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Retraction

Retracted: Design of University Educational Administration Management System Based on Sensor Data and Multidimensional Information Fusion

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This article has been retracted by Hindawi following an investigation undertaken by the publisher [1].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.

References

[1] K. Qin, "Design of University Educational Administration Management System Based on Sensor Data and Multidimensional Information Fusion," *Wireless Communications and Mobile Computing*, vol. 2022, Article ID 6708033, 10 pages, 2022.

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Research Article

Design of University Educational Administration Management System Based on Sensor Data and Multidimensional Information Fusion

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With the rapid development of education informatization, especially the promotion and reengineering of education business processes by big data and artificial intelligence, how to participate in this major change is the main issue that needs to be considered. Therefore, under the guidance of multisource sensor data fusion technology, this paper adopts the traditional cloud computing operation method, that is, centralized data center processing, which is difficult to adapt to the rapidly expanding data scale. We also propose a new perceptual adaptive data processing method. By designing an edge node adaptive data type sensing mechanism based on counting bloom filter, we can automatically identify the ubiquitous University Internet of things data categories and corresponding fields. The simulation results show that this method improves the recognition accuracy of different data categories in university management by more than 1.3%, which can help teachers use educational technology to do well in the teaching work before, during and after class, and promote the practical application of new teaching modes such as inquiry teaching.

1. Introduction

Education management in colleges and universities is the key to the construction of educational technology facilities, application promotion, business training, and technical support in schools [1]. As educational information technology has entered a new era, the work undertaken is bound to change, so how we can do a good job in the innovative practice of educational technology in colleges and universities is a natural question for those in charge of our educational technology institutions to consider [2].

In the past 40 years, China's education has undergone fundamental changes. Digital campuses have been built to varying degrees at all levels and in all types of schools across the country; the coverage of multimedia classrooms in developed regions has basically reached 100% [3]; teaching resource platforms have been gradually applied as teaching aids in daily teaching; the state has concentrated on building a large number of high-quality courses, high-quality course resources and online courses, discussion-based, flipped classrooms, and blended learning are emerging in campus classrooms, and information technology and educational practices are continuously integrating [4]. It can be seen that education will become more dependent on computers and other technologies.

Information technology is an advanced tool that mainly emphasises the deep integration of information technology with the curriculum and teaching practice. Information technology enhances the teaching environment and facilities on campus, improves the form of teaching and learning, and is a means to improve teaching efficiency and quality [5]; information technology will change the mode of talent training, education service mode, and social governance mode and will build a new education ecology, which is an essential part of the education system [6]. It is an essential component of the education system [7].

In the information age, massive amounts of data is generated every day, which provides us with the possibility of finding certain real situations or analyse changing trends. If the massive amount of data collected is classified and

analysed in a certain dimension, we will find the valuable information we want [8].

The comprehensive use of big data in education is an important feature of the era of education informatization 2.0 and will become one of the grasping hands to promote equity, improve the quality of education, and accelerate education reform in China [9]. Big data can reflect the real situation of education and teaching from different dimensions [10]. Analysing macro data can check the status of implementation of national education policies so that precise policies can be implemented; analysing individual data can paint a portrait of students so that teaching can be tailored to their needs; analysing changes in data can reveal new trends in education and teaching; analysing data on the learning situation of a large number of students, correlating influencing factors, and applying guidance strategies can explore new laws of education and teaching [11].

Compared to traditional classrooms, smart classrooms have distinctive features. The new smart classroom should have no podium area, so that teachers can easily move around and mingle with students; the desks and chairs in the smart classroom should be movable, and the combination is flexible and variable, so that teachers can facilitate group discussions [12]; the blackboard (whiteboard) in the classroom has a memory function and can upload the teacher's notes to the server in the form of vector graphics, so there is no need for students to take notes in class, and students only need to pay attention to the lesson or interact with the teacher; there should be a main display (main projection) and several auxiliary display screens for students to use in group discussions. The classroom should have a main display (main projection) and a number of auxiliary screens for students to use in group discussions, and the switching of signals on the screens must be convenient for teachers and students [12]. The smart classroom provides practical and convenient functions for teachers and students. There are wireless screen casting functions to facilitate teachers' and students' laptops and mobile phones to easily cast their files onto the large screen; Wi Fi coverage in the classroom; electronic class signs installed at the classroom entrance to display the classroom's scheduling situation, which can also be used as an attendance facility for students to sign in, and if face recognition technology is used in the classroom to achieve perception-free attendance, it is more convenient for teachers and students [13–15]. This design is adapted to the characteristics of teaching.

