and according to the technical specification of educational resource construction, an XML document with a good structure is written, and the content in the tags and tags can accurately express the information of a certain aspect of educational resources reflected by the attributes. Because the XML language has no dependence on the platform and is open on a global scale, the description of resources has a set of standards that can be in line with international standards and have a wide range of versatility. Because the attributes of resources themselves carry information about the content of the resources, users can use search tools to search educational resources according to their own needs by means of the dependencies. The XML document of educational resource annotation attribute can be used not only for text type resources but also to describe the content of multimedia resources by using the tags and the text between tags.

4. Construction of University Education Management Model Based on Intelligent Programming Analysis Method

4.1. *Intelligent Programming Analysis Command.* The educational resource attribute set takes programming analysis commands as the basic framework and provides classified attribute sets according to the different characteristics of each type of resources. An important role of these attributes is to provide a basis for users to retrieve resources. Corresponding educational resource attributes to XML tags, and according to the technical specification of educational

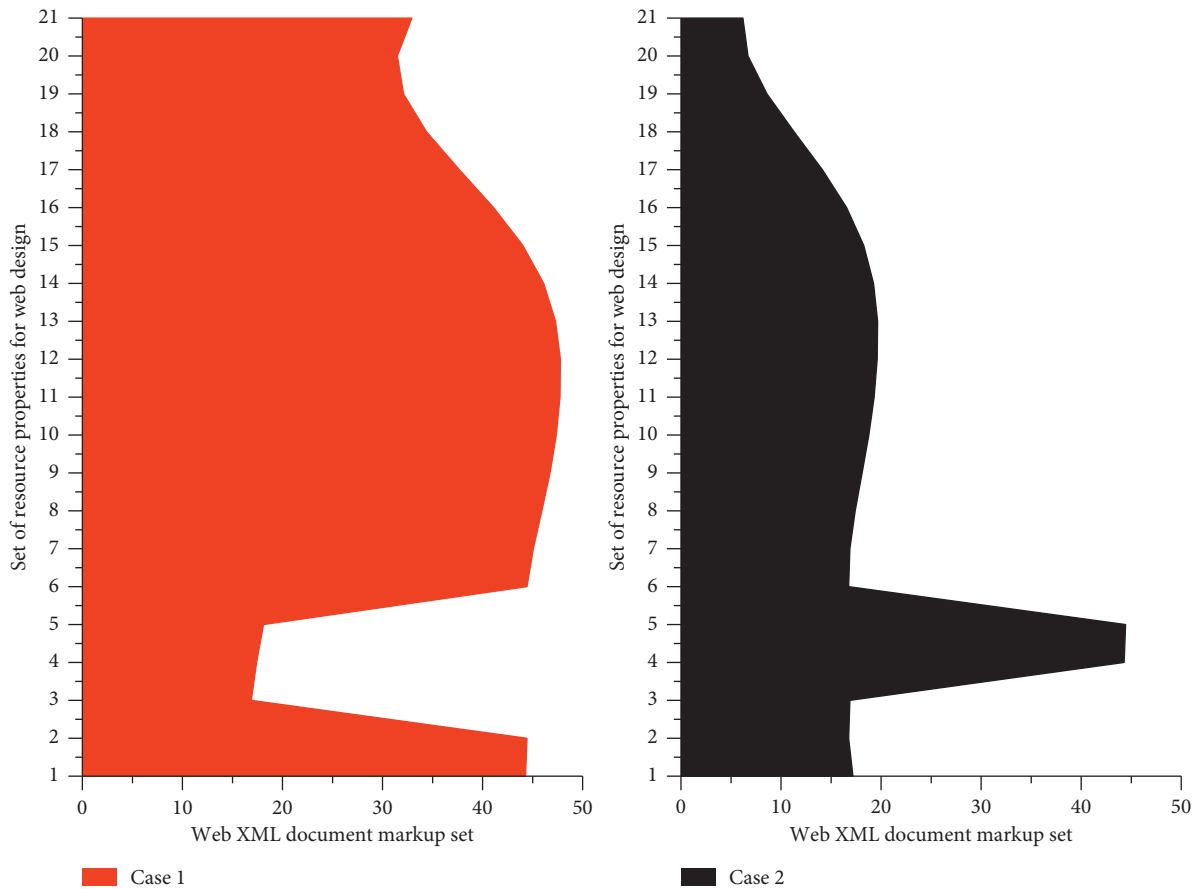


FIGURE 2: Distribution of web design resource attribute sets.

resource construction, an XML document with a good structure is written, and the content in the tags and tags can accurately express the information of a certain aspect of educational resources reflected by the attributes.

