Research Article

Database Development Based on Deep Learning and Cloud Computing

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In this research, the author develops databases based on deep learning and cloud computing technology. On the basis of designing the overall architecture of the database with the distributed C/S mode as the core, use J2EE (Java 2 Platform, Enterprise Edition) as the development tool, apply Oracle server database, extract data features with in-depth learning technology, allocate data processing tasks based with cloud computing technology, so as to finally complete data fusion and compression. Finally, the overall development of the database is completed by designing the database backup scheme and external encryption. The test results show that the database developed by the above method has low performance loss, can quickly complete the processing of subdatabase and subtable, and can effectively support the distributed storage of data.

1. Introduction

A database is a data warehouse that organizes, stores, and manages data in a structured manner. It is a repository of vast volumes of data that have been maintained in servers for a long period of time and are organized, shareable, and universally managed [1]. The database has a vast storage capacity, allowing millions, tens of millions, and high numbers of records to be stored. The database, on the other hand, does not hold information at will. There are several rules to follow; else, the query’s performance will be quite low.

Databases have seen the creation of hierarchical databases, mesh databases, and relational databases, as well as the rapid advancement of database technology in all aspects, throughout their history. Relational databases, in particular, have emerged as the most important database product [2]. Since the 1980s, practically all new database products from database vendors have supported relational databases, and even some nonrelational database systems offer relational database interfaces. This is primarily due to the fact that traditional relational databases are superior at managing and storing relational data. Relational databases are becoming more insufficient to fulfill the demands of cloud computing and the big data age. This is due to the fact that databases are increasingly being used to store and handle semirelational and nonrelational data. Simultaneously, the emergence of new technologies such as distributed technology places new demands on database technology, resulting in the birth of an increasing number of nonrelational databases. In terms of design and data organization, this database differs significantly from standard relational databases. They prioritize high concurrent database data reading and writing, as well as storing large amounts of data; this type of database is commonly referred to as a non-SQL database. In some classic fields, the traditional relational database still has a lot of life [3].

Database technology is the process of processing large amounts of data in a database using the database’s architecture and storage mode, as well as appropriate ideas and technical tools. The database’s primary goal is to keep the system running smoothly and efficiently. Simultaneously, it may help serve user needs, analyze and investigate database building concepts, and lay the groundwork for software design. The analysis work is carried out across the database’s mutual features in order to gradually establish common data entities and then finish the entity transition as per the unique application environment [4].
With the advancement of current science and technology, computer program design now includes an increasing number of parts and contents. The quality of database design is directly related to the operation effect of computer software and then affects the actual experience of users [5]. Therefore, in the process of database design, staff should fully realize the importance of database development, strictly abide by the relevant principles of database design, improve the scientific rationality of computer software design, and give better play to the application value of databases.

The authors state in [6] that traditional database systems have issues such as weak expansion ability, small scale, low technical level, and imperfect function, and that they are severely out of step with the Internet’s quick information transmission and storage capacity. Therefore, it proposes the development of a web information database system under the architecture of Internet of Things. Combined with the development of network database technology at home and abroad, this paper analyzes its special data, system function, and system structure. According to the operation process of web information architecture, the information network database is divided into ordinary users and system administrator users, and each module is designed. Design the database table structure, complete the background program, build the index, and complete the development of the system. The authors of [7] believe that because embedded devices have limited resources, this research employs Qt [8] and MySQL to realize database development, in order to overcome the problem of huge databases using more resources. The QtSql module provided by Qt realizes the association of Qt database applications, adopts MySQL lightweight database, supports Windows, Linux, and other operating systems, and provides ODBC interface. Using Qt development platform, through qsql module and related database drivers in Qt, create application-oriented database system development, carry out database interactive operation through SQL statements, and then transplant it to arm cortex-a8 development board through cross compiler, so as to realize the design and development of embedded database system. The first section of [9] discusses the features of a database system that should be addressed by an efficient, highly reliable, highly available, and adaptive database system, such as database operation and maintenance, data storage, and query optimization. Secondly, the possible challenges in the combination of machine learning algorithm and database technology are discussed, including less training data, long training time, limited generalization ability, and poor adaptability. Then, it summarizes the current situation and specific technology of the combination of database technology and machine learning.