2. Edge Nodes in Intelligent University Management

2.1. Adaptive Data Classification Mechanism. The bloom filter is an information retrieval method specifically designed for information retrieval [16]. The bloom filter criterion is in IoT, let the bloom filter be b, which consists of a string of n feature bits and k hash functions. The bloom filtering operation consists of two processes, as shown in Figure 1.

2.1.1. Placement Process. Initially, the bit string is set to 0. For a known data set, the hash number {0, 1} is used for marking, where the IoT data set is recorded as S_I and marked with 1; the non-IoT data set is recorded as S_{NI} and marked with 0. For an unknown data set $S = \{x_1, x_2, \cdots, x_n\}$, for each element $(1 \le i \le m)$, k hash functions are computed to obtain k values in the range $x_i\{1, 2, \cdots, n\}$, which are mapped to k positions in the feature bit string. If the bit is 0, it is set to 1, if the bit has already been set to 1 by a previous element, it remains unchanged [17]:

$$f = \left(1 - \left(1 - \frac{1}{F_{\text{data}}}\right)^{k(S_I - S_{NI})}\right)^k \approx \left(1 - e^{-k(S_I - S_{NII})/(S_I - S_{NI})}\right)^k. \tag{1}$$

The bloom filter has the smallest probability of forward false detection when and only when $k = F_{\text{data}}/S_T - S_N \ln 2$ is $f = 0.5^k$.

Therefore, the probability that the counter plus 1 operation is performed j times for the i-th element is

$$P(c(i) = j) = \binom{(S_I - S_{NI})k}{j}\left(\frac{1}{F_{\text{data}}}\right)^j\left(1 - \frac{1}{F_{\text{data}}}\right)^{(S_I - S_{NI})k - j}, \tag{2}$$

where $c(i)$ is the counter value corresponding to element x_i; $\binom{(S_I - S_{NI})k}{j}$ denotes the combined number solution.

2.2. Data Processing Methods. As shown in Figure 2, a data file File consists of the file type (IoT/non-IoT), the file length, and the associated flag bits. Since files are not contiguously stored on physical hardware on physical hardware, the end-of-file EOF is used to flag data calls from top-level advanced applications for both IoT data and non-IoT data. Generally speaking, there are the following 3 steps.

In this study, the functionality and practicality of the blockchain application technology for agricultural products trading process will be initially extended and improved by adopting the multichain blockchain technology in conjunction with the P2P agricultural product trading method. The multichain blockchain trading platform for agricultural products has three main functional applications: credential registration and management, financial transactions, and supply chain management. The main applications of credential registration and management include providing information such as user DCs, equity credentials, and proof of qualification (authority). The main applications of financial transactions include the use and transaction of transaction funds, payment, clearing, and settlement of financial assets. The main applications of supply chain management include logistics management, product traceability and anticounterfeiting, and procurement and inventory management. In the blockchain network, different channels are automatically assigned to different transaction systems, and the transaction information and user information in the channel are only visible to the nodes participating in the transaction. Each channel runs an independent smart contract script, and the

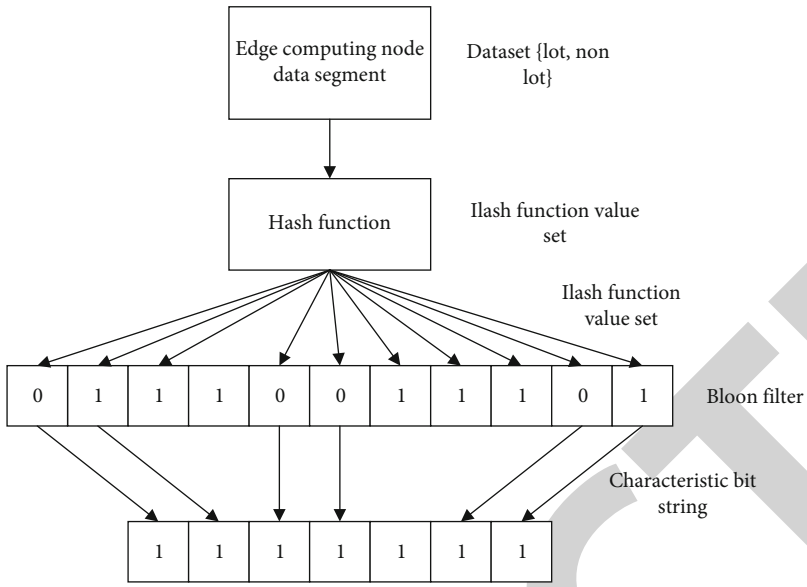


Figure 1: Adaptive classification mechanism for edge node data.

