



Web Database Sharing Platform Design Based on Large Data Visualization of Learning Behavior

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Abstract. In order to improve the sharing ability of network database in the visual environment of learning behavior big data, a design method of network database sharing platform based on big data visual analysis of learning behavior is proposed. The piecewise linear coding method is used to collect the characteristics of the network database in the visual environment of learning behavior. The characteristics of association rules of network database shared resources in big data visual environment are extracted, the optimal structure of network database shared resources is reorganized by adaptive spatial resource reorganization method, the optimal storage spatial distribution model of network database shared resources is established, and the statistical analysis method is used to search the association of network database shared resources in big data visual environment. The feature quantity of association rules of network database sharing resources is extracted, and security sharing of network database sharing resources is carried out according to the clustering of feature quantity. The network database sharing platform is designed in embedding ARM environment. The simulation results show that this method has good adaptability and security, and improves the level of resource sharing.

Keywords: Learning behavior · Big data · Visualization · Network database · Shared platform

1 Introduction

With the development of information security construction, under the visual environment of learning behavior big data, it is necessary to construct the security sharing model of network database shared resources, combined with the distributed storage structure and characteristic distribution of network database shared resources, to optimize the scheduling and sharing of network database shared resources under big data visual environment. To improve the ability of optimal storage and distributed scheduling of shared resources in network database [1]. Under the condition of information construction, through the establishment of network database sharing in big data visual environment of learning behavior, the optimal management and retrieval

ability of shared resources in a network database can be improved. With the integration technology of mobile terminal and big data, the information sharing design of network database sharing resources under big data visualization environment of learning behavior is carried out, and the retrieval and information management level of network database sharing resources under big data visualization environment of learning behavior is improved. Optimal storage design of resources is carried out, and the statistical analysis method and adaptive information retrieval method are used to improve the optimal scheduling ability of shared resources in network databases. It is of great significance to study the related resource sharing scheduling methods in the optimal management of shared resources in network databases [2].

Traditionally, sharing scheduling methods of network database under the visual environment of learning behavior big data mainly include fuzzy information clustering method, statistical analysis method, association rule scheduling method and so on [3]. Shared resource management and allocation model of network database under the visual environment of learning behavior big data is established, and the adaptive allocation and optimal scheduling of resource information are carried out in combination with association rule mining violation. To improve the ability of big data feature collection and optimal allocation of network database under big data visual environment of learning behavior. In reference [4], a sharing scheduling method of network database under big data visualization environment of learning behavior based on fuzzy statistical analysis is proposed. Combined with quantitative evaluation model, it is possible to mine the information of shared resources of network database under the visual environment of learning behavior. The fuzzy clustering method is used to classify and identify the shared resources of network database in big data visual environment, but the computational overhead of this method is large and the adaptability of this method is not good. In reference [5], a resource security sharing method based on directed graph analysis is proposed, and the spatial information sampling technology is combined to optimize the collection and scheduling of resources, but the anti-interference of this method is not good [6].

In view of the above problems, the present invention provides a method for sharing a network database in a big data visualization environment based on big data visualization analysis of learning behavior. The method includes the following steps:

1. Extracting the feature quantity of the association rule of the shared resource. Using fuzzy comprehensive clustering method, combined with learning behavior, the information clustering processing of network database shared resources are performed. Establish a big data feature acquisition model based on the statistical feature distribution set of shared resources to obtain feature quantity.
2. Optimize the storage structure of the database. Through the related statistical analysis method, the similarity of network database sharing is determined, and the semantic ontology feature set of shared resources is obtained. The fuzzy C-means clustering method is used to construct the user perception model, and the database distribution structure method is used to realize the network database sharing.
3. Optimized structural reorganization of the network database shared resources.
4. Using the auto-correlation feature matching method, based on the distribution of storage nodes, under the big data visualization environment of learning behaviors,

quantitative assessment of the network database shared resources is performed to realize the reorganization of network database shared resources.

5. Feature extraction and secure sharing. Combining oriented clustering is performed for database resource retrieval. By statistical analysis, the feature quantity is searched by correlation. According to the clustering of feature quantity, secure sharing of network database shared resources.

