

Research Article

Research on Real-Time Information Storage and Remote Piano Teaching Based on Bayesian Algorithm

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In recent years, big data has developed rapidly, but there are still some problems. In order to solve these problems, this article has carried out research on big data and integrated it into industrial equipment inspection, and designed a function for data processing. This function is based on the XML system and studies the relationship between the XML system and the database in order to switch between different types of data. At the same time, because of the error of the data processed by the sensor, we decided to improve the Bayesian prediction calculation method in order to improve the accuracy of the data and reduce the error of the data. In the process of extracting key data, the key data collected by the sensor will be transmitted to the cloud platform. This is to realize the free transmission of data on different devices without other forms of interference and hindrance. The processed data will be stored in the monitor or computer for further processing. In order to ensure that the data will not be disturbed or destroyed during the process of saving data, we have designed a data security system, which consists of encryption modules and key cracking modules, and has tested the performance of these modules through a large number of experiments. In order to improve the operating efficiency of the system and to extend the service life, online piano teaching is a part of online education. This article uses music education apps and piano online education to study new ways of piano education in the information age and expounds the combination of intelligent systems and piano education. This has a major impact on future education.

1. Introduction

In recent years, computers and the Internet have become popular and have been involved in all areas of life. This has also promoted the rise of emerging technologies such as the Internet of Things and big data [1]. Although human life has become more and more intelligent, it has also brought many problems. For many problems, such as the leakage or destruction of user information, the original information encryption system has no way to adapt to the development of the times, so we cannot just use the original system to encrypt the information in the cloud computing system. We need other auxiliary equipment [2, 3] and optimize and upgrade the original system. In the process of research, we found that trusted computing can be introduced to solve the problem of information leakage. The principle is to combine trusted computing technology with a data security system, and then design a data model, which is beneficial to increase the confidentiality and security of the information storage

system. Reliability is also conducive to simplifying the calculation process, improving calculation efficiency, and reducing costs. Trusted computing technology can solve the information leakage and signal interference that may occur in the calculation process of big data, and can make the entire system run more efficiently and extend the service life of the system.

In recent years, with the development of online teaching, some problems have also appeared. For example, the quality level of platforms is too wide, and the teaching quality of some platforms is not up to the standard. Some platforms focus on grade examination and speed-up, instead of focusing on improving the ability and level of students. Most of the fast-learning courses are organized for adult students or senior students [4]. This is not just a platform issue but also has a lot to do with students. Many adult students have a certain purpose in learning piano, and they have relatively high learning and acceptance capabilities. At present, China online education platform is developing rapidly, but there is

still a gap compared with Western countries. We need not only to develop emerging technologies such as the Internet and big data, but also to standardize online teaching platforms, integrate the Internet and teaching deeply, make up for the shortcomings of traditional teaching models, and gradually establish a perfect and efficient online piano music teaching platform.

2. Related Work

Some research believes that domestic technologies such as big data and cloud computing have just risen. Although the research process is relatively short, great achievements have been made, and they have been widely combined with other fields to play a greater role [5]. Today, information projects such as integration and data collection have attracted more and more researchers and scholars and have become hot issues. Some research states that the current research focuses on transforming different types of information in order to improve the efficiency of system calculations, and realizes the integration and storage of different types of information. Some research designed an information integration system, which mainly uses big data to perform calculations and processing. On the basis of the Internet, the function of big data information integration is played. At the same time, the storage system is upgraded to improve the confidentiality of information. The processor classifies and stores different information, but in the actual application process, the efficiency is still relatively low. To solve this problem, researchers found that other information storage systems can be used, and data models can also be used in the process of information processing to improve the efficiency of information storage. In addition, you can also use the data integration model of middleware, use the three-tier architecture model, and innovatively introduce virtual databases in data processing to improve data query efficiency. The semistructured VII technology and cross-platform Java technology constitute the processing center [6, 7]. Between the underlying database and the upper application, some research studies describe an efficient information storage technology to realize the storage of all different types of data. However, the structure of this system is relatively simple, data cannot be extracted and transmitted, and other factors may be affected during the storage process. Interference: the information integration method proposed the functions of both computers and sensors, and uses data processing systems and encrypted storage technology to build an inseparable information integration system, which makes different types of data in different environments. It is possible to switch between them. However, using multiple information processing technologies at the same time and introducing them into the same system may consume a lot of energy without using environmental protection and ecological construction. Some research believes that using XMLSchema technology, this technology can realize the transmission of information between multiple devices such as databases, computers, and cloud platforms, and can improve the speed and efficiency of information processing, reduce costs, and provide users with greater convenience.

