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Efficient Real-Time Information Interaction and Discrimination: Exploration and Application of IT System Algorithms Based on Big Data Processing Technology

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Abstract: This article discusses an efficient real-time information interactive discrimination system algorithm based on big data processing technology. This paper introduces the big data technology brought by the development of mobile network and social network, and emphasizes the importance of big data in modern information processing. Under the background of big data technology, the paper focuses on the construction and implementation of the computing and data collaboration mechanism to achieve the goal of processing massive data in real time. At the same time, by introducing advanced algorithms and technologies, a method and system of data interaction information discrimination are presented, which can deeply mine the original data from different sources, so as to accurately discriminate the abnormal operation. These research results provide a new algorithm exploration and application path for IT systems, and provide a strong support for efficient real-time information interaction and disagreement. At the same time, it also promotes the application and development of big data technology in various fields, through this system, enterprises and organizations can better cope with the challenges brought by the data explosion, and improve the ability of information processing and decision-making.

1. Introduction

In today's information age, data and computing have become core issues in the development of science and technology. With the vigorous development of mobile networks and social networks, big data technology is gradually leading the wave of technological innovation. The concept and characteristics of big data have been fully demonstrated in this context, which mainly refers to the analysis, transmission and storage of massive data. In the context of this technological innovation, it becomes crucial to form a mechanism that collaborates computing and data. This not only helps better coordinate data and computing, but also promotes the efficient use and sharing of information resources, thereby promoting the development of all walks of life. This article will focus on the efficient real-time information interaction and discrimination system algorithm based on big data processing technology, as well as the construction and implementation of the computing and data

collaboration mechanism in the context of big data technology. At the same time, the article will demonstrate a data interaction information discrimination method and system that can deeply mine raw data from different sources to accurately perform anomaly discrimination operations. These research results provide new algorithm exploration and application paths for IT systems, and provide strong support for efficient real-time information interaction and differentiation.

2. Related Works

Before studying the efficient real-time information interactive discrimination algorithm, we searched and discussed several related studies. These studies provided us with valuable empirical analysis and theoretical support, and at the same time provided us with analytical support through multiple research directions.

L Wang and K Qu discussed the key issues of how to mine valuable information in massive data and ensure information security and reliability in the era of big data. They analyzed the development status of computer information processing technology and its application in the big data environment based on the big data technology environment. specific applications below. [1] T Zheng, G Chen and other scholars proposed an innovative incremental processing technology called streaming cube for processing big data and streaming data, constructing real-time intelligent data processing system. R Liu and Q Zhang's articles introduced how to combine Hadoop and Spark to build an efficient big data processing platform [2], which inspired us. In the context of big data, Wang Jiayu's article introduces how many industries regard information security and privacy protection as the focus of development. [5] Guo Hui and Geng Baoguang elaborated on the characteristics of data collection and dissemination, information storage, and information security in computer information processing technology, and discussed the problems in the information processing process of big data computers and the application of information processing technology, and safe and efficient information processing strategies [7] provides us with a warning. The papers of the above scholars provide us with ideas and methods for this paper, and help us improve our algorithm and paper.

3. Information cross judgment

3.1. Data Structures are Not Stored Differentiated by Features

In the current information age, the development of information interaction and discrimination technology is crucial. However, existing discriminant algorithms are mainly based on mean values and static parameters, which have many shortcomings [3]. The lack of differentiated storage of data structures according to features indicates the lack of adaptability of previous algorithms in data transformation and index derivative processing. [4] The existing logic also fails to fully take into account the classification of user behavior habits, as well as the characteristic differences in the attributes of different industries. At the same time, the real-time dynamic adjustment of trends in different time periods is lacking.

3.2. How to Use Big Data Technology to Improve the Real-Time and Accuracy of Information Interaction

As big data technology continues to mature, how to use big data technology to improve the real-time and accuracy of information interaction and discrimination has become an urgent problem to be solved. How to deeply mine and accurately identify raw data from different sources while ensuring information security is also a new challenge.

3.3. The Old Algorithms Were Underpowered

Cross-domain information exchange involves a variety of data types, and the form, structure and scale of these data show a diverse and rapidly growing trend, as shown in Figure 1.