$$\left[\frac{l(m,t)}{N} \quad \frac{l(m-1,t)}{N} \quad \frac{l(m+1,t)}{N} \right] \times \begin{bmatrix} m \\ m-1 \\ m+1 \end{bmatrix} - \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix} = 0. \quad (5)$$

Because the XML language has no dependence on the platform and is open on a global scale, the description of resources has a set of standards that can be in line with international standards and have a wide range of versatility. Because the attributes of resources themselves carry information about the content of the resources, users can use search tools to search educational resources according to their own needs by means of the dependencies between tags and content in XML documents. The XML document of educational resource tagging attribute can not only be used for the text type resource in Figure 3 but also can use the tag and the text between tags to describe the content of the multimedia resource.

Now, there are various integrated environment installation packages on the Internet. This kind of installation package has been preliminarily configured, which saves the

trouble of installing software and configuration separately, saves time, and is easy to use. The development of this system uses the integrated environment of xampp. After the installation, it should be noted that the IIS service of the Windows operating system occupies ports 443 and 80 by default, so when using the integrated environment, modify the http.conf under apache. After installing the software, it is found that the browser cannot load the php file. This is mainly because apache cannot load the php file. That is to say, when the local ip address is entered in the address bar, the index.html is displayed, indicating that the server loads this file. We need to modify the configuration file to change the default display page to index.php.

4.2. Composition of Media Education Management Modules.

In the development of the media education management module, CSS technology can also cooperate with Struts tags to realize the design of web pages. The presentation layer in the programming intelligence-assisted education management system designed in this paper is based on the Struts2 framework. Struts2 provides a very rich label to help the design of the presentation layer. Many pages in this system use the labels provided by Struts2. When calling the Struts tag, it should be noted that when defining the presentation style in the tag body, you can no longer use the style keyword, but use the cssStyle keyword instead. Aiming at the

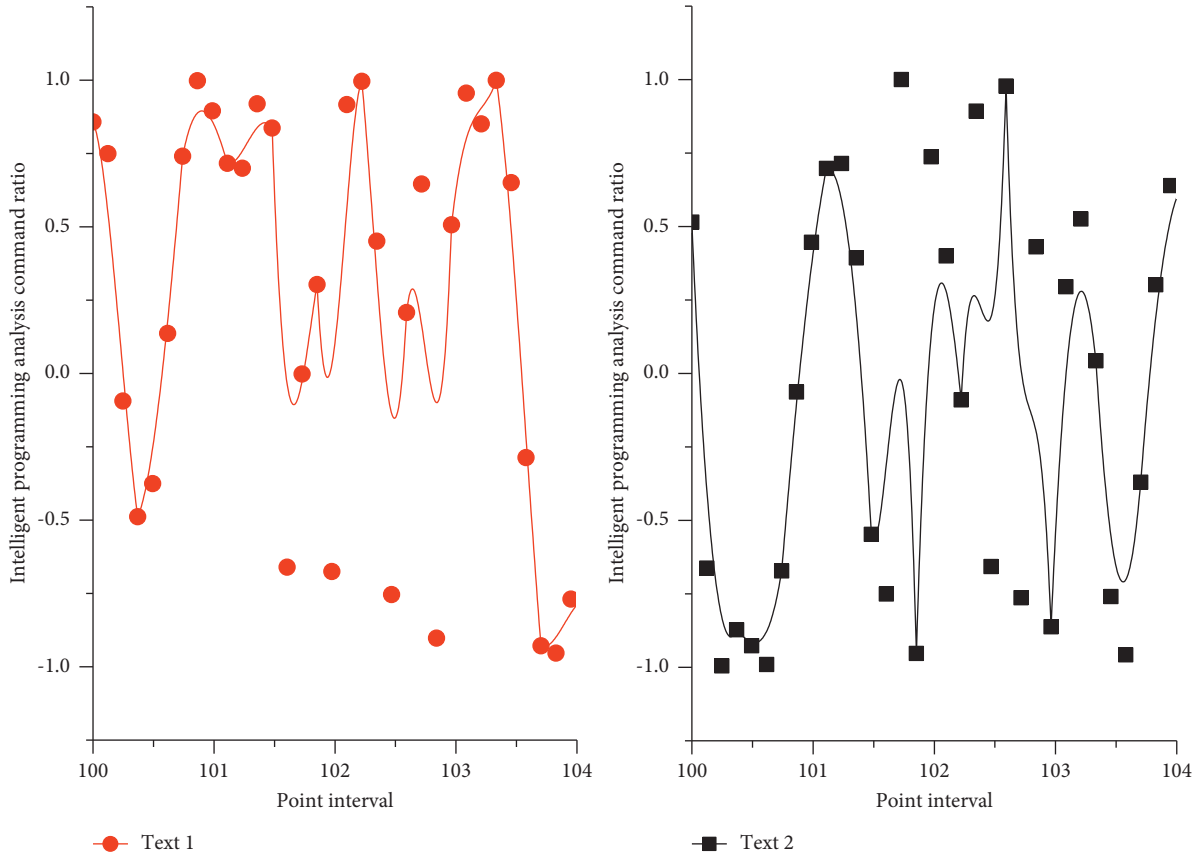


FIGURE 3: Intelligent programming analysis command configuration.