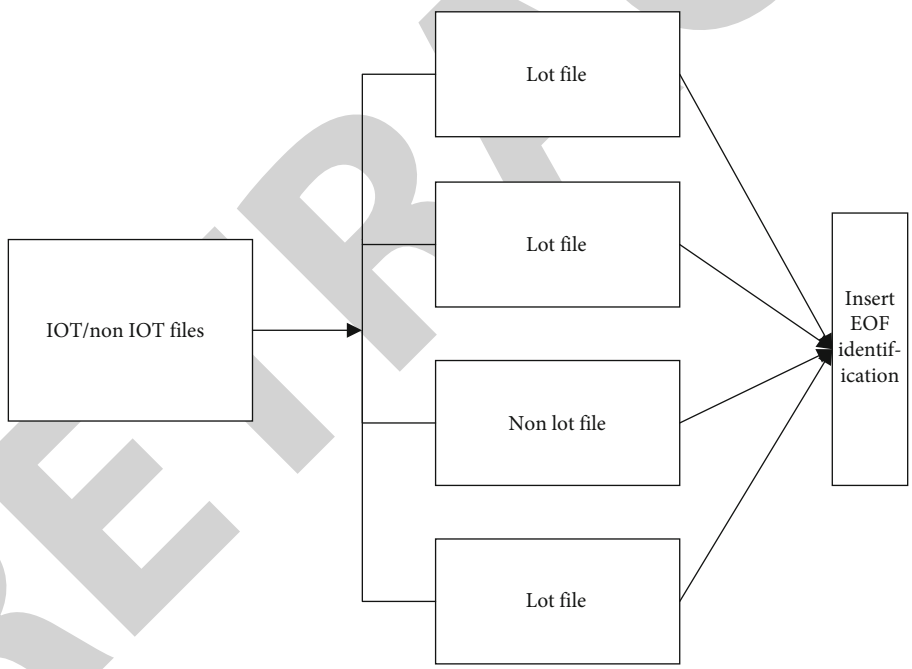


Figure 2: Data file structure.

consensus of the transaction is established by all user nodes participating in the transaction.

Each channel runs an independent smart contract script, and all user nodes participating in the transaction establish the consensus information of the transaction, with higher consensus efficiency, while providing privacy protection of transaction-related information, as shown in Figure 3.

Based on the idea of genetic algorithm, a large number of purely numerical function optimization experiments have been conducted on computer. Based on a series of research work, the basic framework of genetic algorithm was summarized by Goldberg in the 1980s. Change the gene value on one or some motifs to other alleles with a certain probability (called mutation rate).

The basic flowchart is shown in Figure 4.

3. Algorithm Validation and Analysis

To verify the effectiveness and feasibility of the proposed edge node adaptive-aware data processing method, this chapter evaluates the data classification performance, end-

