

Retraction

Retracted: Ideological and Political Teaching Resource Sharing Method Based on Edge Computing

Wireless Communications and Mobile Computing

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This article has been retracted by Hindawi following an investigation undertaken by the publisher [1]. This investigation has uncovered evidence of one or more of the following indicators of systematic manipulation of the publication process:

- (1) Discrepancies in scope
- (2) Discrepancies in the description of the research reported
- (3) Discrepancies between the availability of data and the research described
- (4) Inappropriate citations
- (5) Incoherent, meaningless and/or irrelevant content included in the article
- (6) Peer-review manipulation

The presence of these indicators undermines our confidence in the integrity of the article's content and we cannot, therefore, vouch for its reliability. Please note that this notice is intended solely to alert readers that the content of this article is unreliable. We have not investigated whether authors were aware of or involved in the systematic manipulation of the publication process.

Wiley and Hindawi regrets that the usual quality checks did not identify these issues before publication and have since put additional measures in place to safeguard research integrity.

We wish to credit our own Research Integrity and Research Publishing teams and anonymous and named external researchers and research integrity experts for contributing to this investigation.

The corresponding author, as the representative of all authors, has been given the opportunity to register their agreement or disagreement to this retraction. We have kept a record of any response received.

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- [1] L. He, "Ideological and Political Teaching Resource Sharing Method Based on Edge Computing," *Wireless Communications and Mobile Computing*, vol. 2022, Article ID 3907721, 10 pages, 2022.

Research Article

Ideological and Political Teaching Resource Sharing Method Based on Edge Computing

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In the process of ideological and political teaching resource sharing, the sharing time is long due to the interference of redundant data. Therefore, an ideological and political teaching resource sharing method based on edge computing is proposed. Based on the sharing model of ideological and political teaching resources of edge computing, the information entropy suppression method is used to eliminate the redundant data in the ideological and political teaching resources, calculate the sinking of the edge node of the resource after removing the redundancy, assign the task to the edge node, and finally build a location index for the ideological and political teaching resources to realize the sharing of ideological and political teaching resources. The results show that when using the research method to share ideological and political teaching resources, the completion time, average waiting delay, and resource download time of resource sharing are shorter.

1. Introduction

Colleges and universities shoulder the important responsibility of cultivating talents, and their ideological and political work is closely related to the ideological quality of college students and is related to the long-term development of the country and the nation. Colleges and universities should strengthen the construction of online ideological and political work, enhance student interaction platforms, build online education websites, and carry out various ideological and political work in a way that college students love [1, 2]. In the era of big data, new characteristics of ideological and political work in colleges and universities have emerged: first, the massive amount data information on the Internet has impacted the minds of college students, and the information mixed with good and bad affects students' outlook on life and world outlook [3, 4]. Secondly, the Internet provides a convenience for college students to search for information, communicate, and express their personal opinions and is not limited by time and space. The ideological and political management work in colleges and universities faces new challenges. Finally, big data enriches the ideological and political content of college students. The current ideological and political work is no longer a single

ideological education but also includes interdisciplinary knowledge such as computer, communication, and psychology. In order to achieve precision teaching [5, 6], the related ideological and political teaching resource sharing methods have attracted the attention of scholars.

Reference [7] takes computer students majoring in science and technology as the research object, discusses the reform methods and strategies of ideological and political teaching in computer network courses, and puts forward the reform path and development direction of ideological and political teaching in network courses. Reference [8] provides a reflective analysis of how university educators experienced the transition to more and more online teaching in 2019 and pointed out that college educators create meaning by sharing online teaching experiences. Reference [9] proposes a new method for demarcation of difference data in measurement point data sharing of wireless sensor networks. The hidden Markov probability and statistics model is introduced, a fast calculation training method is selected, and it is applied to the training of difference data demarcation in wireless sensor network measurement point data sharing in the virtual simulation environment of the National Demonstration Center, which provides a basis for the demarcation

of difference data to achieve information management. Through the trained hidden Markov probability statistical model, the difference data demarcation is realized.

At present, B/S architecture, P2P technology, big data analysis, and other methods are commonly used in the sharing process of ideological and political teaching resources. However, due to the interference of redundant data in the sharing process, its sharing performance needs to be further improved. Edge computing refers to an open platform integrating network, computing, storage, and application core capabilities on the side close to the object or data source to provide nearest end services [10, 11]. Its application program is initiated on the edge side to produce faster network service response and meet the basic needs of the industry in real-time business, application intelligence, security, and privacy protection. Therefore, this paper introduces the edge calculation method in the process of Ideological and political teaching resource sharing. On the basis of constructing the ideological and political teaching resource sharing model, this paper uses the information entropy suppression method to reduce the interference of redundant data and realize the sharing of high quality and high speed.