However, the problem of how to store information for a long time under different environments has not been solved. The method is still very traditional, and the confidentiality of information needs to be improved.

3. Multisource Heterogeneous Data Processing Related Information

3.1. Multisource Heterogeneous Data Integration Technology. In the process of industrial inspection, if too many sensors are used, then it will cause data errors. Therefore, we need to classify the collected information and integrate different types of information according to certain standards. Make the data clearer and help improve the calculation efficiency of the whole process. However, the data and information collected from different computer equipment and different cloud computing platforms are very different, and the amount and variety are huge, which may reduce the speed of data integration. In response to this issue, we are still conducting more research.

3.2. Analysis of Data Integration Mode. Nowadays, the research on integrating different sources of information is mainly divided into three aspects: cloud platform computing system, computer transmission system, and big data storage system.

Cloud platform computing system: process and integrate different information databases, introduce cloud computing platforms into separate information databases, allow cloud computing systems to store data by themselves, and can realize mutual transmission between different devices. However, this system also has some problems, that is, when different types of information and data are transmitted, information leakage may occur and may be affected by other factors, such as the environment, and the operating efficiency of the system may decrease.

Computer transmission system: The computer transmission system is a system for information transmission. This system integrates different types of data into a file through sensors, then the sensors are transmitted to different devices through different interfaces, and the sensors information and data will be encrypted to improve the confidentiality of data.

Big data storage system: The big data storage system integrates all kinds of data on one platform. Although the form of information may change, the storage time is relatively long. This platform can extract key information and data and perform processing, which helps improve the efficiency of the system to process information and reduce costs. Data warehouse architecture is shown in Figure 1.

The information on the big data platform is collected on different devices, and key information is processed and processed to reduce the interference of unnecessary information. After collecting information from different platforms, the information is stored in a computer or other equipment. The use of ETL technology in the storage process can improve efficiency.

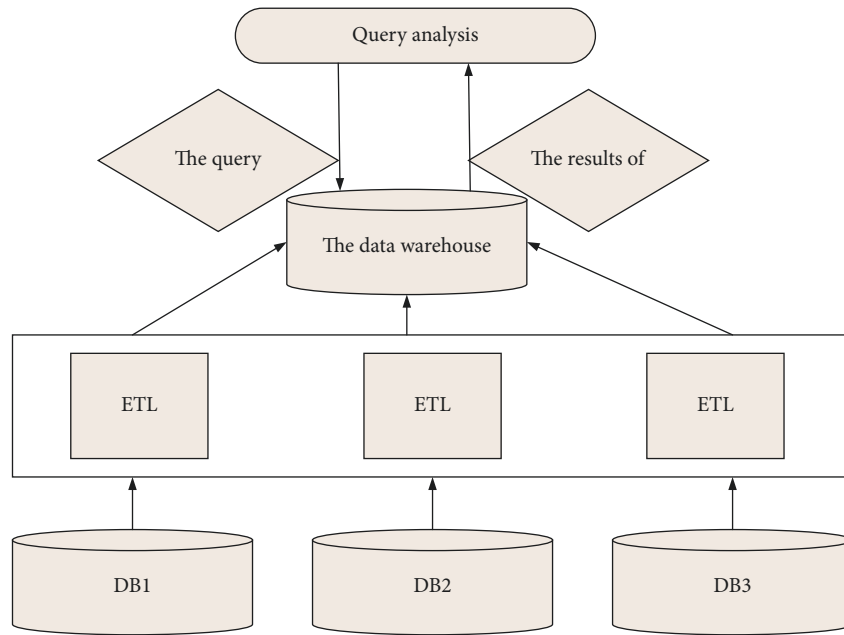


FIGURE 1: Data warehouse architecture.