problem of repetition rate of test questions, the system adopts a shuffling algorithm. We prestore the required test questions from the database into the array and then call the shuffling algorithm to shuffle the order of the question numbers, so that even if the random number generated each time is the same, there is a high probability that the random number will be used as a subscript.

$$u(x, t) = \begin{cases} a(x, t) + b(x, t) + c(x, t), & x > t, \\ a(x, t) + a(x, t - 1) + a(x, t + 1), & x \leq t. \end{cases} \quad (6)$$

The values in the corresponding arrays are different. Using this algorithm can reduce the repetition rate of the test questions to a certain extent. At the same time, when generating the test papers for the final exam, the shuffling algorithm can also reorder the question number array of the same question type after all the questions are generated and combine them to generate several papers with the same questions but different orders. To prevent students who sit adjacent to each other from plagiarizing and cheating during the exam, it can avoid the trouble of teachers restricting candidates' seats in the current exam.

$$\lim_{x \rightarrow \infty} \frac{a(x, t) + b(x, t) + c(x, t)}{u(x, t)} - \lim_{x \rightarrow \infty} u(0, t) > 0. \quad (7)$$

The imported file needs to be edited in Word system and saved as RTF type or TXT type file. The graphics of the question content and answer content can be pasted into the

question content and answer content boxes, and the graphics can be saved as a BMP or JPO file and imported into it. After editing the test question content and answer content, click the "Save Test Question" button to save the test question. "Input Test Question" is used to clear the text area and graphic area of the test question content in the interface, which is convenient for inputting new question content. "Show Questions" is used to browse the editable attributes in Table 2, and you can select questions by inputting numbers or clicking the upper and lower buttons. The displayed questions can be directly modified and saved.

(1) Log in and log out of the system: the system is only open to students who choose this course. By verifying the student ID and password of the logged-in users, it gives legitimate users the right to log in and modify information. If the password is forgotten, it can be retrieved through the mailbox. (2) Users who have successfully logged in have the authority to practice independently, do online homework, view grades, and answer questions online, but users only have the authority to practice and homework themselves and cannot view or interfere with other people's homework. (3) The self-training module is used for students to carry out extracurricular education management training. Students can generate exercises according to their own wishes, and the system will randomly submit the exercise content for teachers to check the exercise effect and find out the problems in the students' training in time.

TABLE 2: Editable attribute distribution.

Text number	Assistance ratio	Test number	Assistance ratio	Case number	Assistance ratio
1	0.08	1	0.14	1	0.71
2	0.65	2	0.47	2	0.18
3	1.38	3	1.08	3	0.35
4	2.11	4	1.69	4	0.88

Taking the image input as an example, the pooling layer operates as a proportional compression of the image. It is worth noting that this process does not change the depth of the convolutional layer. If students practice frequently within a certain period of time, the probability of their training content being submitted will increase.

The educational resource packaging standard mainly includes the modules in Figure 4: Content Packaging Information Model Specification; Content Packaging XML Binding Specification [CELTS-9.2 (CD1.6)]; and Content Packaging Practice Guide [CELTS-9.3 (CD1.6)]. Packaging technical specification refers to a data structure that can be used to exchange educational management content, provides standard data binding for educational executives and educational management resource developers to produce educational management content, and is the data structure required for interoperability between educational management content as well as the standardized packaging of educational management content.

$$\begin{cases} \sum x_i \times w - \exp(x) \times b + 1, & y_i = 1, \\ \sum x_i \times w + \exp(x) \times b + 1, & y_i = -1. \end{cases} \quad (8)$$

According to the content packaging specification, different resources can be executed on different platforms and can also be reused in different production tools and can also be transmitted and exchanged as independent units. The content packaging specification makes educational management content an educational management component that can be exchanged and reused between multiple applications and educational management environments, which is beneficial to educational resource sharing and retrieval.