The internal law and interpretation level of training sample data is referred to as deep learning. The knowledge gained during the learning process is extremely useful in interpreting data such as text, image, and sound. Its ultimate goal is to enable machines to analyze and learn in the same way as humans do, and to recognize characters, images, sounds, and other data. Cloud computing is a type of distributed computing in which a large data processing program is fragmented into countless little programs and then processed and evaluated by a system made up of several servers via the network “cloud.” The results are obtained by these little programs, which then return them to the users. At this point, the cloud service is more than just a type of distributed computing: it is the consequence of a convergence of computer technologies such as utility computing, distributed computing, load balancing, network storage, hot backup redundancy, parallel computing, and virtualization [10]. Therefore, in the technology of traditional database testing technology, this study designs the database development process based on deep learning and cloud computing technology.

2. Design Principles of Computer Software Database

(1) Detailed planning shall be carried out in the design preparation stage. Because the database plays a vital role in the operation of computer software, when developing the database, we should fully consider the functions to be realized by the database, plan enough time for database development, and ensure that the completed database can meet the application requirements of computer software.

(a) In the development preparation stage, we should fully grasp the specific needs of users, which is the basis of database design. We should ensure the business application needs of software development and give better play to the application value of software.

(b) In the process of software development, we should not only look at problems from our own perspective, but strengthen the information exchange with users. When users ask questions, we should give answers in time and adjust relevant design details. At the same time, the database development work can be decomposed to ensure that each development link can meet the user needs.

(2) Be consistent with the software development plan. When developing the computer software database, we should also examine the computer software from the overall level, explore the specific functions to be realized in each link, and ensure that the database development is consistent with the computer software development. In the process of computer software development, it should be ensured that the designed tables and fields can play a role in practical application. At the same time, when developing the database, we also need to fully understand the development purpose, ensure that the development of the database corresponds to the functions of the software, and ensure that there is a close relationship between the designed database and various software.
functions. When developing the database, it is necessary to make corresponding contact with the table to make the database and application have good unity. Finally, we should pay attention to the correlation between the overall design and local design of the software and give full play to the role of the database in the application of the software [11].

(3) Pay special attention to the efficiency of computer software functions. Database development covers many contents. In the actual development process, we should scientifically evaluate the proportion of each database function, so as to scientifically plan the storage space, strengthen the data calculation level, and further improve the operation efficiency of computer software. In the development process, in order to effectively identify the tables with large capacity, the coarse-grained design method is applied to the design, and the tables with large amounts of data are planned scientifically. During the long-term use of computer software, some fields will produce redundancy, resulting in the reduction of available data storage space, which will lead to the waste of database storage resources. In order to solve this problem, small and weak tables can be used for the storage of large amounts of data, so as to reduce redundancy.

3. Research on Database Development Based on Deep Learning and Cloud Computing

3.1. Overall Architecture Design. The design basis of database architecture is a distributed C/S model, the foreground language adopts JavaScript+CSS+HTML, and the database communication and user operation analysis language selects PHP. The distributed database architecture consists of four layers: file system, database, middleware, and browser. The overall database architecture is shown in Figure 1.

3.2. Database Development Tools. In the process of database development, the selected development tool is Java 2 Platform, Enterprise Edition (J2EE) [12]. J2EE is the new standard technology for designing enterprise applications that run on servers, and it was created with this in mind. J2EE includes APIs that allow developers to design workflows and access resources like web services or databases. The architecture of J2EE is shown in Figure 2.