3.3. *Overview of Real-Time Processing Technology.* The information real-time processing system requires shorter reaction time and higher calculation efficiency of other equipment, because the information in the real-time processing may reduce the efficiency of the current system operation. Therefore, when one of the data is processed for a long time, there is likely to be data leakage or interference with the processing of other information, and even damage the data processed by the system. There may be data leakage or interference with the processing of other information, or even damage to the data processed by the system. To study the integration and processing of different types of information, we must first use the real-time processing system of the real-time storage cloud platform.

The real-time information storage cloud platform mainly stores data in the form of files, but we still need to update and upgrade the encryption processing of key data. On the basis of the initial storage system, the real-time information storage cloud platform uses the encrypted form of the index to first collect the source and content of key data, and then uses the model to perform a series of encryption processing [8]. Because there is no interface connection between the device and the device, the free transmission of data cannot be carried out. We use the index to classify these different sources of information according to the standard and file size. Although this will increase the operating burden of the system, it can be classified after classification. Simplify the subsequent calculation process, so as to achieve a better data encryption effect. In this process, we use B+ index and Hash index. B+ tree index: this index method is optimized and upgraded on the basis of the trigeminal tree index, because each part of the trigeminal tree index can only store one information set. If it is introduced to the real-time information storage cloud platform, these different information sets may be stored in different systems, which may greatly reduce the operating efficiency of the system

and even cause confusion and loss of information [9]. Each part of the B+ tree can store key information, and each part is connected and interoperable, which can realize the free transmission of data and information, which greatly improves the operating efficiency of the system.

Hash index: Hash index mainly categorizes data in cloud computing. Therefore, we need to use a hash algorithm to correspond different data to their respective hash values. The effect of this index method is better than the previous index method, because it will also takes a long time for data to be stored in different modules. Therefore, we use the hash value of the data to realize real-time storage of more data through the hash index, which is less time-consuming and low-cost. Hash index structure is shown in Figure 2.

Because we collect data on platforms that are not used, the amount of information is large and complex, not stable enough, and even interfered by other factors such as the environment. These are problems that we need to consider and solve, and sensors are processing information. There will also be many problems in the process, such as too much information and unstable sensors. The stability of the sensor plays a vital role in the whole process, because there may be errors in the processed information, so we need to integrate different information to reduce errors in the results.

The integration of different types of information is to classify and integrate information and data collected from different devices to obtain clearer and more critical information. We use the upgraded Bayes algorithm to process the collected data, which can reduce the instability of the data, improve the efficiency of data processing, and can effectively filter out unnecessary data [10]. The basic principle of the Bayesian algorithm is to fix the parameters of the data model within a range, and randomly select some variables, and obtain the prior distribution of the parameters in the data model through a large number of experiments. Through these

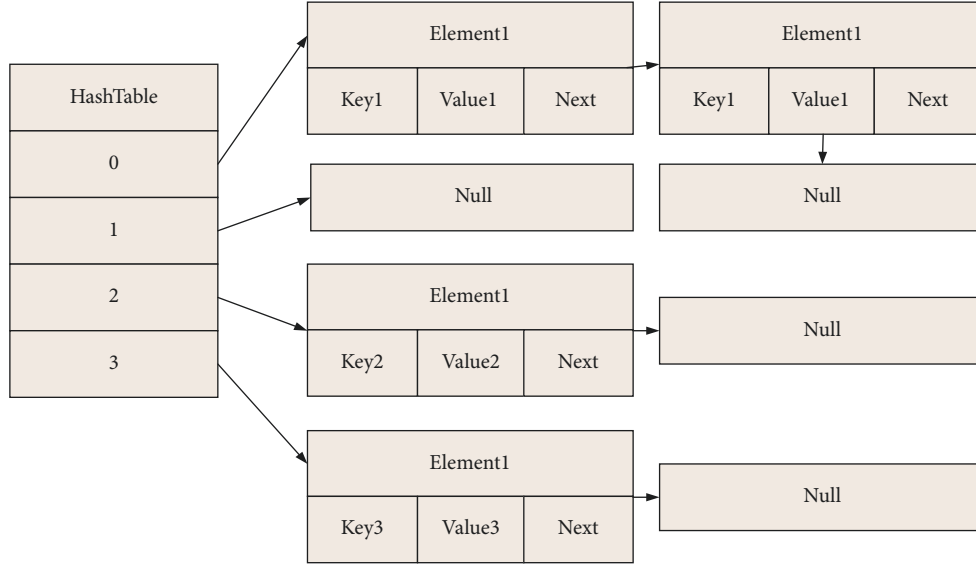


FIGURE 2: Hash index structure.

prior distribution information and variable information, for comparison, the posterior information is obtained by Bayesian algorithm, and then the function is used to calculate the range of the posterior distribution. In short, it is to use the distribution information of the parameters and the variable information to calculate the posterior distribution information through the Bayesian algorithm, and then use the posterior information to predict the index. The Bayesian estimation process is shown in Figure 3.