4.3. Update of Educational Management Model Factors.

The traditional information retrieval based on the education management model retrieves complicated Internet information by means of word string matching, which will lead to difficulties in information retrieval. The semantic-based information retrieval first maps the user's retrieval to the Internet, obtains relevant knowledge and associations from the Internet, and then conducts information retrieval to the Internet. It is a knowledge-based information retrieval process that enables users to locate faster, know more deeply, and learn more about what to retrieve. The following is an example based on semantic information retrieval.

$$\int \frac{-b + \sqrt{b^2 - 4ac}}{2ax} dx + \int \frac{-b - \sqrt{b^2 - 4ac}}{2ay} dy = 1. \quad (9)$$

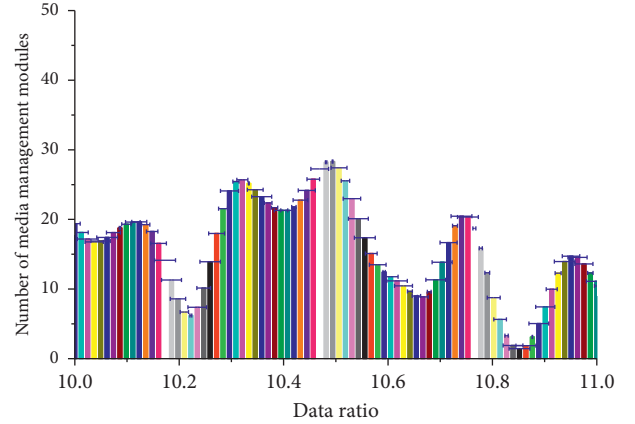


FIGURE 4: Distribution of media education management modules.

When the user's query is a "natural number," the semantic-based search tool will return the following information. The random extraction method is a commonly used algorithm in the test paper setting algorithm. It has two extraction methods: (1) use the generated random number to select the corresponding question number in the question bank, and judge whether the question meets the test paper parameters; (2) use constraints: one of the conditions is used as a prerequisite, and then the test questions that meet this condition are randomly selected to judge whether it meets other constraints, until a test question that meets the requirements is formed.

Therefore, a nonlinear function is introduced as the excitation function in the excitation layer to enhance the expressive ability of the multilayer neural network. The random algorithm is relatively simple, easy to understand and implement, and is suitable for small question banks. However, as the number of test questions increases, it will become more and more difficult to determine the range of test questions that can be selected to meet the requirements, resulting in a large number of invalid operations in Table 3 and greatly reducing the efficiency of test composition. With the success rate, it may lead to a higher repetition rate of the test questions.

In the homework subsystem, students input teachers to preset homework generation parameters for homework generation. For example, set the assignment parameters as follows: Chapter 3 of the assignment chapter, 3 multiple-choice questions, 4 fill-in-the-blank questions, 2 short answer questions, and 3 calculation questions, as shown in the text. After setting the parameters, the generated homework test number is as shown in the text. It can be seen that the difficulty of the generated homework is between 0.4 and 0.7,

TABLE 3: Intelligent programming analysis constraint parameter codes.

Index	Script content	Code text
1	The conditions are used as exp g_i	Set local enable delayed expansion
2	It meets other constraints $\max(d)$	For /l %%i in (0) do (
3	With the success rate $H(ide)$	Set "line=" </style>
4	The $P(\text{reader})$ random extraction method	For /l %%j in (1, 1, 80) do (
5	Greatly reducing the $T(x_n) - T(x_2)$	Set /a down%%j- = 2
6	This condition is random	Set "x = !Down%%j!"
7	A higher repetition $f(v, d)$ rate	If !X! LSS 0 (
8	Efficiency $L(y, g)$ of test composition	Set /a Arrow%%j = !Random!%%3
9	Easy to understand and implement $y_2^3 - y_3^3$	Set /a Down%%j = !Random!%%15 + 10
10	The multiple-choice $\cos \theta$ questions	Overflow: hidden;}
11	That can be selected to $\sin \theta$	Set "x = !Arrow%%j!"
12	In the $Q(\text{on})$ homework subsystem	If "X!" == "2" (
13	The requirements are more precise	Set "line = !Line!!Random:~-1!"
14	The difficulty of the generated $\beta * Q(\text{on})$) else (set "line = !Line!")
15	After obtaining $d(k, x_2)$	<canvas id = "canvas"></canvas>
16	All the $dsdud\theta$ question numbers	<style type = "text/css">
17	Generated homework test number	Body{margin: 0; padding: 0;
18	Multiple-choice $H(\text{reader})$ questions	Canvas.height = window.innerHeight

and the number of test questions also meets the requirements. After obtaining all the question numbers of the multiple-choice questions, according to different situations, the homework adopts the formula to calculate the difficulty coefficient, because the homework does not need to precisely control the difficulty, as long as the difficulty coefficient is maintained between 0.4 and 0.7.