2. Security Processing Model of Ideological and Political Teaching Resources Based on Edge Computing

Edge computing refers to a new computing mode [12, 13] that performs computing at the edge of the network. The processing of data mainly includes two parts: one is the downlink cloud service, and the other is the uplink of the Internet of Everything Serve. Among them, the “edge” in edge computing is a relative concept, which mainly refers to any computing, storage and network-related resources between the data source and the cloud computing center path. When constructing the security processing model of ideological and political teaching resources, this paper realizes it with the help of edge computing method.

2.1. The Sharing Model of Ideological and Political Teaching Resources Based on Edge Computing. The structure of the ideological and political teaching resource sharing model based on edge computing is shown in Figure 1.

As shown in Figure 1, the ideological and political teaching resource sharing model based on edge computing is divided into cloud computing platforms [14, 15], edge computing nodes, and wireless sensor application nodes. The wireless sensor application node belongs to the basic node of ideological and political teaching resource sharing [16]. It is mainly installed on the terminal equipment of the Internet of Things. The cloud computing platform can obtain the information of ideological and political teaching resources provided by the terminal equipment of the Internet of Things through the edge computing node. The collection of ideological and political teaching resources for IoT terminal devices by edge computing nodes is mainly realized through wireless sensor application nodes. The wireless sensor application node mainly communicates with the edge node. When it communicates with the cloud computing

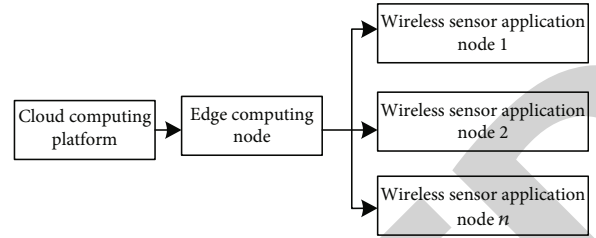


FIGURE 1: The sharing model of ideological and political teaching resources based on edge computing.

platform, the edge computing node belongs to the relay hub. This design can not only simplify the communication volume of the wireless sensor application node but also make full use of the edge computing node to ideological and political. Due to the advantages of efficient transmission of teaching resources, edge computing nodes can optimize the real-time transmission of ideological and political teaching resources and reduce the transmission delay [17, 18]. The ideological and political teaching resources based on edge computing are the ideological and political teaching resources transmitted through the edge computing nodes, which will be processed safely in the following sections.

2.2. Redundancy Elimination Method of Ideological and Political Teaching Resources Based on Information Entropy Suppression. In the ideological and political teaching resource sharing model based on edge computing constructed in Section 2.1, it is necessary to eliminate redundancy of ideological and political teaching resources based on edge computing [19] and optimize the quality of ideological and political teaching resources based on edge computing, so as to speed up thinking the processing speed of the security management of political teaching resources.

Information entropy belongs to the nonsequential index in the ideological and political teaching resource system [20, 21]. If the entropy is larger, the disorder of ideological and political teaching resources is significant [22]. Information entropy can judge the uncertainty of ideological and political teaching resources. In the security processing of ideological and political teaching resources based on edge computing, the use of information entropy suppression mode can remove duplicate ideological and political teaching resources and obtain better quality ideological and political teaching. Resource information reduces the processing efficiency of ideological and political teaching resources based on edge computing [23].

In general, use formula (1) to calculate the reduction rate of ideological and political teaching resources based on edge computing:

$$\Omega = \frac{C_j}{C_o}. \quad (1)$$

Among them, the number of bytes of repetitive ideological and political teaching resources based on edge computing is C_j ; the number of bytes after the repeated ideological and political teaching resources are removed is C_o . Even though formula (1) analyzes the redundant ideological and

political teaching resources between ideological and political teaching resources after compression and segmentation in each single ideological and political teaching resource block, it has not analyzed the processing overhead of ideological and political teaching resources [24]. In order to optimize the processing overhead of ideological and political teaching resources, the following formula is used to optimize the reduction rate of ideological and political teaching resources based on edge computing:

$$A_o = \frac{\Omega}{1+g}. \quad (2)$$

Among them, A_o is the optimized reduction rate; g is the processing cost of ideological and political teaching resources.

$$g = \frac{R_j}{D_j} \quad (3)$$

Among them, the size of ideological and political teaching resources based on edge computing and the average block size of ideological and political teaching resources are R_j and D_j in order.