According to the Bayesian algorithm, it is assumed that the linear function $F(x, \theta)$ of the data set X , θ is the sampled sample, and $p(\theta)$ is the distribution value of θ . If there is a judgment function $d^*(X)$ in the judgment function image D , then we can consider that $d^*(X)$ is the Bayesian value range of θ . $R(d)$ is the maximum value of the judgment function $d^*(X)$. The Bayesian value range is inversely proportional to $p(\theta)$, that is, if $p(\theta)$ is different, then the Bayesian value range of θ is the same. $p(\theta)$ and the square loss function are

$$d(x) = E(\theta|X=x) \int_{\theta} \theta p(\theta|x) d\theta. \quad (1)$$

In this function, px is the posterior range of θ . The optimized Bayes algorithm is different from the original method because the Bayes algorithm combines posterior information and variable information. The Bayesian algorithm can set the parameters in the data model within the reasonable value range of the prior information. The value range of the prior information predicts the variables during the process corresponding to the value range of the posterior information [11]. That is to use variables to correct the previously set parameters. If the information in the X variable concentration is scattered before the prediction, then the value range of X a priori information is $P(X)$. After the Bayesian algorithm calculates the value range of the posterior information of X , Z is obtained, and the Bayesian algorithm calculates the value range of the prior information $P(X)$, $P(Z)$ and the value range of the posterior information. $P(ZX)$, the specific method is as follows:

$$p(X|Z) = \frac{p(Z|X)p(X)}{p(Z)}, \quad (2)$$

$p(Z|X)$ is proportional to the two functions $P(X)$ and $P(Z|X)$, and Z is inversely proportional to X . There is a certain relationship between the maximum value of the posterior information and the minimum value of the prior information and the sum of the judgment function, which can be obtained by the following calculation method:

$$x_{MAP} = \operatorname{argmax} p(X|Z) \propto p(Z|X)P(X). \quad (3)$$

However, because the processed information of the sensor will finally calculate an average value, the sensor data model can make the collected information clearer. By substituting the sample set X , this data model can calculate the value range of Z . This value range is relative to the sensor and can be verified by a large number of experiments. The experiment shows that $P(Z|X)$ conforms to the negative-state distribution. The negative distribution means the distribution of the stability of the inductor:

$$p(Z = z_s|X) = \frac{1}{\sigma_s \sqrt{2\pi}} \exp \left\{ -\frac{(x - z)^2}{2\sigma_s^2} \right\}. \quad (4)$$

The image of the variance can indicate whether the information processed by the sensor is valid. S represents the S th sensor. Assuming that two sensor models are introduced into the above judgment function, it can be calculated by Bayesian function. The posterior distribution of the maximum value is

$$x_{MAP} = \operatorname{argmax} [p(Z = z_1|X=x)p(Z = z_2|X=x)]. \quad (5)$$

$$x_{MAP} = \operatorname{argmax} \left[\frac{1}{\sigma_1 \sigma_2 2\pi} \exp - \left\{ \frac{(x - z_1)^2}{2\sigma_1^2} + \frac{(x - z_2)^2}{2\sigma_2^2} \right\} \right]. \quad (6)$$