J2EE includes the following technologies and components: Java technology, servlet technology, JSP technology, and EJB components. Among them, Java technology can solve the heterogeneous problem in database construction, realize the data information exchange and program exchange of the database through removable code, and enhance the operation interactivity of hypertext [13]. Servlet technology can realize remote dynamic loading in database construction. It is usually integrated into the server and executed through the server. Servlet needs to be written through Java technology, so it has all the advantages of Java technology, including security and portability.

3.3. Server Selection. In the process of developing the database, the selected server type is Oracle server, which can provide a series of effective schemes, as demonstrated in Table 1.

3.4. Database Processing

3.4.1. Data Feature Extraction Based on Deep Learning. Deep learning is a branch of machine learning, and its essence is a pattern analysis process. Deep learning mainly involves three kinds of methods, namely, convolutional neural network, self-coding neural network, and deep confidence network [14]. Therefore, this study uses deep learning technology to extract data features, which lays a foundation for subsequent data processing. Based on the construction of deep learning network, combined with the training of neural network, we preprocess the data, use dynamic adaptive selection of target candidate box, and extract data features.

Firstly, the convolution neural network technology is used to construct the deep learning network framework. Its advantage is that it can directly achieve the purpose of neuron weight parameter sharing in all levels of the network without extracting the display features. The deep learning network model based on convolutional neural network technology consists of 6 layers, and its structure is shown in Figure 4.

In Figure 4, the first layer of the constructed deep learning network is the data input layer, and all data to be processed can enter the next layer only after the corresponding preprocessing operation is performed in the input layer. The second layer is the first convolution layer, which is used to obtain the same video image features. The third layer is the sampling layer, which is used to extract and compress the target behavior features. The fourth layer is the second convolution layer, which combines the second convolution layer with the subsequent hidden layer and realizes feature output through the output layer.
(1) Input layer. The input layer is the starting layer of the deep learning network, which can perform preprocessing operations on the data, including deaveraging and normalization, and finally obtain the effective data to be measured [15]. The input layer contains only one data output operation port. Only after the preprocessing of the input layer can the data be output to the first volume layer. In this process, the deep learning network refers to the output data information as the characteristic graph and takes the characteristic graph of the data as the network structure layer.

(2) Convolution layer. The convolution layer is the core layer of the deep learning network. With the help of the special convolution core structure, the convolution operation is performed on all the received data, and the convolution results are output in the form of a feature graph, so as to extract the data features. The convolution layer in the deep learning network uses the convolution kernel to perform data transmission and extraction. It has the advantages of accurate extraction and high efficiency. It is very important in the processing of deep learning networks.

(3) Pool layer. The function of the pooling layer in deep learning networks is to sample the input data samples, so as to effectively reduce the invalid feature quantity and over fit the textile data. However, a too large size will cause the loss of information in the process of pooling operation. Generally, the available pooling methods are mean pooling method and maximum pooling method. When performing the pooling operation, the mean pooling is to calculate the mean value of the elements in each region and use the calculation result as the output eigenvalue. The maximum pooling is to use the maximum value of each element in the region as the output eigenvalue. The two pooling methods can correctly and effectively extract the effective eigenvalues of data samples.

(4) Hidden layers. The hidden layer in convolutional neural networks is a general term. All layers except the input layer and output layer are contained in the hidden layer. However, the hidden layer cannot communicate directly with the outside world. The hidden layer can convert the information input into a format acceptable to the output layer, and the output layer can also convert the information in the hidden layer to any scale.

Based on the above analysis, firstly, the deep learning network is pretrained layer by layer in an unsupervised way to help the deep neural network effectively mine data features, and then, the supervised learning method is used to adjust the deep learning network.

Firstly, the first layer is trained with data samples to obtain the offset parameters and connection weights of the first layer. According to the noise reduction automatic encoder, the DAE model can learn the structure of the data itself, so as to obtain more expressive features in the data and so as to complete the learning of the first layer. Then, the output of the first layer is used as the input data of the second layer, and the data of the second layer is trained to obtain the bias parameters and connection weights of the second layer. According to the above process and so on, the final data reconstruction features are obtained after layer by layer learning of the data.