Bloom filter belongs to an ideological and political teaching resource structure [25]. The ideological and political teaching resource structure of Bloom filter is used to describe the eigenvalues of ideological and political teaching resources based on edge computing as a set of information entropy mapping functions and a number of digits. Bloom filter randomly thinks the structure of political teaching resources is established by mapping the compressed parameter space through various information entropy functions, describing a random collection of ideological and political teaching resources through U vector and distinguishing the detailed relationship between ideological and political teaching resources and the collection with high precision. Calculate a specific amount of information entropy through the Bloom filter structure [26, 27], use a consistent number of information entropy functions, and set the value of the array position to 1.

In the initial mode of the ideological and political teaching resource structure of the Bloom filter, there is an array of n -bit ideological and political teaching resources based on edge computing, which can be set to 0, and the Bloom filter can be used to obtain a set of m ideological and political teaching resources y_m :

$$R = (y_1, \dots, y_m). \quad (4)$$

In the specified interval, h independent information entropy functions are used to map each ideological and political teaching resource in the set in turn; then, for a random ideological and political teaching resource y based on edge computing, the vector U is mapped to the j -th. The expression of the information entropy function is

$$U_j = \frac{R}{g}. \quad (5)$$

Set the continuous class subsequence in the ideological and political teaching resource section E , set a corresponding shingle, and set all the shingle sets of size ω to $R(E, \omega)$ in the ideological and political teaching resource section E , and then the implementation method of Bloom filter is as follows:

- (1) Establish an ideological and political teaching resource structure based on edge computing and set it to cg . This ideological and political teaching resource structure has n bits, and the initial value of all bits is set to 0
- (2) There are two kinds of information entropy functions in the setting mapping function [28], which are the information entropy 1 function and the information entropy 2 function in turn
- (3) Use the two functions in step 2 to sequentially calculate the summary value of the difference shingle and set the number of digits corresponding to cg to 1
- (4) The eigenvalue of setting ideological and political teaching resources is the output cg

To sum up, the information entropy suppression process can be transformed into a link that calculates the similarity of two ideological and political teaching resources.

Judging the similarity $I(a, b)$ of the Bloom filter by the Hamming distance [29, 30], when solving the Hamming distance, the ideological and political teaching resources \bar{A} and \bar{B} with different operation bits in the two binary sequences,

$$I(a, b) = \begin{cases} \frac{\bar{A} \cdot \bar{B}}{\|\bar{A}\| \cdot \|\bar{B}\|} \\ \frac{\sum_{j=1}^m A_j B_j}{\sqrt{\sum_{j=1}^m A_j^2 \sum_{j=1}^m B_j^2}} \end{cases}. \quad (6)$$

In the formula, $\bar{A} \cdot \bar{B} = \sum_{j=1}^m A_j B_j$. j is the processing times of ideological and political teaching resources. A_j is the digit whose value is 1 in the Bloom filter ideological and political teaching resource structure; the digit whose value is 0 is B_j . All ideological and political teaching resources in the set $R = (y_1, \dots, y_m)$ are mapped to the n -bit array through h information entropy functions. The detailed method is as follows:

$$q = \left(1 - \frac{1}{n}\right)^{hm}. \quad (7)$$

Among them, q is the value after the ideological and political teaching resources based on edge computing are mapped to the n -bit array.

If the ratio of the current value of 0 in the array is set to be δ , then if the value of δ is not unknown, the calculation method of the error rate is