By building a network database sharing platform, it not only effectively integrates decentralized and different standards of network data information, but also systematizes network data, improves the management level of network data information, and optimizes the management model of data information. Development to create a healthy environment for sustainable development

2 Feature Acquisition and Optimization of Storage Structure of Big Data in Network Database

2.1 Feature Collections of Big Data in Network Database

In order to realize the network database sharing under the visual environment of learning behavior big data, it is necessary to construct the optimal storage model of network database sharing resources under the visual environment of learning behavior big data. Combined with the spatial information sampling method, the network database sharing design under the visual environment of learning behavior big data is carried out, and the resource access is realized from the user interface. The replica manager is used to process the network database sharing, resource scheduling and replica correlation fusion in big data visual environment, and the collection and information scheduling model of network database sharing resources in big data visual environment is obtained [7].

According to the semantic feature distribution set of the shared resource of the network database under the large data visualization environment of the learning behavior, the judgment criteria for determining the intelligent sharing and scheduling of the shared resource of the network database under the large data visualization environment of the learning behavior [8] are as follows:

$$S(i,j) = \frac{\sum_{u \in U_{ij}} (V_{u,i} - 3)(V_{u,j} - 3)}{\sqrt{\sum_{u \in U_{ij}} (V_{u,i} - \bar{V}_i)^2} \sqrt{\sum_{u \in U_{ij}} (V_{u,j} - \bar{V}_j)^2}} \quad (1)$$

The network database sharing resource pool fusion processing is carried out in combination with the characteristic distribution perceived by the user, and the information clustering processing of the shared resource of the network database under the large data visualization environment of the learning behavior is carried out in combination with the fuzzy comprehensive clustering method [9], the method comprises the following steps of: performing a user-aware network database large-data feature association rule feature quantity in a clustering center as follows:

$$V_{u,i} = \frac{D_i^-}{D_i^+ + D_i^-}, \bar{V}_j = \frac{R_i^+}{R_i^+ + R_i^-} \tag{2}$$

Constructing a self-adaptive fusion cluster analysis model of a network database shared resource in a large data visualization environment of a learning behavior [10], the invention realizes the reconstruction of the fuzzy index set of the shared resource of the network database under the large data visualization environment of the learning behavior, and obtains the fuzzy output set of the network database shared resource fusion scheduling as the $E_k \in E(k = 1, 2, \dots, t)$, The integration model of the intelligent sharing of the large data features of the user-aware network database under the large data visualization environment of the learning behavior is $P_i \in P(i = 1, 2, \dots, m)$, and the statistical analysis and the quantitative regression analysis method [11] are adopted, the method comprises the following steps of: calculating a text feature vector v_i and a $v_i = ((w_1, t_1), (w_2, t_2), \dots (w_j, t_j))$ of a large-data feature library of a user-aware network database in a large-data visualization environment of a learning behavior, and adopting a decision similarity (correlation) analysis [12] method to obtain a fuzzy set of the network database shared resource acquisition:

$$V = \{v_{ij} | i = 1, 2, \dots, c, j = 1, 2, \dots, s\} \tag{3}$$

In which, V_i is a statistical characteristic distribution set of a network database shared resource in a large-data visualization environment of learning behavior, and based on the analysis, a large-data characteristic acquisition model of a network database is established, and a fusion cluster analysis is carried out according to the information acquisition result so as to improve the resource sharing level [13].

2.2 Database-Optimized Storage Structure

Combined with feature mining method, the database distribution structure of user-aware network is reorganized. Assuming that user-aware network dataset $X = \{x_1, x_2, \dots, x_n\}$, n is the number of dataset X in big data visual environment. The formula for intelligent sharing of shared resources in a network database under big data visualization environment is obtained.

$$U_{ij}(t) = \exp\left[-b[z_i(t) - z_j(t)]^2\right] \tag{4}$$

By using the correlation statistical analysis method, the similarity of network database sharing under the big data visualization environment of learning behavior is obtained as follows:

$$S_{ij}(t) = \frac{p_{ij}(t) - sp_{ij}(t)}{p_{ij}(t)} \tag{5}$$

In which: $p_{i,j}(t)$ is the fuzzy correlation feature distribution set shared by the network database, and $\Delta p(t)$ is the fuzzy decision increment value [14] shared by the network database. The invention relates to a fuzzy degree characteristic distribution set of a network database shared resource in a large data visualization environment of a learning behavior by using a 4-tuple (E_i, E_j, d, t) , wherein the E_i, E_j are the statistic feature quantity and the correlation rule feature quantity, and a distributed sensing and fusion method is adopted, the feature reconstruction of the shared resource of the network database is carried out [15], and the semantic ontology feature set of the shared resource of the network database under the large data visualization environment of the learning behavior is extracted to be as follows:

$$TF(t, c_i) = \frac{P(t|c_i)}{\sum_{j \rightarrow n} P(t_j|c_i)} \quad (6)$$

Wherein, t is the statistical characteristic quantity of the shared resources of the network database, and the multiple regression distribution model of the fusion and sharing of the shared resources of the network database under the visual environment of the learning behavior of big data is expressed as follows:

$$\mu_{ik} = 1 / \sum_{j=1}^c (d_{ik}/d_{jk})^{\frac{2}{m-1}} \quad (7)$$

$$V_i = \sum_{k=1}^m (\mu_{ik})^m x_k / \sum_{k=1}^n (\mu_{ik})^m \quad (8)$$

The fuzzy C-means clustering method is used to construct a user-aware model in a large-data visualization environment of learning behavior, and a resource structure recombination method is combined to realize the sharing of the network database, and the characteristic cluster analysis is realized in the fuzzy center $C(Y)$, and the resource security sharing level is improved [16].

3 Network Database Sharing and Optimization

3.1 Optimized Structural Reorganizations of the Network Database Sharing Resource

on the basis of the analysis of the large data characteristic acquisition and the information storage structure of the network database under the large data visualization environment of the learning behavior by adopting the segmented linear coding method, the optimization design of the network database sharing is carried out, In this paper, a method of network database sharing based on learning behavior and large data visualization analysis is presented in this paper [17]. The difference fusion feature quantity of the network database sharing under the large-data visualization environment of learning behavior is expressed as follows:

$$J_m(U, V) = \sum_{k=1}^n \sum_{i=1}^c \mu_{ik}^m (d_{ik})^2 \tag{9}$$

The method of autocorrelation feature matching is used to quantitatively evaluate the shared resources of network database in big data visual environment of learning behavior. The distribution incremental structure of shared resources of network database in big data visual environment of learning behavior is expressed as a dimension vector [18], and the optimal migration model of shared resources of network database is described as follows:

$$p(e_k | v_k) \sim t_{(v_k + d_e)}(u_{e|v,k}, \Sigma_{e|v,k}) \tag{10}$$

The quantitative evaluation node distribution structure of shared resources in learning behavior big data visualization environment is constructed by using directed graph model, and the optimal storage space distribution model of network database shared resources is established as:

$$\min(f) = \sum_{i=1}^m \sum_{j=1}^n C_{ij} X_{ij} \tag{11}$$

$$\text{s.t.} \begin{cases} \sum_{j=1}^m X_{ij} = a_i, i = 1, 2 \dots m \\ \sum_{i=1}^m X_{ij} = b_j, j = 1, 2 \dots n \\ X_{ij} \geq 0, i = 1, 2 \dots m, j = 1, 2 \dots n \end{cases} \tag{12}$$

According to the distribution of the storage nodes, carrying out a quantitative evaluation on the shared resources of the network database under the large data visualization environment of the learning behavior, and realizing the structure recombination of the shared resource of the network database [19].

3.2 Implementation of Feature Extraction and Security Sharing

The statistical analysis method is used to search the shared resources of the network database under the visual environment of big data. The interference signal-to-noise ratio (SNR) of the distributed environment of the shared resources of the network database under the visual environment of big data is defined as follows:

$$SNKR_i = (3/2) |\sigma^4 / \gamma| \lambda SNR_i^2 \tag{13}$$

The distributed link fusion set of database resource retrieval is constructed, combined with association rule mining and fuzzy C-means clustering method, the feature directional clustering of database resource retrieval is carried out, and the clustering function is obtained as follows:

$$J_m(U, V) = \sum_{k=1}^n \sum_{i=1}^c \mu_{ik}^m (d_{ik})^2 x_i = x_{i\min} + cx_i \cdot (x_{i\max} - x_{i\min}) \quad (14)$$

The self-adaptive optimization method is adopted to realize the user-aware network under the large-data visualization environment of learning behavior, and the optimized solution is obtained:

$$\sum_{i=1}^c \mu_{ik} = 1, k = 1, 2, \dots, n \quad (15)$$

Under the visual environment of learning behavior big data, the output of network database sharing is as follows:

$$x_{n,G} = x_{n,G} + \Delta x_i \quad (16)$$

in a comprehensive analysis, an association search of a shared resource of a network database in a large data visualization environment of a learning behavior is carried out by adopting a statistical analysis method, an association rule feature quantity of a shared resource of a network database is extracted [20]. According to the clustering of the feature quantity, security sharing of the shared resources of the network database is carried out, the overall implementation process is shown in Fig. 1.