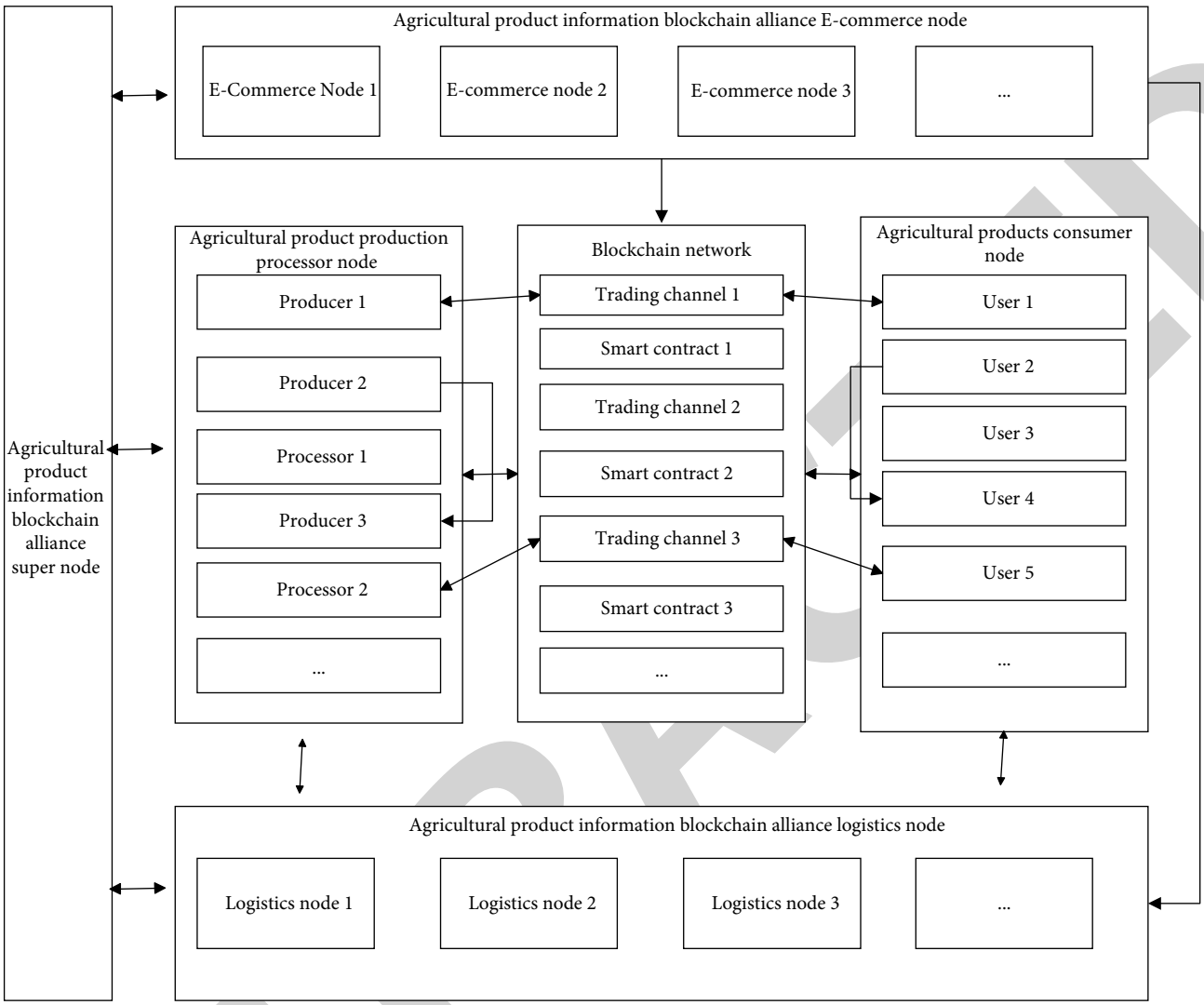


Figure 3: Transaction process of agricultural products with multiblockchain.

of-file EOF tagging, and copy management performance in three aspects.

3.1. Experimental Platform and Test Dataset. Simulate each computing node in edge computing, as shown in Table 1.

The test dataset uses operational data from a distribution network in a city in Jiangsu province, with a total of 495 nodes containing measurements on 1,000 lines, with 400 MB of IoT and non-IoT data.

3.2. Results and Analysis

3.2.1. Data Classification Performance. To verify the classification performance of the proposed counting bloom filter on IoT data, the conventional bloom filter in the literature [18] and the proposed extended bloom filter in the literature [19] are used for comparison.

Figures 5 and 6 show the classification results of the conventional bloom filter and the proposed counting bloom filter for the same dataset and the corresponding false detection rates, respectively [20].

3.2.2. End-of-File EOF Plug-In Marker. For both sorted IoT and non-IoT data, the EOF [21] plug-in first opens it in protected mode (e.g., by calling the mask function in Hadoop) and calls the read_seg function to analyse the length of the file and the associated identification bits. Further, the EOF plug-in ensures that the sorted IoT and non-IoT data has full parity bits by calling the ASM_File function. Finally, an additional marker bit is added to the file data to ensure that the data is not tampered with during transfer sharing before the file is copied for management [22].