$$(1 - \delta)^h \approx (1 - q')^h \approx (1 - q)^h. \quad (8)$$

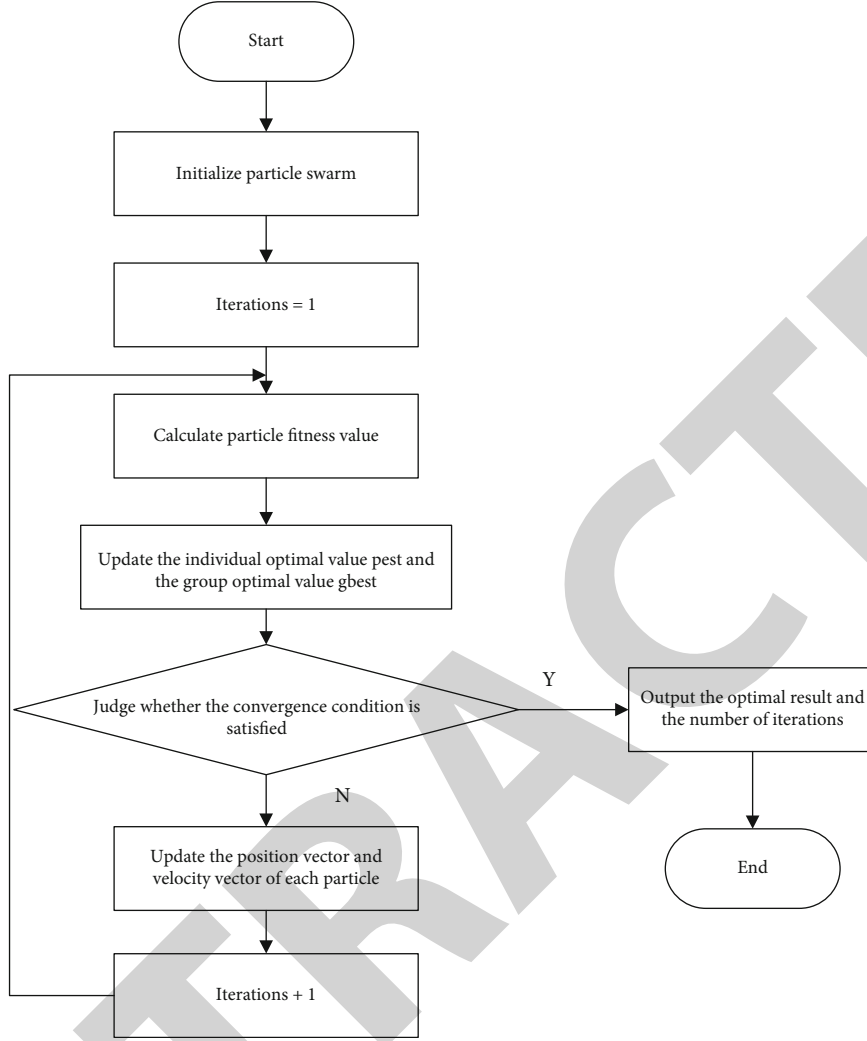


FIGURE 2: The basic process of particle swarm optimization.

If the number of digits in the array of ideological and political teaching resources based on edge computing is n , then the amount of ideological and political teaching resources is n , the number of optimal information entropy function functions is f , and the method of converting f is as follows:

$$f = -\frac{n}{m} \ln(q) \ln(1-q). \quad (9)$$

The ideological and political teaching resources that suppress information entropy can be eliminated by taking the derivation, and then

$$F = \frac{h \ln m}{\ln(q) \ln(1-q)}, \quad (10)$$

where h is the number of recursion. F is a collection of ideological and political teaching resources based on edge computing after redundancy is eliminated.

2.3. Edge Node Sinking Calculation. Particle swarm optimization is a global random search algorithm that simulates the foraging process of flocks of birds [31, 32]. The basic flow of the algorithm is shown in Figure 2.

The particle swarm algorithm has a major disadvantage; that is to say, since there is no limit to the changing position of the particles in the particle swarm algorithm, it is very possible to go to a particularly weak position. The closer each particle of the group is to this position, the faster the convergence speed. Therefore, in order to solve the above problems, an annealing algorithm [33] is introduced into the particle swarm optimization algorithm, so that the problem of local optimization can be avoided in the iterative process.

Taking edge nodes as particles, the sinking strategy of edge nodes under the hybrid algorithm is as follows:

Step 1. Set parameters and initial values.

Step 2. Calculate the next position and velocity of the particle.

Step 3. Calculate the fitness difference ΔE between the current position and the next position.

Step 4. Determine whether the ΔE difference is greater than 0? If it is greater than that, proceed to the next step; otherwise, further judge whether the probability of particles tending to equilibrium at temperature T is less than the selection probability of each solution. If it is less than, continue to the next step; if it is greater than, the position will not be updated and jump to step 6.

Step 5. Update the particle to the next position.

Step 6. Update the global best vector and best fitness and save the possible best solution.

Step 7. Update the inertia weight cooling annealing factor.

Step 8. Determine whether the maximum number of iterations has been reached. If it is reached, continue to the next step; otherwise, go back to step 2.

Step 9. Calculate the proportion of possible solutions.

Step 10. Select the edge node mapping position by roulette.

Step 11. The sinking calculation ends.

3. Realize the Sharing of Ideological and Political Teaching Resources

After using the above model to realize the security processing of ideological and political teaching resources, the security of ideological and political teaching resources in the cloud environment is guaranteed. By analyzing the cloud storage structure [34, 35], a storage model of ideological and political teaching resources is established, and a sharing mechanism is set up to achieve the purpose of safe sharing of ideological and political teaching resources.