$$u(P) - [u(x_1), u(x_2), u(x_3), \dots, u(x_{n-1}), u(x_n)] = 0. \quad (10)$$

If the absolute value of the difference between the difficulty coefficient and the difficulty threshold is within 0.025, it will jump to the step; otherwise, the difficulty will be balanced. If the difficulty factor is lower (higher) than the difficulty threshold, select a question whose difficulty factor is higher (lower) than the difficulty threshold from the $tihao\text{list}_i$ array of the same knowledge point and go to the step to reevaluate the difficulty until the difficulty meets the user's requirements, and the question is stored in the exam array and jumps to the step. If the difficulty is equalized for 4 times and still cannot meet the requirements, jump to it.

$$\lim_{x \rightarrow \infty} \frac{u(x, t) \times n!}{r!(n-r)!} = \begin{cases} u(0, t), & x > t, \\ [u(0, t) + u(1, t) + u(2, t) + \dots + u(n, t)] \times \frac{n!}{r!(n-r)!}, & x < t. \end{cases} \quad (11)$$

The advanced three-tier technology adopted is based on the overall framework of the three-tier client/middleware/server (C/M/S) architecture; distributed computing system, making full use of computing resources (CORBA); based on browser/server (B/S) mode of navigation query, easy to use; component-based software development mode to ensure software reusability; object-oriented rapid application development tools; software development process based on software engineering; large-scale software with advanced

5. Application and Analysis of University Education Management Model Based on Intelligent Programming Analysis Method

5.1. Intelligent Programming Analysis Data Rectification. Programming analysis is widely used in server-side and browser-side program development and is a prototype-based, dynamic, weakly typed literal scripting language. The interpreter for programming script is called the programming script engine, which is an important part of the browser. Usually programming scripts are embedded in HTML to achieve their own functions, mainly used to add interactive behavior to HTML pages. Programming script is often used to add various dynamic functions to web pages and provide users with smooth and beautiful page display. Like other computer languages, programming script language has its own basic data types, expressions, operators, and basic program framework. Programming scripts provide four basic data types and two special data types for processing data and text.

technology and complete functions database management system; and building-block system structure is based on business process model, which supports the user's optionality of each module. The core of the three-tier client/server model is to divide the business logic, presentation logic, and data of Figure 5 into three distinct processing layers.

The process for the host to receive a data is as follows: the host first starts the 12C bus, then sends the address to be addressed, stops the 12C bus after receiving the response

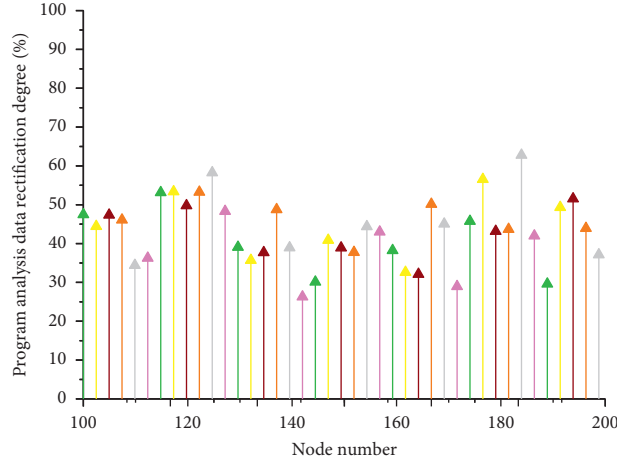


FIGURE 5: Programming analysis data rectification.

signal sent by the slave device, then restarts the 12C bus, and sends the data to be read. When receiving the reply signal sent by the slave device, the host starts to receive data and then sends a reply signal to the slave device to notify the slave device that the data have been received, and then the Earth machine releases the 12C bus. Different types of external devices have different initialization requirements for ports,

some require the port to be in output mode, and some require it to be in input mode. Therefore, when it is out of sequence, it needs to be in accordance with the selected device. In the programming software world, the function of each port of the controller is configured to realize the versatility of the port.

$$\text{if } \begin{cases} n, r \in C(1, 1) \\ r > 1 \end{cases}, \quad \iint \frac{n!}{r!(n-r)!} dndr = \frac{0!}{r!(n-r)!} + \frac{1!}{r!(n-r)!} + \frac{2!}{r!(n-r)!} + \cdots + \frac{r!}{r!(n-r)!} \quad (12)$$