Suppose the training sample set of the data is \( \{ x_n | n = 0, 1, 2, \cdots, N \} \), where \( n \) is the serial number of the input data training samples and \( N \) is the total number of the input data.
training samples. Then, the training samples of the data are transformed into coding vectors by using the coding function. The coding function is $F$, and the coding vector is $S^n$. The process is shown in the following equation:

\[ S^n = F(x^n) = \kappa \omega x^n + b, \quad (1) \]

where $b$ is the offset parameter of the error data in the coding network, $\omega$ is the connection weight, and $\kappa$ is the activation function. Then, the obtained encoding vector is inversely converted into data by the decoding function and reconstructed into $\tilde{S}^n$, as shown in the following equation:

\[ \tilde{S}^n = D(S^n) = \kappa (\omega S^n + b), \quad (2) \]

where $D$ is the decoding function. On this basis, the minimized $S^n$ and $\tilde{S}^n$ reconstruction errors $e(S^n, \tilde{S}^n)$ are used to complete the network training, as shown in the following equation:

\[ e(S^n, \tilde{S}^n) = \frac{1}{N} \sum_{n=1}^{N} |S^n - \tilde{S}^n|^2. \quad (3) \]

According to the above process, the error will propagate from top to bottom when training the data samples, so we should use the deep learning network to fine tune it to avoid the error of data during training.

**3.4.2. Data Processing Task Allocation Based on Cloud Computing.** Cloud computing is an efficient computing model, which mainly includes resource computing and resource storage. The data service center of cloud computing is mainly responsible for providing users with computing, storage, and other related services, mainly composed of servers and software resources [16]. An effective resource allocation strategy needs to comprehensively consider the current virtual machine load and network conditions, so that

<table>
<thead>
<tr>
<th>S. #</th>
<th>Effective schemes</th>
<th>Support</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Java, object-oriented, and other new technologies</td>
<td>It has built-in OLAP, data storage, data mining, and other functions and has Java engine, XDK, XdB, and other XML support.</td>
</tr>
<tr>
<td>2</td>
<td>File management system</td>
<td>It can efficiently and easily manage the data, index, protect, search, and store the relevant data documents, support the transmission of dynamic content through streaming media, and support the unified search of different information warehouses.</td>
</tr>
<tr>
<td>3</td>
<td>Multimedia support</td>
<td>It has powerful multimedia processing functions such as operating system, picture, video, audio, and web connection.</td>
</tr>
<tr>
<td>4</td>
<td>Replication capability</td>
<td>Supports the replication and change of site scheme and data and supports scalable replication technology.</td>
</tr>
<tr>
<td>5</td>
<td>Distributed system</td>
<td>It provides a distributed network environment, which can combine data on different computers to form a logical database, and all users can access the database.</td>
</tr>
<tr>
<td>6</td>
<td>Portability</td>
<td>It can be applied to other systems or platforms.</td>
</tr>
<tr>
<td>7</td>
<td>Good security</td>
<td>Provides security functions to monitor and restrict data access for easy management.</td>
</tr>
<tr>
<td>8</td>
<td>High availability</td>
<td>Failure or data backup is difficult to interrupt its use status, and the working time is long.</td>
</tr>
<tr>
<td>9</td>
<td>Connectivity:</td>
<td>It can share data with different systems or platforms.</td>
</tr>
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Table 1: Series of effective schemes by Oracle server.
the resources in the database can play a full role, so as to improve the resource utilization and reduce the total task execution time.