3.1. Analysis of Cloud Storage Structure. Commonly used cloud storage structures include access layer, interface layer, management layer, and storage layer. The access layer can provide the user with the use interface, which is usually implemented by the client. In order to ensure the privacy of ideological and political teaching resources, users use the information provided by the server to complete the encryption operation and then use the network to transmit the information to the ideological and political teaching resource management center. Compression processing uses the network to send to the storage layer for storage. The schematic diagram of the cloud structure is shown in Figure 3.

3.2. Shared Role Definition and Shared Model Establishment

3.2.1. Role Definition. The sharing scheme formulated in this paper includes three roles: cloud storage device, information owner, and sharing request user. Their basic responsibilities are as follows:

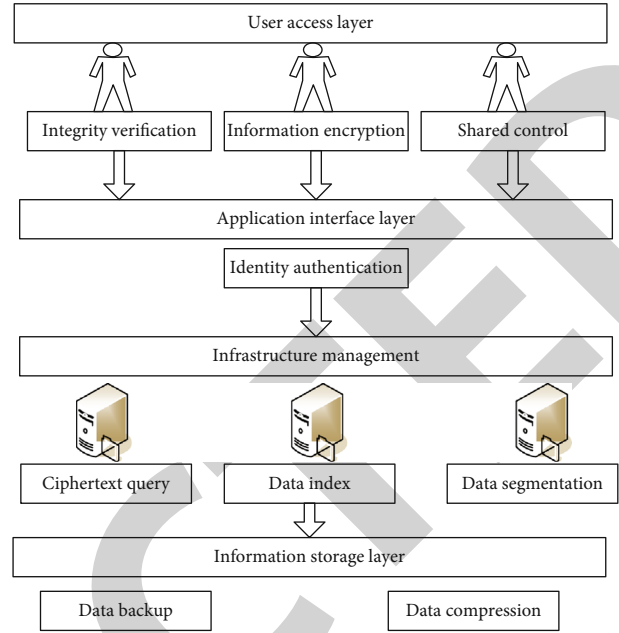


FIGURE 3: Schematic diagram of cloud structure.

- (1) Cloud storage device [36] provides storage space for ideological and political teaching resources, and users can purchase cloud space through the server to facilitate recording information
- (2) Information owner: all users have the function of recording and storing information, can perform information encryption operations and set sharing permissions. Only users who meet the sharing permissions can obtain the decryption key and obtain the initial plaintext information. It is assumed that the owner of the information is A
- (3) Sharing request user: cloud user can send a sharing request to the information owner and set the requester as B

In this sharing scheme, the identities of the information owner and the requester are both authentic and valid, and all information owners are credible, but the sharer is not necessarily credible.

The sharing process includes storage node M_j and transmission node $T_n C$. The former is responsible for information storage, and the latter is responsible for secure transmission.

Before the information owner makes a storage request, the leader node needs to be selected among the many nodes. Then, the storage and transmission of nodes are realized within the RAFT protocol cluster. The RAFT protocol relies on the leadership node to maintain the consistency of ideological and political teaching resources; so, the information flow is from the leadership node to the mass node movement. During the storage process, all nodes elect the leader through democratic votes, and other nodes obey the leader's instructions.

3.3. Sharing of Ideological and Political Teaching Resources Based on Location Index. Based on the bit string, a location

index is constructed for each node to realize the search and positioning of shared resources and to provide a faster download address for the shared resources of subordinate nodes. Creating an index is equivalent to establishing a target for a resource. Users can quickly find the desired content based on the page number address in the directory to facilitate resource acquisition.

The sharing of ideological and political teaching resources based on the location index in this chapter is divided into two stages of tasks. The first stage encodes the resource location and builds the indexed ideological and political teaching resources; the second stage is based on the indexed ideological and political teaching resources. Quickly locate and obtain resource locations to realize resource sharing.

3.3.1. Construction of the Location Index of Ideological and Political Teaching Resources. The construction steps of the location index of ideological and political teaching resources are as follows:

- (1) Based on the established index and the sinking of computing tasks, the sharing of ideological and political teaching resources is realized. First, a subordinate provincial user submits an application for sharing ideological and political teaching resources. The upper-level national grid central service center receives the application and assigns the resource search task to the edge node according to the application. The edge node calculates the relevant resources according to the location index. The results are fed back to the national power grid central service center. At this time, the service center forwards the results of the address of the resource to the client, and the user can browse and download it by himself, realizing resource sharing

Step 1. Use the mean clustering algorithm to classify ideological and political teaching resources.

Step 2. Select the index structure type. Select the commonly used HR attribute index here.

Step 3. Calculate the distance from each node in each cluster to the cluster center.

Step 4. According to the size of the distance, assign binary codes of different lengths to each node.