The further processing of the file after classification using EOF is shown in Figure 7, with the final file being divided into 3,000 segments. The amount of IoT data, non-IoT data, and other file data after classification using counting bloom filtering in Section 3.2.1 were 320, 70, and 10 MB, respectively, where the other file data contained some error data such as missing data and miscoded data. For those

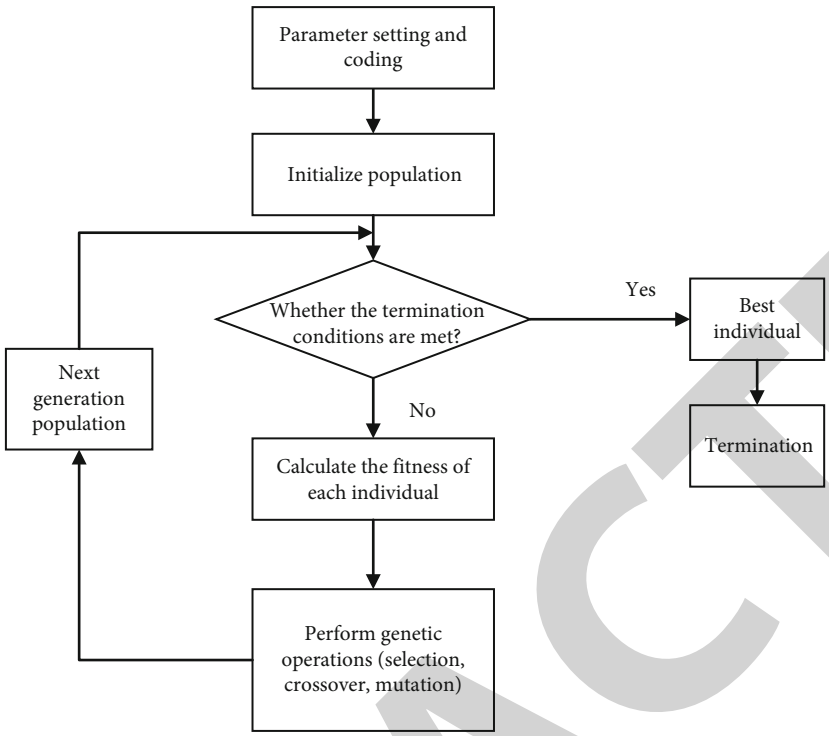


Figure 4: Basic flowchart of genetic algorithm.

Table 1: Hadoop-based virtual machine configuration.

Node	CPU kernel configuration	Memory/GB	Hard disk	To configure
Master node	6	32	HDD/SSD	InterXeon
Slave node 1	2	3	HDD/SSD	InterXeon
Slave node 2	2	3	HDD/SSD	Inter Core i5
Slave node 3	2	3	HDD/SSD	Inter Core i5
Slave node 4	2	3	HDD/SSD	Inter Core i5

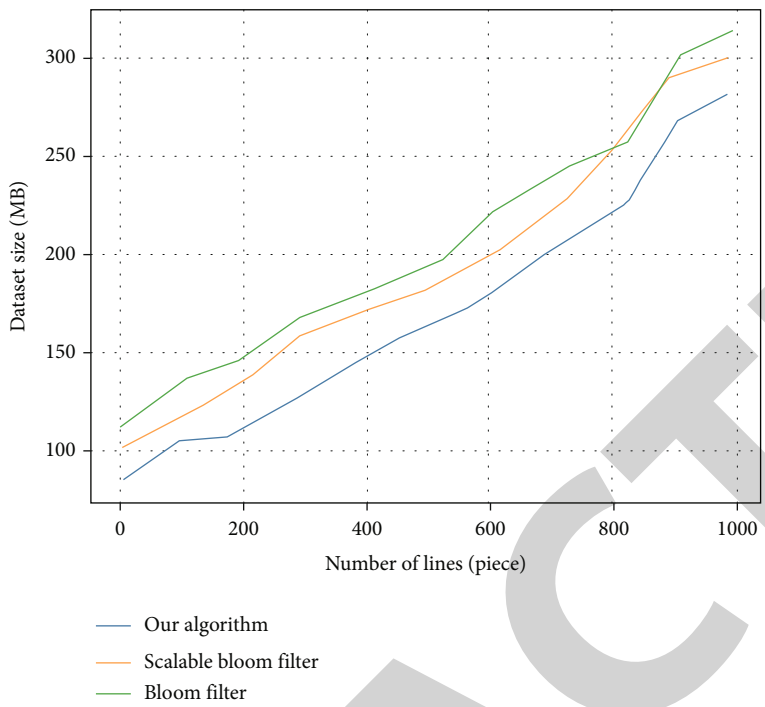
erroneous data, Hadoop puts them into a dedicated stack for indexing and discards them when new data files arrive.