Suppose the database task set is \( Y = \{y_1, y_2, \cdots, y_i, \cdots, y_n \} \) and the virtual machine resource set in the database is \( V = \{v_1, v_2, \cdots, v_j, \cdots, v_m \} \), where \( y_i \) represents the \( i \)-th task and \( v_j \) represents the \( j \)-th virtual machine resource. Task allocation is to allocate \( i \) tasks to the \( j \)-th virtual machine by using a reasonable algorithm. Assuming that the expected execution time of the \( i \)-th task in the \( j \)-th virtual machine node is \( t(i, j) \) and the earliest start execution time is \( t_0(i, j) \), the expected completion time of task \( i \) is shown in the following equation:

\[
T(i) = t(i, j) + t_0(i, j). \tag{4}
\]

In the process of cloud computing task allocation, tasks need to be classified in combination with QoS parameters [17]. Assign more appropriate tasks according to different needs. QoS parameters can be divided into the following forms:

1. **Memory**: if the user has high requirements for computer memory during calculation, the memory parameters of QoS need to be given priority.
2. **Network bandwidth**: when the network bandwidth has a great impact on users, multimedia needs to be used for data transmission. At the same time, the network bandwidth parameters of QoS are given priority, and data transmission needs to be carried out through multimedia.
3. **Cost**: when the price problem has a great impact on users, the cost parameters of QoS need to be given priority.
4. **Completion time**: if the user has requirements for the task completion time, it is necessary to carefully consider the QoS completion time parameter to ensure the rapid execution of the task.
5. **Network delay**: if users have high requirements for real-time performance, it is necessary to avoid network delay in the process of practical application. At this time, it is necessary to carefully consider the network delay parameters of QoS to better meet the needs of different users.

According to the above QoS parameter classification, combined with the characteristics of cloud computing resources and QoS parameters, task classification is effectively realized.

### 3.4.3. Data Fusion and Compression Based on Cloud Computing

The essence of data fusion is automatic association and feature extraction of data through algorithm framework [18]. The process of data fusion technology designed in this study is shown in Figure 5.

Data fusion is divided into three fusion levels according to multiple characteristics and fusion domains of observation targets, which constitute the structural model of data fusion. The three levels of fusion are data layer, feature layer, and decision layer. The data layer is the basis of data fusion. The fusion of this layer mainly uses the direct calculation method to extract the feature state from the data source, which is closer to the real value of the collected data, but the requirements for the types of data that can be analyzed and integrated in the data layer are single. The feature layer belongs to the middle level fusion, which mainly extracts the feature phasor, makes correlation analysis with the data layer, and obtains the feature phasor that plays a decisive role in judging the state and identifying the pattern. The decision-making level is the highest and can make relevant decisions by using the relevant phasors of the decision-making level.

On the basis of data fusion, this research designs a three-stage data transfer compression storage method to realize the high-density storage of data. The specific steps are as follows:

1. Firstly, the data is critically segmented to obtain the minimum particle in the data information center. According to the particle transmission characteristics, the fitness of the genetic function of the data carrying code can be calculated as follows:

   \[
   f\left(z_{(c,u)}\right) = \left(z_{(c,u-1)} - z_{(c,u)}\right). \tag{5}
   \]

   In Equation (5), if the fitness function of the particle at the \( c \)-th information node under the influence of the minimum interference factor at time point \( u \) is \( f(t_{(c,u)}) \), the function quantities of the particle at the \( c \)-th information node at time point \( u - 1 \) and time point \( u \) are \( z_{(c,u-1)} \) and \( z_{(c,u)} \), respectively.