Step 5. Organize the coding of all ideological and political teaching resource objects into a two-level index tree structure, including global indexes and local indexes.

4. Simulation Experiments and Analysis

In order to test the sharing ability of the sharing method studied, this paper selects the completion time of resource sharing, average waiting delay, and resource download time as the evaluation indexes, carries out simulation experiment

TABLE 1: Parameter settings.

Name	Parameter
Particle scale	40
Dimension of each particle	2
Learning factors c_1 and c_2	$C_1 = c_2 = 2$
Cooling factor	0.99
Sinking speed weight	$a = 0.5$
Sink time weight	$b = 0.5$
Inertia weight	0.809
The maximum number of iterations	200

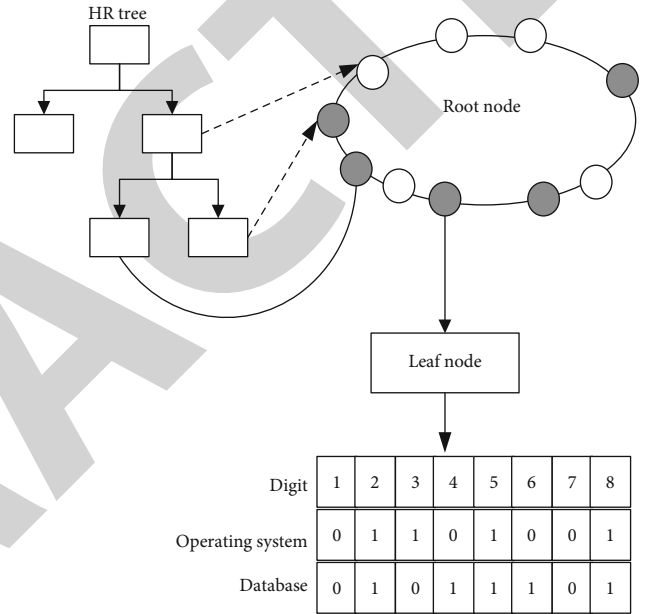


FIGURE 4: Location index of ideological and political teaching resources.

TABLE 2: Shared capability assessment results.

Method	Resource sharing completion time/s	Average waiting time/s	Resource download time/s
The method of this paper	5.62	1.36	3.66
Reference [7] method	8.25	2.52	6.02
Reference [8] method	7.23	2.42	5.63

analysis, and compares the application effect with the sharing methods in reference [7] and reference [8].

4.1. Sharing Tools. The ideological and political teaching resource sharing platform based on edge computing is composed of a joint service platform and a cloud platform of production, education, research, and other units. The joint service platform integrates the cloud platforms of different units and provides different OpenAPIs for the cloud platforms of each unit, so that the ideological and political

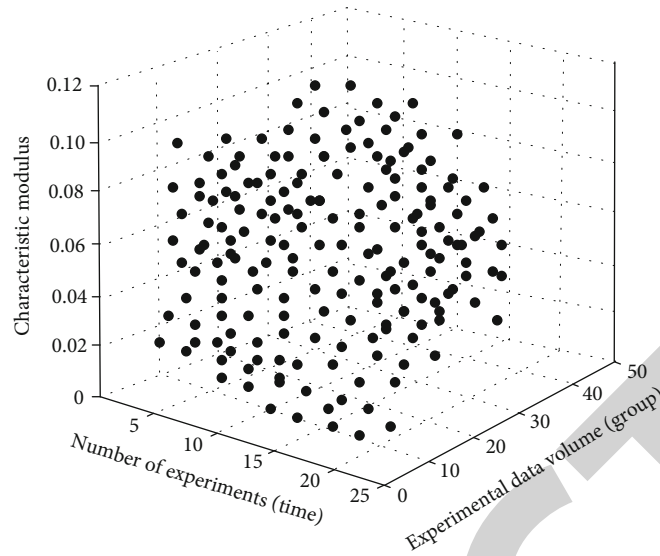


FIGURE 5: The method of this paper.