It is concluded that

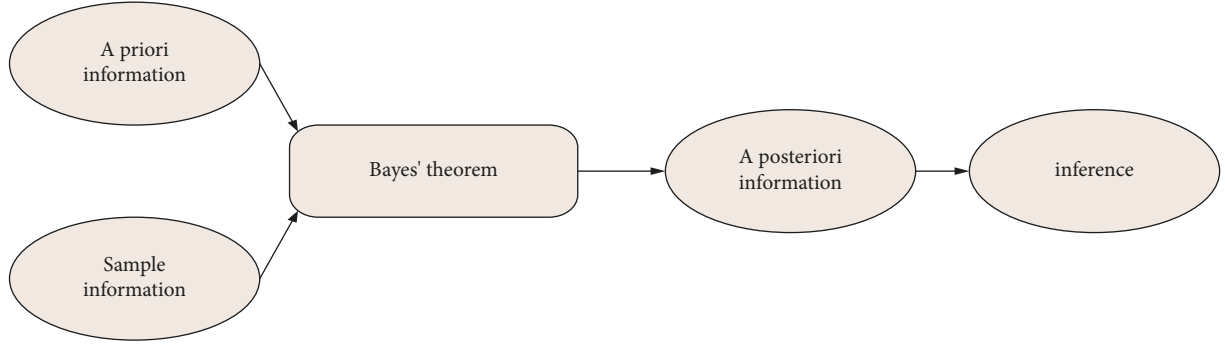


FIGURE 3: Bayesian estimation inference process.

$$x_{MAP} = \frac{\sigma_2^2}{\sigma_1^2 + \sigma_2^2} z_1 + \frac{\sigma_1^2}{\sigma_1^2 + \sigma_2^2} z_2 = \frac{1}{r^2 + 1} z_1 + \frac{1}{1/r^2 + 1} z_2. \quad (7)$$

Two functions are converted to calculate the probability value:

$$\sigma_v^2 = \frac{\sigma_1^2 \cdot \sigma_2^2}{\sigma_1^2 + \sigma_2^2} = \frac{1}{\sigma_1 + \sigma_2 - 4}. \quad (8)$$

In the actual application process, if the sensor has some problems or is affected by other factors such as the surrounding environment, the sensor may get unstable or error information. In order to solve this problem, we have optimized and upgraded the above methods:

$$p(X|Z = z_1, z_2) \propto \frac{1}{\sigma_1 \sqrt{2\pi}} \exp - \frac{(x - z_1)^2}{2\sigma_1^2 Fac} \times \frac{1}{\sigma_2 \sqrt{2\pi}} \exp - \frac{(x - z_1)^2}{2\sigma_2^2 Fac}. \quad (9)$$

The value of Fac is

$$Fac = \left\{ \frac{m^2}{m^2 - (z_1 - z_2)^2} \right\}. \quad (10)$$

It can be seen that after the optimization and upgrade of the above method, we took into account the influencing factors in the environment and called it Fac, where m is the calculated maximum residual value and the optimized algorithm is mainly to solve the information in the sensor, Instability may be able to identify and filter out some unnecessary factors, and then get more accurate and clear calculation results [12]. This article will systematically explain the industrial equipment monitoring technology based on the data model and verify the calculation results of the function.

3.4. Missing Data Estimation Method

3.4.1. Optimize the Parameter Estimation Model. The information set of the cloud computing platform is Y , which includes k subsets. After calculation, we get the average and variance of Y . In order to determine the data model parameters, we built the following function to predict the value of the parameter:

$$f(\varphi) = -\frac{n}{2} \ln(2\pi) - \frac{n}{2} \ln|\Sigma| - \frac{1}{2} \sum_{i=1}^n (x_i - \mu)^T \cdot \Sigma^{-1} (x_i - \mu). \quad (11)$$

When predicting the parameters of the data model, the smaller the function value, the greater the parameter error. It can be seen that we can turn the problem into a problem of selecting the optimal solution under certain constraints and conditions, and the function can be changed to

$$\max_{\varphi} f(\varphi). \quad (12)$$

It can be seen that when the function value is larger, the parameter value error is smaller, and the speed of the optimal solution is faster. The specific calculation process is as follows:

$$P_x(\varphi_i) = \frac{f(\varphi_i)}{\sum_{j=1}^m f(\varphi_j)}. \quad (13)$$

According to the calculation result of the above formula, we can get ia and ib, which are the maximum and minimum values of the i th data set. According to these two values, we can calculate the value range of the parameter as

$$\text{s.t.} \begin{cases} a_1 \leq \mu_1 \leq b_1, \\ a_2 \leq \mu_2 \leq b_2, \\ \dots, \\ a_k \leq \mu_k \leq b_k, \end{cases} \quad (14)$$