The presentation logic (client layer) is the first layer. Its main function is to realize user interaction and data representation, collect data for subsequent processing, request the second layer of business logic to call core service processing, and display the processing results. The business logic (server component) is the middle tier. These components are managed by middleware, implement core business logic services and broadcast these services by name, manage and

accept customer service requests, submit data operations to the resource manager, and return the processing results to the requester, the client, or other servers. Data (resource managers) form the third layer of the model. For example, a relational database is responsible for managing the data resources of the application system and completing data operations.

$$\sum f(i-1, j-1) - \sum g(i-1, j-1) = \sum_m \sum_n w(m, n) \times x(i+m, j+n). \quad (13)$$

In the process of completing the service, the server component accesses the data it manages through the resource manager or knows the data service of the resource manager. Although the genetic algorithm takes much more time than the improved random algorithm under the same test-setting conditions, the success rate of its test composition is greatly improved, especially when the number of questions becomes larger and the number of questions increases, it is still able to maintain a high success rate; for system applications, it is worth sacrificing time to improve the success rate. At the same time, the genetic algorithm can also cover the second-level knowledge points well and can

play a more active role in the intelligent guidance of the examination system.

5.2. Simulation Realization of University Education Management Model. In practical education management projects, teachers often use two programming training methods: writing complete programs and completing program functions. Writing a complete program is usually to exercise students' programming practice ability, and completing program functions is often to enable students to deepen their understanding of some knowledge points through

programming exercises. Therefore, the system needs to design and implement the programming training environment of the above two methods according to the actual educational management needs. In the application of programming training module, it is necessary to provide users with good editing functions and perfect compilation

detection and logic detection functions. Among them, compilation detection means that the system compiles the source code to detect whether it has syntax errors; logic detection is to check whether the running result of the program written by the user is correct through use case testing.

$$\psi(x|1, 2, 3, \dots, n) \stackrel{\sqrt{a^2 + b^2} > 1}{\leftrightarrow} \psi \left[\frac{f(x, d) - f(x, m)}{f(x, d) + f(m, d)} \right] + \psi \left[\frac{f(x, d) + f(x, m)}{f(x, d) - f(m, d)} \right]. \quad (14)$$

The degree of discrimination is used to identify the abilities of test takers at different levels, and to a certain extent, it can also reflect the attitudes of students in education management. The degree of discrimination is the difference between the average score of answering the question and the unanswered question, which accounts for the proportion of the full score of the question. It can be seen from the formula that the value range of the discrimination degree of the test question is $(-1, 1)$. If the discrimination degree is too low, it means that the test paper cannot accurately test and evaluate the students' ability. On the contrary, the highly discriminative test questions can help identify the abilities of different students, so that the abilities are proportional to the scores and provide guidance for teachers to implement targeted education management. The difficulty and discrimination of the test questions are two criteria for evaluating the quality of the test questions, and the two will affect each other. When the difficulty of the test questions is too high or too low, it will lead to a low degree of

discrimination in Figure 6, and it is impossible to distinguish the educational management of students.

In order to facilitate students to explain the programming language in comparison with education management and teachers, the bidirectional real-time conversion between flow chart and C-like language is designed and implemented, which has become an important feature of the programming platform. That is, the relationship between output and input is no longer a simple linear relationship, but can approximate any function.

The detailed design of the embedded control platform based on Atmega16 microcontroller is given. Among them, the software simulation 12C bus method is used to realize the multifunction port, which can easily connect a variety of peripheral devices and improve the scalability of the control system; the underlying driver library functions are designed and implemented, and the user can directly pass the program design.

$$\left\langle \sqrt{\frac{f(x, d) - f(x, m)}{x + d}} \middle| \cos x \right\rangle \stackrel{\sin x + \cos x = 1}{\Leftrightarrow} \left\langle \sqrt{\frac{f(x, d) + f(x, m)}{x - d}} \middle| \cos m \right\rangle. \quad (15)$$

When the difficulty of the test question is too low, that is, the test question is too simple, almost all students can answer it correctly; when the difficulty of the test question is too high, it means that only a small number of students can answer it correctly; in these two cases, the degree of distinction is not displayed. From the calculation of difficulty and discrimination, it can be seen that the difficulty and discrimination of the test questions depend on the students' answers and the score configuration of the test papers. At the same time, considering that the students' ability levels are basically in a normal distribution trend, the actual paper is issued according to it. The normal probability distribution idea is used to measure and continuously adjust.

review, and examination. Therefore, the system designed in this paper not only needs to integrate the test question training environment but also needs to design different functions according to different educational management scenarios. The first step, after traversing the database according to the conditions, gets the title numbers 3-7 and stores them in the array; the second step randomly generates a number in the range of $(0, 4)$ as the subscript of the array, generates the subscript 1 of the array, and selects it.