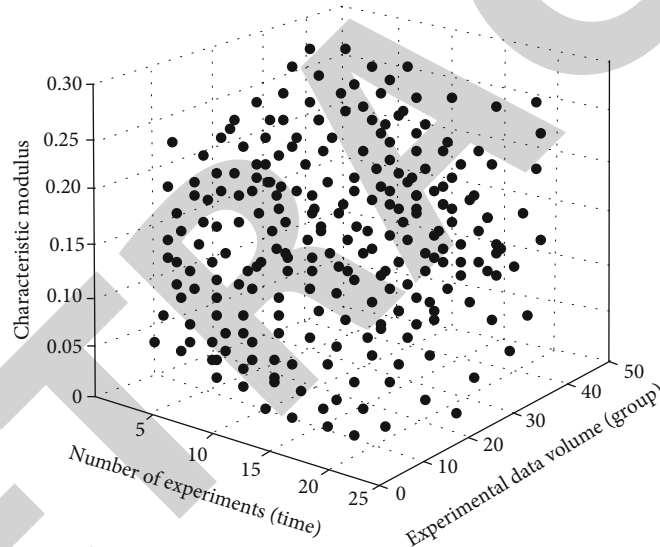


FIGURE 6: Reference [7] method.

teaching resources of each node can be effectively utilized, and the main server is responsible for the effective management of the entire file system. It provides a more convenient operation platform for the sharing of ideological and political teaching resources.

4.2. Algorithm Parameter Settings. In the sinking calculation of edge nodes, when the particle swarm algorithm is used, the key parameter settings are shown in Table 1.

4.3. Establish a Location Index of Ideological and Political Teaching Resources. Based on the above research, the location index structure of ideological and political teaching resources (3 categories and 277,689 ideological and political teaching resource packages) is established, as shown in Figure 4.

4.4. Analysis of Results. The ideological and political teaching resources are shared by using the research method in this paper and the sharing method of reference [7] and reference [8], and then the completion time of resource sharing, average waiting time, and resource download time is counted, and finally, a comparative analysis is carried out. The statistical results are shown in Table 2.

It can be seen from Table 2 that when sharing ideological and political teaching resources by using the research method, the sharing completion time is 5.62 s, the average waiting delay is 1.36 s, and the resource download time is 3.66 s, which is shorter than that of reference [7] and reference [8], indicating that the sharing ability of the research method is stronger. The main reason is that the research method uses the information entropy suppression method to remove the interference of redundant data and improved sharing capabilities.

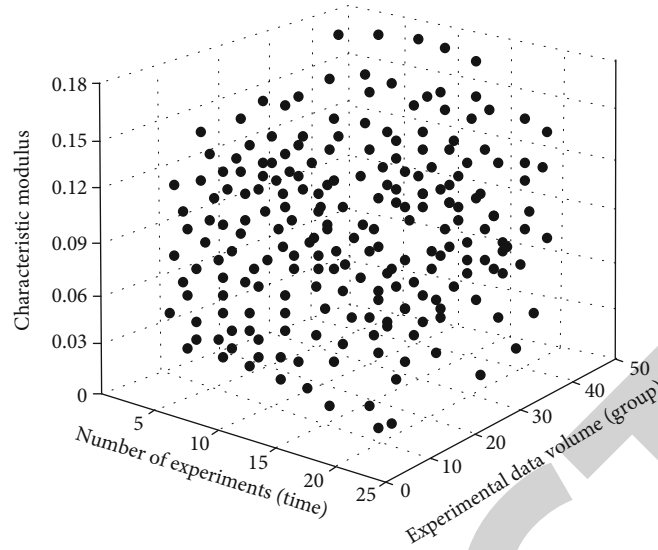


FIGURE 7: Reference [8] method.

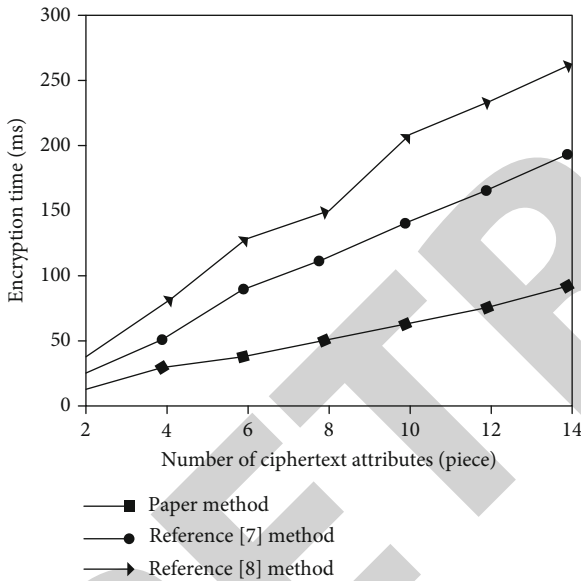


FIGURE 8: Comparison of encryption time of different algorithms.

The characteristic distribution of ideological and political teaching resources is used to judge the privacy performance of ideological and political teaching resources, and the characteristic model value is used as the evaluation standard. The test results are shown in Figures 5–7.