The above formula calculates the value range of the parameter. This value range can be used as a standard to judge whether the calculation result is correct. If the calculation result is no longer in this interval, it means that the calculation result is wrong and further calculations are needed. Then, we need to find the most suitable parameter value. First, calculate the average value of jX according to formulas (3)–(5), denoted as \bar{x}_j :

$$\bar{x}_j = \frac{1}{\sum_{i=1}^n \text{Count}_{ij}} \sum_{i=1}^n x_{ij}. \quad (15)$$

In the formula, if the data is wrong, there is

$$\text{Count}_{ij} = \begin{cases} 1, & x_{ij} \text{ is not lost,} \\ 0, & x_{ij} \text{ is lost.} \end{cases} \quad (16)$$

If X_{ij} is missing, perform the following operations:

$$y_{1j} = \frac{\bar{x}_j - a_j}{b_j - a_j}, j = 1, 2, \dots, k. \quad (17)$$

In order to find the most suitable parameters, we then filter the parameter values according to the logistic mapping in formulas (3)–(8):

$$y_{(i+1)j} = \xi \bullet y_{ij} \bullet (1 - y_{ij}) \quad i = 1, 2, \dots, m - 1; \\ j = 1, 2, \dots, k, \quad (18)$$

In the formula, i represents the change speed, K is the predictive index, and its interval is (1), (3). The sequence corresponding to the parameter interval is obtained by formulas (3)–(8). In order to make the sequence correspond to the parameter image, it is necessary to follow the formulas (3)–(9). Perform mapping to calculate the average interval. Then, average the interval to estimate the missing data. From this, the parameter values can be obtained. The specific calculation process is as follows:

$$x_{ij} = a_j + (b_j - a_j)y_{ij}; \\ i = 1, 2, \dots, m; \\ j = 1, 2, \dots, k. \quad (19)$$

3.4.2. Genetic Optimization Process. After obtaining the parameter set, we need to use the predictive function to identify the good and bad parameters. This process consists of three stages: parameter selection, parameter merging, and parameter change. Let cP be the parameter merging speed, select P parameters from the parameter set of size M , and merge them, and then perform the following operations:

$$\begin{cases} \varphi'_i = e\varphi_i + (1 - e)\varphi_j, \\ \varphi'_j = (1 - r)\varphi_i + e\varphi_j. \end{cases} \quad (20)$$

In the formula, e is a value in the range of (1) and (2).

$$x'_{ij} = \begin{cases} x_{ij} + \Delta(g, b_i - x_{ij}), \text{ random}(\bullet) > 0, \\ x_{ij} - \Delta(g, x_{ij} - a_i), \text{ random}(\bullet) < 0, \end{cases} \quad (21)$$

$$\Delta(g, x) = x \left[1 - \rho^{(1 - \delta/G)^g} \right].$$

In the formula, j is a value in the (1,2,...,k) set, after the function operation, a variable value is obtained, G is the kangaroo after the parameter changes, and the value is taken in the range of (1), (2).

3.4.3. Chaos Disturbance of Excellent Parameters. Genetic algorithm is easy to cause errors in function calculation and the speed of function selection is too fast. Therefore, we decided to use the predictive function to interfere with the

inferior parameters in the parameter set, so that the genetic algorithm can find the optimal solution and reduce the change speed. Interfere with M inferior parameters to avoid generating new parameters. Assuming that the function value of the current inferior parameter is mf , then there is the following formula:

$$\mu_1^* = \{x_{i1}^*, \dots, x_{ij}^*, \dots, x_{ik}^*\}, \\ x_{ij}^{**} = x_{ij}^* + \alpha \cdot \phi_j, \\ j = 1, 2, \dots, k. \quad (22)$$

Through the above algorithm, continue to interfere with the retained inferior function, which can speed up the determination of the optimal function value and reduce the replacement efficiency. Assuming that it is changed i times, f_i^* is the function value of the excellent parameter. When equations (3)–(14) appear, the calculation ends, and the parameter of the function value f_i^* is the optimal parameter.

$$|f_i^* - f_{i-1}^*| < \varepsilon. \quad (23)$$

4. Design of Data and Information Security Storage Method under Cloud Computing Environment

In the era of big data, because the problem of information leakage occurs from time to time, information encryption is particularly important. Information encryption is to carry out confidential measures for key information, which is mainly composed of multiple steps such as key generation, key use, and key cracking. It is worth noting that information is the inverse of the encryption operation when the key is cracked. Operation, which means that this process requires the same key to crack the information, and the information can be stored in the file after being encrypted [13–15]. The information security encryption system designed in this paper introduces the principle of block cipher. Generally, the block cipher encrypts the unencrypted information with an algorithm, and then puts it in the folder in order. This sequence is the encrypted information collection. Data encryption module operation process is shown in Figure 4.