$$\begin{cases} f(i, j) - [(f_i(i, j))^2 + (f_i(i, j))^2]^{1/2} = 0, \\ g(i, j) - [(g_i(i, j))^2 - (g_i(i, j))^2]^{1/2} = 0. \end{cases} \quad (16)$$

5.3. Example Application and Analysis. In the practice of test questions, due to the lack of the assistance of the information system, teachers have problems of low execution efficiency, unsatisfactory effect, and heavy workload in education management work such as homework release, homework

Corresponding question number 4, after the question number, is stored in the question number array, covers the selected array element 4 with the last valid question number 7 in the array, and reduces the range of random numbers by the third step, and repeats the second step until the number of questions generated meets the requirements. The

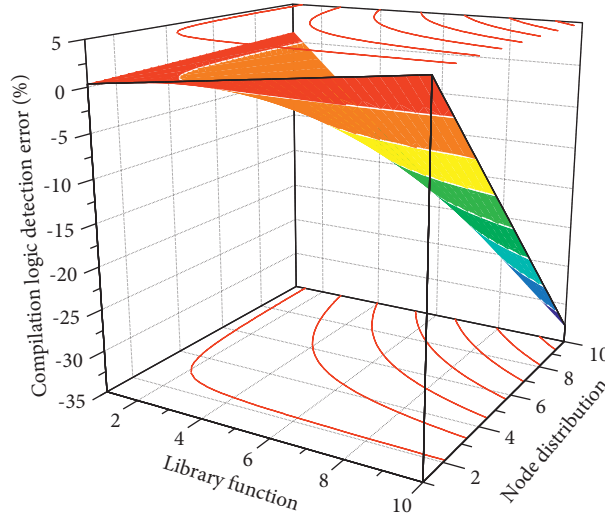


FIGURE 6: Compile logic detection library function distribution.

advantage of this algorithm is that it does not require repeated judgments and does not perform a large number of moving operations due to deletion of array elements, but only performs assignment operations on array elements, reducing the complexity of the algorithm to $O(n)$.

$$T(x) = \begin{cases} t(x) \times [0, x, 1], & x \in X, \\ t(x) \times [x, 1, 0], & x \in Y, \\ t(x) \times [1, 0, x], & x \in Z. \end{cases} \quad (17)$$

According to the given experimental results, it can be seen that compared with the traditional random algorithm, the improved random grouping algorithm has a higher success rate, and the time-consuming is shorter. Comparing Experiment 1, Experiment 2, and Experiment 3, under the condition of the same question grouping requirements and different question banks, the speed of the improved random algorithm is obviously faster than that of the traditional random method, and the larger the question bank, the better the performance. Comparing Experiment 3 and Experiment 4, when the size of the question bank is the same and the

question quantity requirements are inconsistent, the increase in time consumption of the improved random algorithm shown in Figure 7 is significantly smaller than that of the traditional algorithm, and the performance is relatively stable.

Each end El of the educational intelligent programming analysis controller realized by software simulation 2C bus can be connected to external switch sensors (such as photoelectric sensors, contact sensors, and Hall sensors), analog sensors (such as photosensitive sensors, infrared sensors, acoustic sensor, and grayscale sensor), bus sensor (such as ultrasonic sensor), wireless dental monitoring module, LED dot matrix screen, indicator light and educational robot controller, etc. It is especially pointed out that the educational intelligent programming analysis controllers can be directly interconnected to form an intelligent programming analysis network, which is especially suitable for occasions where multiple intelligent programming analysis needs to cooperate to complete tasks.

$$\left\{ \prod t(x) \times [0, x, 1] - t(x) > 0, \prod t(x-1) \times [0, x, 1] - t(x) = 0, \prod t(x+1) \times [0, x, 1] - t(x) < 0. \right. \quad (18)$$

It can be seen from the article that after using the intelligent programming analysis algorithm, the repetition rate of the improved random algorithm is lower than that of the traditional algorithm, which makes the assignments of different students different and effectively curbs the widespread phenomenon of homework plagiarism. In terms of

performance, the improved random algorithm is greatly improved compared to the traditional random algorithm, and it is very suitable for the generation of homework with a small amount of question banks. However, in the case of a large number of question banks, the success rate of test grouping has dropped significantly.

$$\iint \sin \theta (A \times Gau(ss) \times T_h)^2 d\theta ds + \iint \sin \theta (A \times Gau(ss) \times T_w)^2 d\theta ds = 0. \quad (19)$$