It can be seen from Figures 5–7 that through the analysis of the characteristic modulus value of the ideological and political teaching resources on the ordinate, after using the method in this paper to safely process the ideological and political teaching resources, the characteristic modulus value is in the range of $0 \sim 0.10$, while the characteristic modulus of the other two methods has a large distribution range. The distribution of eigenmode values is large. It shows that after the encryption processing of the proposed method, the characteristics of ideological and political teaching resources are significantly reduced, the distribution is chaotic, and the

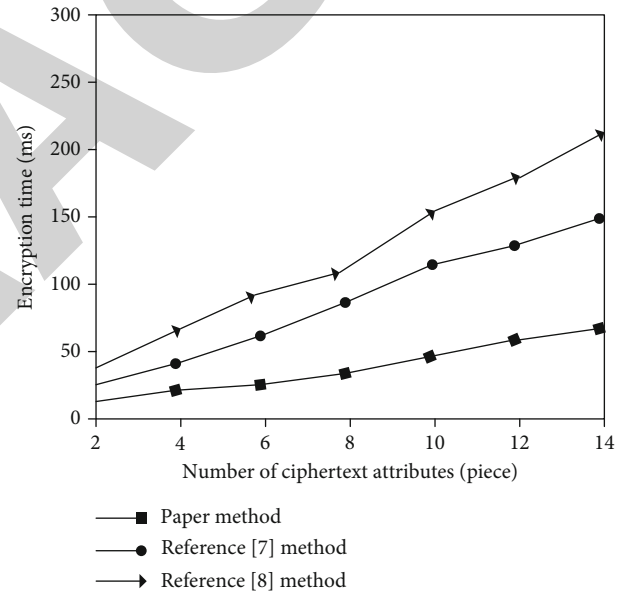


FIGURE 9: Comparison of decryption time of different algorithms.

characteristics are not strong, so as to reduce the possibility of being cracked and improve the confidentiality of ideological and political teaching resources.

In order to compare the efficiency of sharing the ideological and political teaching resources of the three algorithms, the time required for encryption and decryption is used as the evaluation index, and the encryption and decryption times of different algorithms are obtained when the number of ciphertext attributes is the same. The test results are shown in Figures 8 and 9.

Figures 8–9 show that the decryption time of all algorithms on the whole is less than the encryption time. This method shows good time performance in the process of encryption and decryption. The time is short, and the maximum time is 60 ms. With the increase of the number of

TABLE 3: The number of ideological and political teaching resources cracked by different algorithms.

Number of ideological and political teaching resources/article	Number of ideological and political teaching resources cracked by different methods		
	The method of this paper	Reference [7] method	Reference [8] method
500	0	0	0
1000	1	5	8
2000	1	20	25
5000	5	47	66
10000	7	59	83
20000	8	78	101

ciphertext attributes, the time required does not increase significantly. This is because the edge computing process is simple and will not waste a lot of waiting time for users.

Assuming that the simulation environment is the same, under the security protection of the above three methods, different amounts of ideological and political teaching resources are shared, and the number of ideological and political teaching resources cracked is used as an indicator to obtain the success rate of safe sharing of different algorithms. The comparison results are shown in Table 3.

Table 3 shows that when the total number of ideological and political teaching resources is 500, the ideological and political teaching resources that have not been cracked by the three algorithms can be safely shared. With the continuous increase of sample ideological and political teaching resources, this method still maintains a low number of cracks, and the maximum number of cracks is 8. The number of other two methods increases rapidly, and the sharing success rate decreases gradually. On the one hand, the proposed reencryption algorithm can ensure the security of ideological and political teaching resources, and on the other hand, a contract for the sharing of ideological and political teaching resources has been formulated, which provides a double guarantee for the safe sharing of ideological and political teaching resources and improves the success rate of sharing.

5. Conclusion

Cloud computing technology has become a new way to store and share ideological and political teaching resources. However, not all service providers are completely credible; so, the safe sharing of ideological and political teaching resources has become a hot topic. This paper proposes a secure sharing method based on edge computing for ideological and political teaching resources. By sinking the computing task to other edge nodes, this method reduces the computing pressure of the central network and effectively improves the ability of resource sharing. The experimental results show that when sharing ideological and political teaching resources, the sharing completion time is 5.62 s, the average waiting delay is 1.36 s, the resource download time is 3.66 s, and the maximum encryption and decryption time is 60 ms. With the increase of the number of ideological and political

teaching resources, the number of cracked resources is increasing, but less than 8. It can be seen that the proposed method realizes the safe sharing of high-quality ideological and political teaching resources.

Data Availability

The raw data supporting the conclusions of this article will be made available by the author, without undue reservation.

Conflicts of Interest

The author declares that he/she has no conflicts of interest regarding this work.

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