3.2.3. Data Copy Management Performance. To compare and validate the performance of the proposed data copy management method, the centralized copy management method proposed in the literature [23] was used for comparison. Figure 8 shows the response times of the two methods for 3000 data fragment [24].

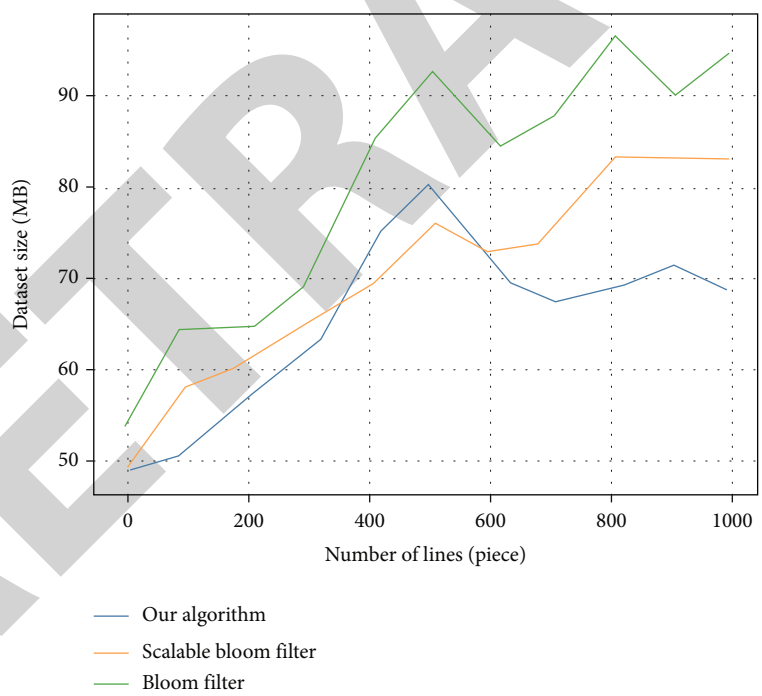
4. Discussion

All school work should be people-oriented, educational technology work is no exception, and it is necessary to adhere to the concept of student development as the center. In education, the teacher is the leader and the student is the main subject, and "all for the development of each student" is the core concept of education for students. In the Information Technology 2.0 era of education, students can use information technology to help improve their learning efficiency, students can use information technology to live more conveniently, and schools can use information technology to manage more finely.

Information technology facilities should be "applied as king." In the past 10 years, such information systems and facility utilization rate are not high, and esome schools or areas of information technology construction goals and positioning are somewhat vague, built for the sake of having, built for show, and built after the application of how to do not do in-depth planning and deployment, eventually becoming ornamental. In the past 10 years, the utilization rate of such information systems and facilities is not high, the information technology construction goals and positioning of some schools or regions are somewhat vague, and how to do in-depth planning and deployment after the application has become ornamental. To change the status quo, we must be