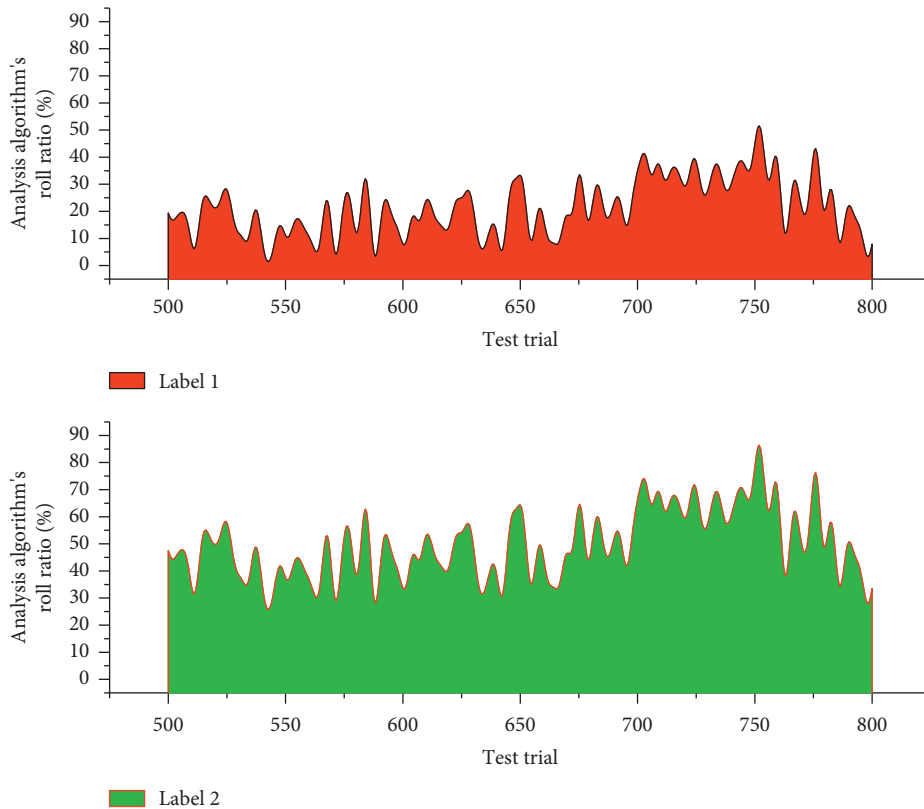


FIGURE 7: Comparison of intelligent programming analysis and control results.

In the teacher side of the homework subsystem, the teacher enters the requirements for the group test: chapters 1 to 9, 10 multiple-choice questions, 10 fill-in-the-blank questions, 2 points for each question, 4 short answer questions, 5 points for each question, and 5 calculation questions, each question is worth 8 points, and the difficulty factor is 0.5, as shown in the text. After setting the parameters, the question number of the generated test paper is shown in the text. It can be seen that the difference between the actual difficulty of the test paper and the required difficulty is within 0.025, and the number of questions meets the requirements.

6. Conclusion

According to the requirements of the system, after analyzing the advantages and disadvantages of the existing algorithms, this paper chooses an improved random algorithm based on intelligent programming analysis and implements it using php programming. It has a good test-setting effect for the assignments with the characteristics of small amount of questions and low difficulty requirements. Aiming at the problems of large amount of questions and high difficulty requirements in the examination group paper, the success rate of the above algorithm is reduced, and the genetic algorithm is used to improve it. At the same time, it is used in staged tests to play a role in guiding students' educational management by improving the

coverage of knowledge points. The functional test results show that the online homework and examination system developed by Apache + Mysql + PHP has a friendly user interface, flexible and convenient use, and good scalability and security. The scientificity and rationality of the algorithm are tested through a large number of test-setting experiments. The results show that the system can meet different test-setting requirements, well realize the expected functions of the online homework and examination system, and help guide students in their daily work. Education management is used to assist teachers in classroom education management, and implement the separation of teaching and examination. Among them, in order to meet the needs of users at different educational stages or different levels, two programming environments, graphical and C-like language, are designed; in terms of the C-like language compiler, a compilation structure with syntax analysis as the main line is adopted, and syntax guidance is adopted. The generated pseudomachine code is interpreted and executed by the virtual controller on the simulation platform. Through the study of human cognitive process by computer simulation method, the flexibility of electronic equipment in content and operation is fully utilized, and the abovementioned cognitive process makes the content of education management tend to be directly expressed, making the complex knowledge points simple and clear, which greatly improves the management efficiency of education managers.

Data Availability

The data used to support the findings of this study are available from the corresponding author upon request.

Conflicts of Interest

The authors declare that they have no conflicts of interest or personal relationships that could have appeared to influence the work reported in this paper.

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