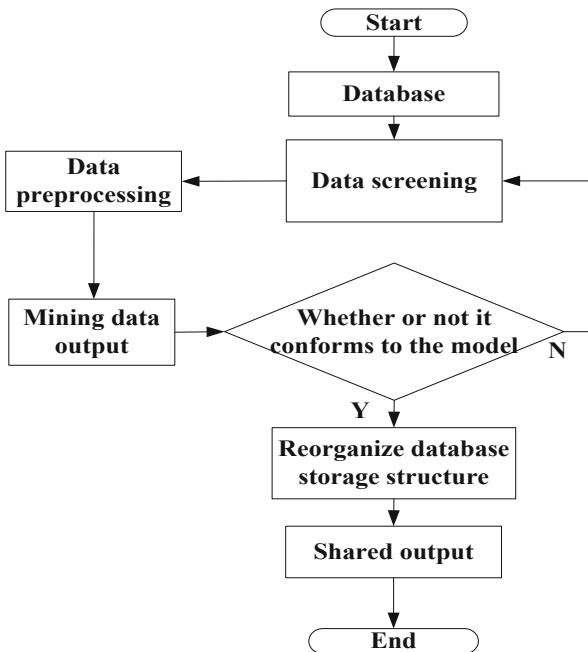


Fig. 1. Implementation flow of network database sharing in big data visual environment of learning behavior

4 Simulation Experiment and Result Analysis

In order to verify the application performance of this method in realizing the visual environment of learning behavior big data, the simulation experiment is carried out with Matlab. The length of information retrieval of network database shared resources using MySQL, is set to 2000, the distribution coefficient of information entropy is 0.46, the coefficient of association rules is 0.89, and the fuzzy membership parameter is set to 1.5, the length of information retrieval of shared resources of network database is set to 2000, the distribution coefficient of information entropy is 0.46, the coefficient of association rules is 0.89, and the fuzzy membership parameter is 1.5. According to the above parameters, the APP login interface of the network database sharing platform is shown in Fig. 2.



Fig. 2. APP login interface of network database sharing platform

Combining association rule mining and fuzzy C-means clustering method, directional clustering of retrieval features and big data analysis was performed, and the results of big data visualization analysis were obtained, as showed in Fig. 3.

In Fig. 3, the network sharing information nodes is densely distributed and show a good sharing effect, which proves the effectiveness of the method in this paper. The sampling interval of shared resources in the network database is 16 ms, and the carrier frequency of network link transmission perceived by users in big data visual environment is 50 kHz. Taking the above resource data set as the research object, the resource sharing level is obtained as showed in Fig. 4.

The analysis in Fig. 4 shows that the level of resource sharing of the traditional method is low, and the level of resource sharing of this method is higher than that of the traditional method. Reduce the interference signal-to-noise of the distributed link

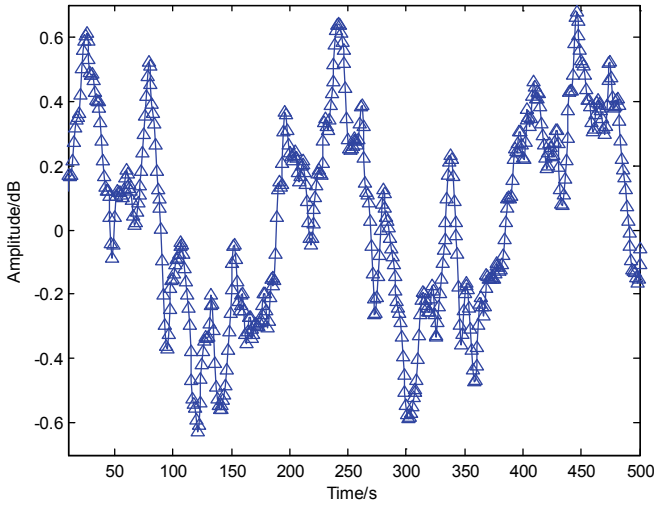


Fig. 3. Large data visualization analysis results

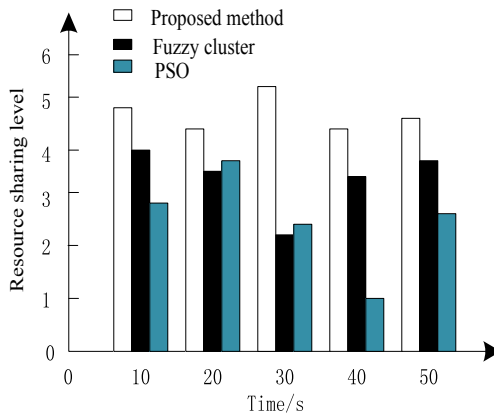


Fig. 4. Resource sharing level

fusion set of resource retrieval and improve the order of the set. Database resource retrieval feature-oriented clustering combining association rule mining and fuzzy C-means clustering method improves the convergence of sets and increases the level of resource sharing. Based on the above research, the sharing rate is tested and analyzed. The results are shown in Fig. 5.