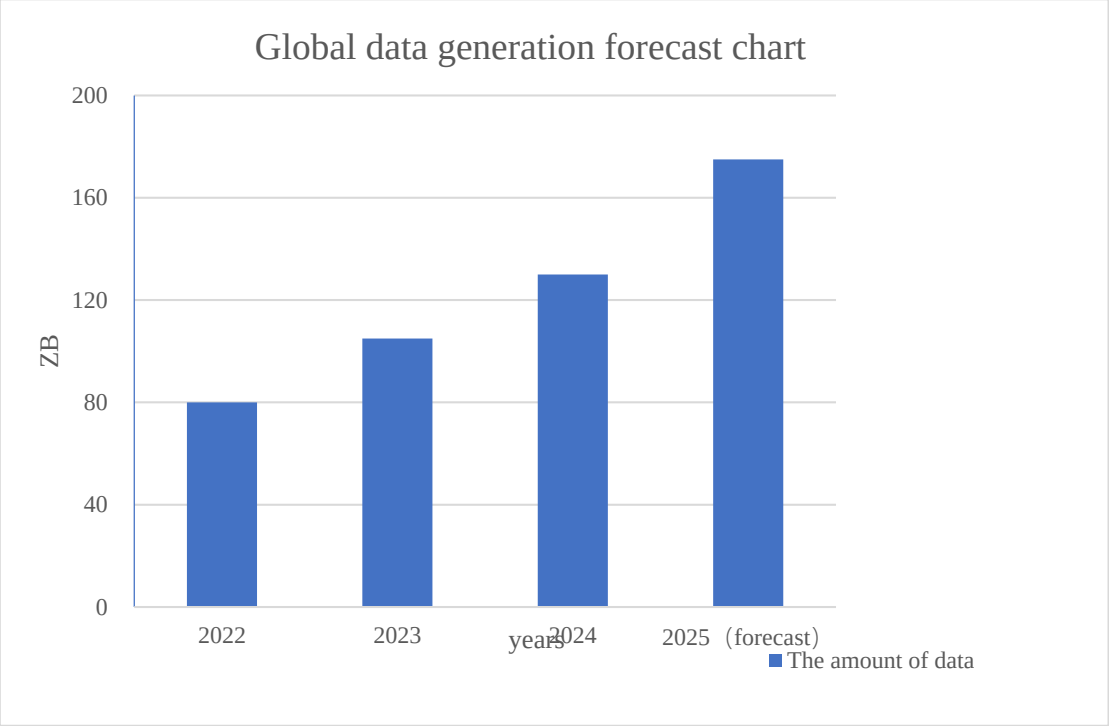

Figure 1: Global data generation forecast chart

However, the current algorithms do not fully process and dig the original data. On the one hand, this leads to increased data storage pressure, higher hardware resource consumption, and reduced system performance, making it difficult to effectively process the original data and conduct deep analysis. On the other hand, it may result in false positives, missed alarms, and delayed responses to failures. Therefore, we propose an efficient real-time information interaction and discrimination system algorithm based on big data processing technology. The technology combines big data technology, computing and data collaboration mechanisms to enable deep mining of raw data from different sources and accurate anomalous discrimination operations. This provides a new algorithm exploration and application path for IT system, and provides a strong support for efficient real-time information interaction and disagreement.

4. Results and Discussion

In the design of information interactive discrimination algorithm, we consider many factors to ensure its high efficiency, accuracy and adaptability. First, we use a combination of big data processing technology and real-time data processing needs to meet the growing amount of data and real-time requirements. We adopt the dynamic adjustment strategy, large-scale use of hierarchical cache scheduling strategy and performance optimization of big data storage system and large-scale RDF semantic data storage management technology and system [6], timely monitor data flow and dynamically adjust algorithm parameters according to changes, so as to adapt to changes in data trends in different time periods. We use streaming data processing systems, such as Apache Kafka and Apache Flink, to support this dynamic adjustment. Second, in terms of data processing, we classify and transform data according to its characteristics, and adopt differentiated processing