   After setting the time amount and adaptation function of the data amount, the data compression rate can be calculated according to the influence probability value of the redundant data amount. In order to more accurately describe the compressed storage rate under high-speed transmission, Boltzman algorithm [19] is used to complete this part of the calculation. The fusion genetic nodes in the process of information compression are calculated through the transmission.
relationship between parents and children in the Boltzman algorithm. The specific steps are as follows: make the data flow into a group of aggregates that meet the set adaptation parameters, and the number of adaptation lines is described by the form of a Boltzman dynamic adaptation threshold. The calculation relationship of the description function is as follows:

\[ \mu(z_{(c,u)}) = r^{\partial r}, \tag{6} \]

where \( \partial \) represents the adaptation threshold of the data stream aggregate, \( \mu(z_{(c,u)}) \) represents the Boltzman variable, and \( r \) represents the influence coefficient of the compressed storage state. In the process of compression, part of the compressed information constitutes the child information composed of data storage density, and the amount of data per unit storage space increases significantly compared with the parent information. In this state, the density function of data compression space storage can be described as follows:

\[ Q = \max \left\{ 1 - r^{(1+n-N)p} \right\}, \tag{7} \]

3.5. Database Backup Scheme Design. In this section, we will build a multilevel and all-round database backup scheme.

Firstly, the hardware fault is prevented by hardware backup, and the data logic damage caused by human disoperation or software fault is solved by the combination of hardware fault tolerance and network storage backup. In this way, the multilevel protection of the database is realized to prevent the logical and physical damage of the database. Secondly, the database of each subsite is backed up locally, and two copies of conventional data are backed up, one of which is stored in the production center to ensure the query recovery and normal recovery of data. The other is transferred to different place for storage to ensure data recovery after a disaster. In addition, historical archived data needs to be stored in different places to ensure the effective audit and reliable recovery of historical business data [20]. Then, set the centralized management function, and the system administrator can uniformly manage the whole network backup strategy through the centralized management tool. In this process, it is also necessary to set the full-automatic backup function to automatically backup the data on a regular basis. Finally, build the backup index and build the online index for each backup, including the global index and backup index of the subsite database. When users need to recover the data, they can complete the data recovery through the online index to ensure the integrity and consistency of the data [21].

In addition, multilayer hierarchical storage management is implemented through tape, erasable magneto-optical disc, and hard disc, and the key data of the database is backed up separately. In case of disaster, the database is quickly restored by using the key data [22].
3.6. Design of Encryption Method Outside Database. The database data is encrypted by using the encryption method outside the database, so that the decryption and encryption process occurs outside the DBMS, and the ciphertext is managed through the DBMS. In the encryption method outside the library, the decryption and encryption process can take place on the client or through the encryption server. Table 2 presents the characteristics of encryption outside the library.

The schematic diagram of this encryption method is shown in Figure 6.

4. Experiment and Analysis

In order to verify the practical application performance of the database development method based on deep learning and cloud computing, the following experimental process is designed.

4.1. Experimental Method. The experiment takes the Roma connect dataset as the object. Firstly, a cloud platform for testing the performance of the database is designed. A total of 8 servers are configured on the platform. The specific configuration is shown in Table 3.

The network topology of the cloud platform built in the experiment is shown in Figure 7.

Based on the test platform, the performance of the database development method based on deep learning and cloud computing designed in this study is tested, including single machine performance loss, subtable speed, subdatabase speed, and distributed storage capacity.

In order to enrich the experimental data, the traditional database development method based on Internet of Things architecture and the database design method based on an embedded system are compared, and the experimental data are compared and deeply analyzed.

4.2. Results and Analysis

4.2.1. Single Machine Performance Loss. Firstly, test the single machine performance loss of the database to obtain the experimental data of single machine performance loss of the database under different methods. The specific results are shown in Table 4.

By analyzing the data in Table 3, it can be seen that the database development method based on deep learning and cloud computing can quickly realize the optimization of object sentences after the number of online processes reaches 128, while the two traditional methods can realize basic nursing only after the number of threads reached 8192, which proves that the speed of object sentence
 optimization of these two databases is slow. Moreover, the database development method based on deep learning and cloud computing has low performance loss under low parallel distribution.

4.2.2. Submeter Speed and Subwarehouse Speed Test. Select the data sources corresponding to the two nodes, use the database constructed in this paper to configure test1 and test2 for the subdatabases corresponding to the two data sources, perform subdatabase tests on them, and obtain subdatabase speed data.