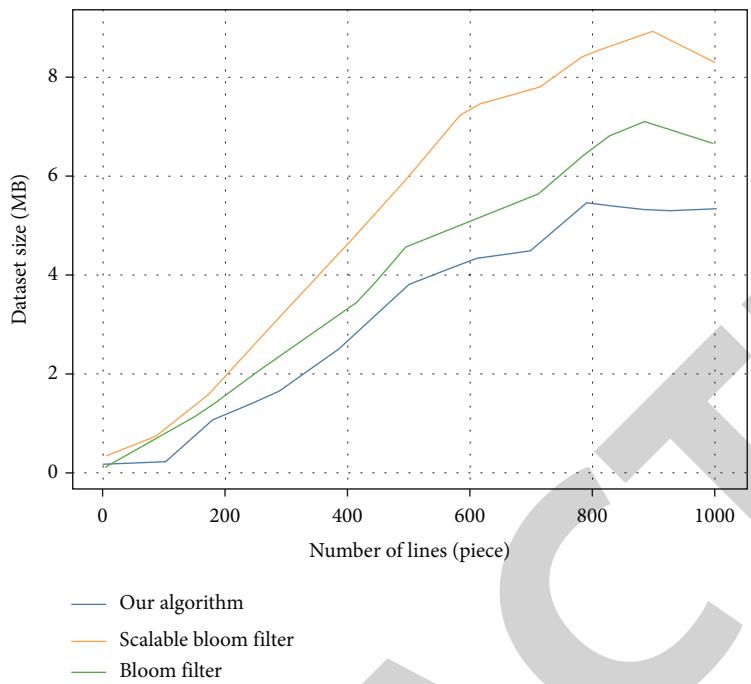


(a) IoT data



(b) Non-IoT dataset

Figure 5: Continued.



(c) Other dataset

Figure 5: Classification results of the conventional bloom filter and the proposed counting bloom filter for the same data set.

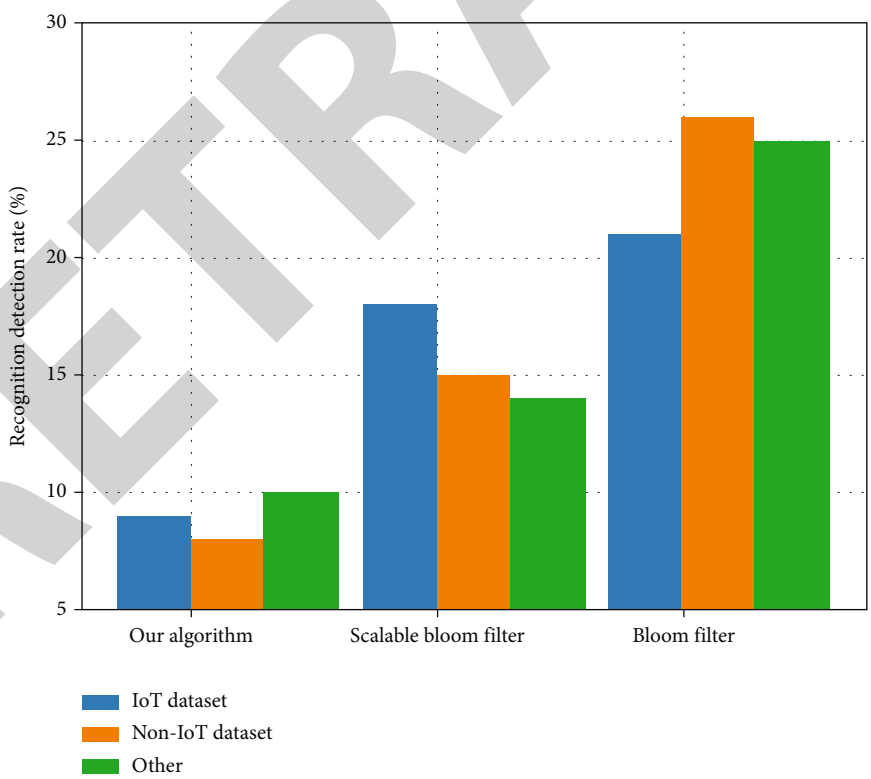


Figure 6: False detection rate of data classification.

solution-oriented and application-driven; when building the software platform, we must fully consider the experience of teachers and students and conform to their habits and styles, so as to achieve the goal of "letting data run more and teachers and students run less;" after completion, the information technology department should strengthen training for teachers