4.1. System Performance Test Analysis. The system performance test analysis can compare the ECC algorithm used in the big data information encryption system of this article with other encryption algorithms in order to get the advantages and disadvantages of different algorithms. We have simulated in MATLAB to compare the ECC algorithm and the RSA encryption algorithm and the DSA encryption algorithm is used to test the encryption effect. The standard is mainly composed of data stability, encryption efficiency, and file size.

4.2. Security Test Analysis. The stability of information storage can be shown by the anti-interference of the algorithm. Therefore, we compared the anti-interference effects

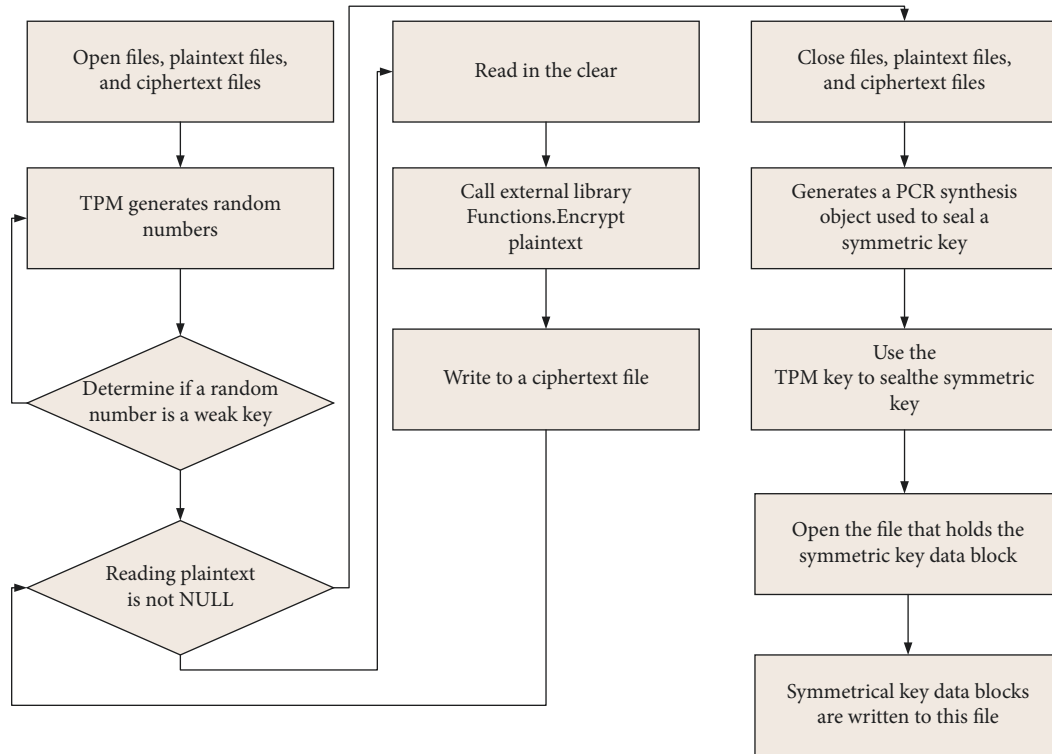


FIGURE 4: Data encryption module operation process.

of the ECC algorithm, the RSA encryption algorithm, and the DSA encryption algorithm, and the anti-interference performance is also related to the size of the key. There are relationships, and so we compared the key size of the encryption algorithm in MATLAB. Due to the large amount of calculation of the elliptic curve encryption algorithm, the calculation amount of the ECC algorithm changes with the change of the key, and the change is relatively large, but the calculation amount of the RSA algorithm and DSA algorithm is basically not affected by the change of key. Safety comparative analysis results are shown in Table 1.