At the same time, the test tables test.t1 and test.t2 are configured in the two databases, and the subtable test is implemented to obtain the subtable speed data. The test data of submeter speed and sublibrary speed are shown in Figure 8.

By analyzing the contents shown in Figure 8, it can be seen that the database development method based on deep learning and cloud computing designed in this study can quickly complete the database and table processing, which shows that it has good database and table performance.

4.2.3. Data Storage Capability Test. Test the data storage performance of database development methods based on deep learning and cloud computing. In this test, the data sources corresponding to the three nodes are selected. In the subdatabase corresponding to the three data sources, the test table test.t1 is directly configured in the first subdatabase, and the test table test.t2 is configured in the second subdatabase, so as to obtain specific test results, as shown in Table 5.

The results reflected in Table 5 show that the database development method based on deep learning and cloud computing designed in this study can effectively support the distributed storage of data, indicating that the design method has realized the design expectation.

5. Discussion

Generally speaking, database development is the general term for the design and development of database management systems and database application software. It is mainly used to realize data operation and maintenance, participate in the optimization and solution of the database production environment, etc. Generally, database development needs to go through the design and development of database system and database application software. Therefore, like the process of software development, it will cover four stages: requirements, design, programming, and testing.

In the era of big data, the application scope of databases is very wide. Therefore, the importance of database development is self-evident. In the process of developing the database, the following principles of necessity should be kept in mind:

1. Reduce maintenance costs and strengthen resource utilization. Database development is an extremely important part of computer software design. Therefore, in the process of database design, we must explore the important influencing factors in computer design from different angles and levels, such as the specific application environment of software, the ideas of developers, and the professional level of developers. These factors will have a great impact on the quality of database development. At the same time, during the development of some computer software databases, many parameter sets are unreasonable and unscientific, which virtually causes great difficulty in later maintenance and consumes more human and material resources, which is not conducive to improving the utilization efficiency of resources. Therefore, when developing computer software databases, the staff must face the database design ideologically, fully realize the necessity of database development, and prevent greater losses.

2. It helps to improve the operation efficiency of computer software. The quality of database design is directly related to the operation quality of the computer system. In the actual process of database development, we should not only meet the operation standard of computer software but also have a high matching degree with the computer system itself, so as to ensure the stable and orderly operation of the computer system. An excellent database design can accurately retrieve the required information resources in a very short time after receiving the command sent by the computer, so as to improve the running speed of the computer.

3. Reduce the probability of computer software problems. In the process of database development, the staff can neither fully understand the specific functions to be realized by the software nor scientifically and reasonably calculate the size of the database,
because the database development process is very cumbersome; it is easy to cause that the statistical function of the computer software system cannot be used normally during the actual operation, resulting in calculation problems. When developing the database, we should also scientifically design the log information, so as to avoid the wrong operation of users in later use, and correct it in time according to the log information to ensure the normal use of the database function.

6. Conclusion

In order to effectively realize the management and application of big data, this research develops the database based on deep learning and cloud computing technology. On the basis of designing the overall architecture of the database with the distributed C / S mode as the core, we use J2EE (Java 2 platform, Enterprise Edition) as the development tool, apply Oracle server database, extract data features with in-depth learning technology, and allocate data processing tasks with cloud computing technology, so as to finally complete data fusion and compression. Finally, the overall development of the database is completed by designing the database backup scheme and external encryption. According to the experimental test results, the database developed by this method has low single machine performance loss under low parallel distribution, can quickly complete the processing of subdatabase and suitable, and can effectively support the distributed storage of data. It is revealed that the database created using the proposed methodology has shown tremendous results. However, the proposed solution lacks security precautions in terms of cyber security. Therefore, in the future, we aim to propose an approach that relies on the NIST’s cybersecurity paradigm to assure persistent data integrity replenishment in cloud-based artificial intelligence systems.

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 conflict of interest.

References