It can be seen from Fig. 5 that the information sharing rate of the method in this paper is much higher than that of traditional methods, and the rate of change does not increase with the number of iterations, while the ratio of the traditional method changes with the number of iterations. The amplitude is large, and the stability of the method is poor. Because when extracting the feature quantity of the association rule of the shared

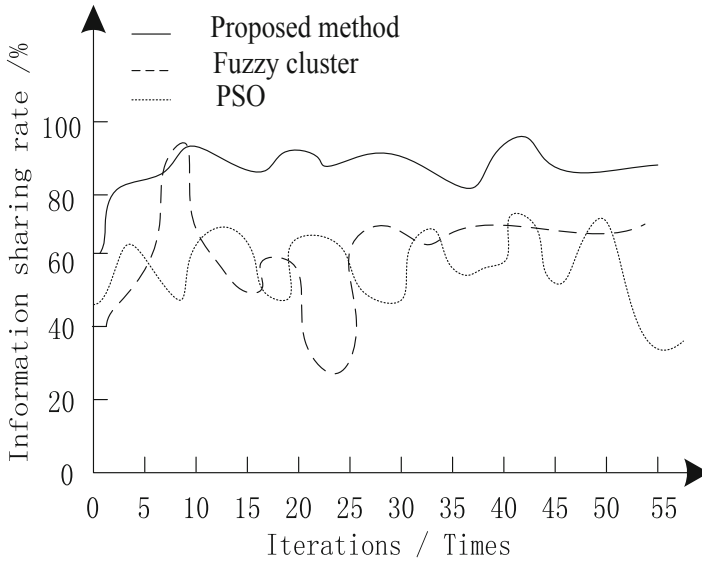


Fig. 5. Information sharing rate

resource, the comprehensive fuzzy clustering method is used to perform the clustering process, so that the similar and detailed information is gathered, and the information sharing ratio is improved. Under the analysis of the analysis rate, the accuracy of the information is compared to determine the superiority of the method in this paper. It has an improved level of information sharing.

It can be seen from Table 1 that the accuracy of the two traditional methods is low, and the accuracy changes greatly as the number of iterations increases. However, the accuracy of the methods in this paper is higher than that of traditional methods, and the increase of the number of iterations, the accuracy changes less, and it shows stability. Because the method in this paper uses the auto-correlation feature matching method, based on the distribution of storage nodes, the network database shared resources are quantitatively evaluated to obtain the optimal migration model of shared resources. The model optimizes the distribution of storage nodes and improves the accuracy of resource sharing.

Table 1. Precision comparison

Iterations	Proposed method	Fuzzy cluster	PSO
100	0.943	0.864	0.917
300	0.995	0.912	0.929
500	0.999	0.932	0.934

5 Conclusions

In this paper, a design method of network database sharing platform based on big data visual analysis of learning behavior is proposed. The piecewise linear coding method is used to collect the characteristics of the network database in the visual environment of learning behavior. The characteristics of association rules of network database shared resources in big data visual environment are extracted, the optimal structure of network database shared resources is reorganized by adaptive spatial resource reorganization method, the optimal storage spatial distribution model of network database shared resources is established, and the statistical analysis method is used to search the association of network database shared resources in big data visual environment. The feature quantity of association rules of network database sharing resources is extracted, and security sharing of network database sharing resources is carried out according to the clustering of feature quantity. The network database sharing platform is designed in embedding ARM environment. The simulation results show that this method has good adaptability and security, and the level of resource sharing is improved.

Fund Project. 2019 Guangdong Higher Education Teaching Reform Project “Research on Network Database Learning Based on Learning Behavior Big Data Visualization”; 2019 Huali College Guangdong University of Technology Project “Research on Network Database Learning Based on Learning Behavior Big Data Visualization” (GGDHLJYZ[2019]No.32).

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