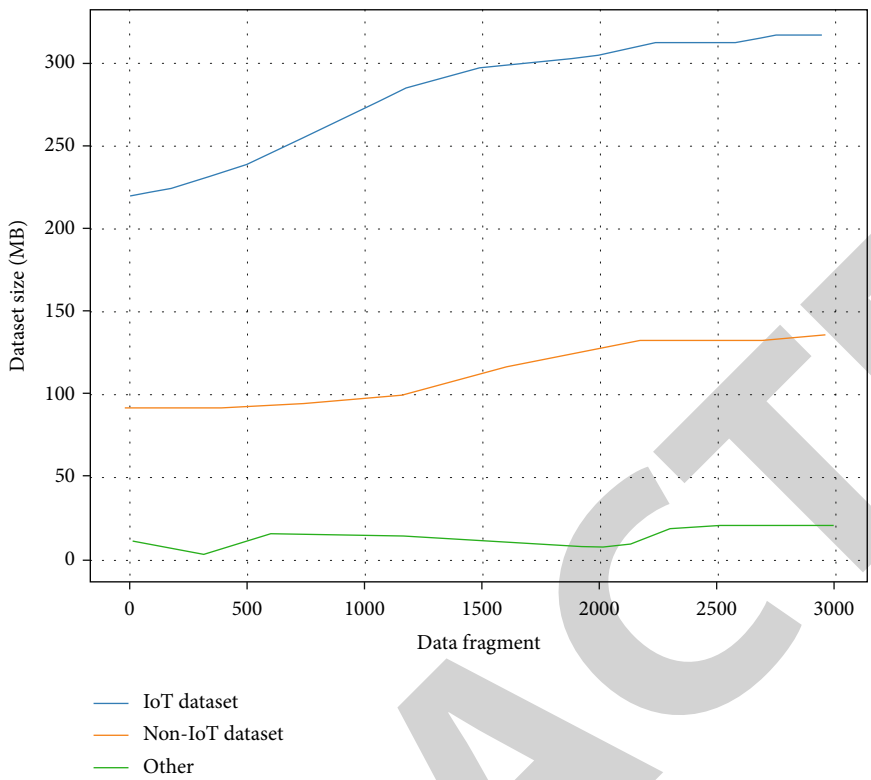


Figure 7: EOF plug-in processing results.

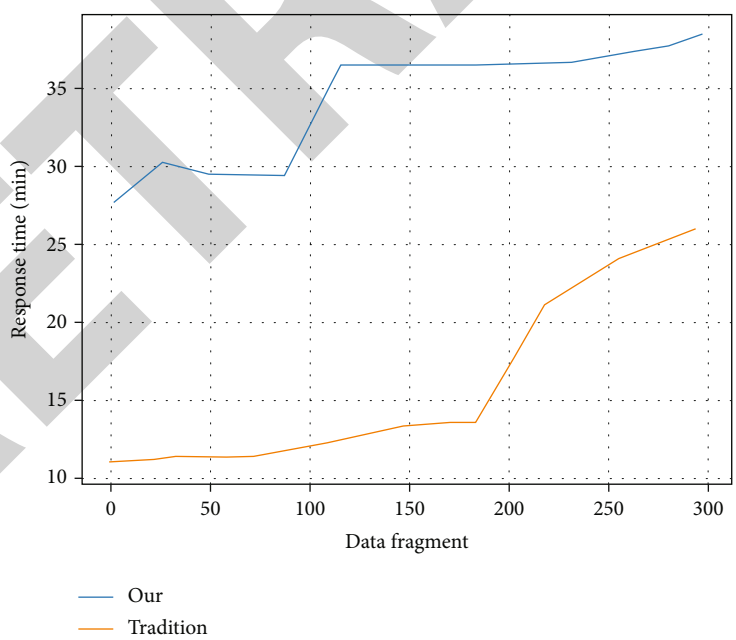


Figure 8: Copy operation response time.

and students, and schools should formulate. After the project is completed, the informatization department should strengthen the training of teachers and students, and the school should formulate policies to encourage teachers and students to apply it, so as to achieve "better use than idle," so that the state's investment in education is most effective.

5. Conclusions

We should further explore teaching evaluation and education management models, track learning data, and integrate multidimensional and accurate assessment of the effectiveness of teaching and learning. In addition, we will make full use of new technologies such as cloud computing, big data, artificial intelligence, and the Internet of Things to build an all-round, whole-process, and all-weather assessment support system; use big data to support the ability to safeguard education management, decision-making, and public services; and to help teaching management and services, which is of constructive significance for the development of the future education management system. Education informatization is an inherent need to achieve new leaps based on historical achievements and an effective way to accelerate the modernization of education. The "Internet + Education" and artificial intelligence will change the way education is produced and reorganise and reengineer the business processes of education. With the perfect combination of education and information technology, there will be a comprehensive reform of the university education management system in the near future.

Data Availability

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

Conflicts of Interest

The author declared no conflicts of interest regarding this work.

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