4.3. Storage Space Test Analysis. Studies have shown that when the key size of the RSA encryption algorithm is 173G, its encryption effect is the same as that of the EEC and DSA encryption algorithms with a size of 1231G; when the key size of the DSA encryption algorithm is 134G, the key size is RSA with 1091G. The encryption effect of EEC algorithm is the same. Therefore, we can see that the DSA encryption algorithm has the smallest key size and the highest efficiency under the same encryption effect.

5. Remote Piano Music Teaching

5.1. Network—New Education Model. According to CNNIC’s 30th Internet Report, before May 2014, there were already 481 million Internet users in China, an increase of 25.45 million in half a year. The Internet penetration rate is 45.2%. ②The average daily online time of the Chinese people is about 10 hours. The Internet is an emerging media that has developed after the traditional media such as

TABLE 1: Safety comparative analysis results.

ECC algorithm (bit)	RSA algorithm (bit)	DSA algorithm (bit)
116	533	533
129	776	776
162	1019	1019
209	2103	2103

Studies have shown that when the key size of the RSA encryption algorithm is 173G, its encryption effect is the same as that of the EEC and DSA encryption algorithms with a size of 1231G; when the key size of the DSA encryption algorithm is 134G, the key size is RSA with 1091G. The encryption effect of EEC algorithm is the same.

magazines, TV, and radio. In recent years, mobile phones have also been continuously developed. Basically, one mobile phone is in hand. According to big data, statistics show that there are about 135 million teenagers with mobile phones. The mobile phone usage rate of Chinese people exceeds 65%, most of which are concentrated in young adults aged 12–45. From the perspective of academic qualifications, they are mainly concentrated in middle and high schools. The Internet has multiple purposes such as real-time calls, survey data, news newspapers, and online teaching. This shows that the Internet has become the most important way for us to live, study, work, and play. Nowadays, the Internet is also integrated into the teaching field. With the enhancement of young people’s learning awareness, the role of the Internet in teaching has exceeded the role of entertainment and recreation, and this has enabled teaching to break through the limitations of time and space. The CEO of Microsoft said that the Internet will be mainly used for teaching in the next six years to meet the needs of

the knowledge economy era. Online education has been developing for decades, from correspondence education, broadcasting education, etc., to the use of Internet, big data, and other methods for teaching, increasing the way of education. As of 2007, mainly Ivy League schools, about 15 colleges have started online open courses.

Although China's online education started relatively late, it has made considerable achievements. Hongcheng Education is the largest online education platform in China with the longest existence. This platform was established in 1998. The service targets were only for adults, and later began to cooperate with various universities. By 2006, 102 online education platforms were merged to improve the higher education system. It was listed on the New York Stock Exchange in 2008 and was the first online education platform to be listed in China. Currently, there are more than 98 million users.

5.2. Overview of Online Piano Music Education. In recent years, online piano music teaching platforms have sprung up. The characteristics of these platforms are that they can provide some effective information with the changes of the times. Users can know the music resources in China and around the world and will hold regular music academic discussions. Meetings, various trainings, and competitions are conducted in order to show the style of music talents. The purpose of the online music teaching platform is to unite piano teachers, conduct piano music seminars, and reform the form of music education. Pianists exchange experience and research results, compile piano teaching materials, and conduct joint creations. On the basis of cultural inheritance, promote exchanges and cooperation with other countries, absorb the essence, and pave the way for the development and education of China's piano industry.

6. Conclusion

The principle of different information processing systems is to integrate and classify data extracted from different platforms through algorithms and other methods, and then save these data on the cloud computing platform. We have conducted research on information preservation in the context of big data, combined with trusted cloud computing to develop information security preservation technology, focusing on information encryption processing, key cracking, and other modules, and verified the results through a large number of experiments. The key has been optimized and upgraded to realize the efficient operation of the system. With the popularization and development of the Internet, this has brought a huge impact to traditional offline education forms. Schools are no longer the only way of teaching. Online teaching breaks the limitations of time and space. In order to meet the needs of the knowledge economy era, China has gradually established a perfect and efficient online piano teaching platform. Develop personalized teaching plans for students of different ages, different occupations, different educational backgrounds, and different identities, and use the rich teaching resources at home and

abroad to train students, which has promoted the development of piano education in China, and even changed the Chinese teaching model.

Data Availability

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

Conflicts of Interest

The author declares that there are no conflicts of interest.

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