strategies, including targeted processing of data from different sources and different natures, which can fully tap the potential value contained in data. We also use metadata mapping and hash mapping technology to process and analyze the data in real time, so as to achieve deep mining and accurate discrimination of the original data. [5] Moreover, we also use machine learning algorithms, such as cluster analysis and anomaly detection algorithms, to carry out feature extraction and pattern recognition on the data to find hidden rules or anomalies in the data. Third, we also consider the classification of user behavior habits. To better understand and analyze data, we Model and analyze user behavior through behavioral pattern recognition and classification algorithms, such as Hidden Markov Model (HMM) and Markov Chain Model, to identify abnormal behavior and deal with it in a timely manner. We also use the user portrait technology to personalize the user model, which can better understand their behavior and needs, and thus improve the accuracy and reliability of discrimination. When considering the feature differences of different business attributes, we also adopt domain knowledge modeling and expert system technology to model and analyze different business scenarios to identify and deal with abnormal situations in specific fields. At the same time, combining rule engine and decision tree algorithm, we can classify and deal with abnormal situations, effectively improving the automation and intelligence level of the system. In the design of information discrimination algorithm, we comprehensively consider many factors such as data processing technology, real-time data processing requirements, data diversity, user behavior characteristics and business attributes.

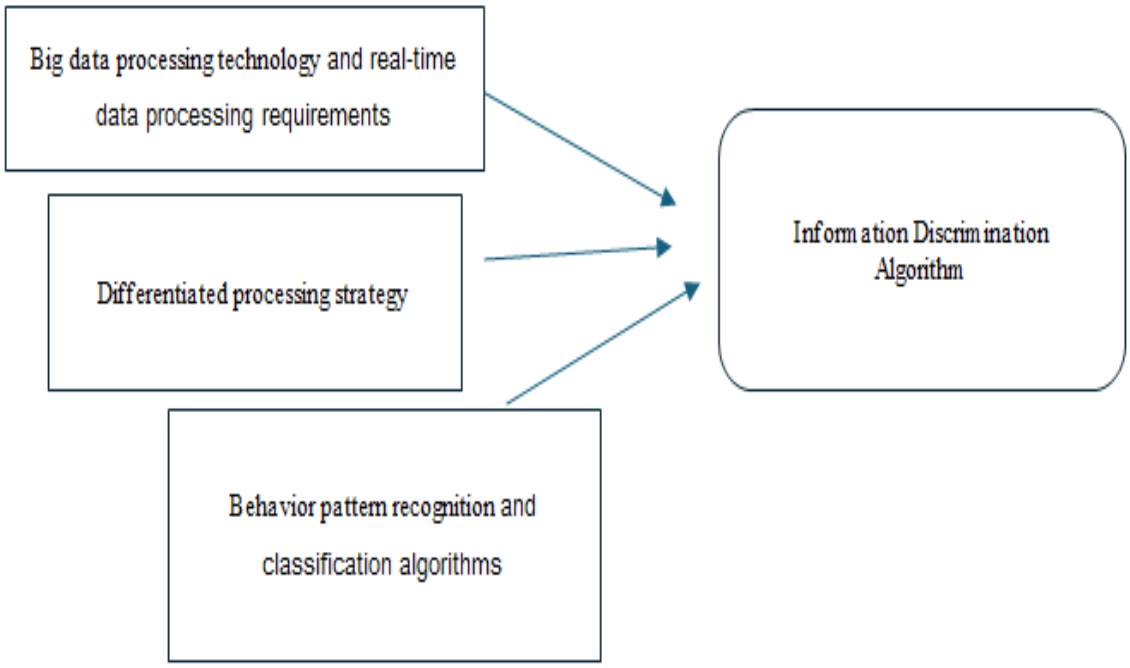

Figure 2: Information Discrimination Algorithm Flow Chart

After we comprehensively consider these factors, as shown in Figure 2, we can design an information discrimination algorithm that is efficient, accurate, and highly adaptable, providing strong support for efficient real-time information interactive discrimination.

5. Algorithm Application Effect Analysis

Based on the data discrimination system and method established by big data processing technology, the algorithm can change, evolve and store the data, and can be more consistent with

the actual data characteristics. This greatly improves the processing performance and efficiency of the data discrimination system, while reducing the misjudgment caused by manual intervention. In the process of processing object data discrimination, derived rules that meet its own laws can be invoked more intelligently according to data characteristics. It can also effectively process and deeply mine the original data interaction information from different sources, so as to more accurately identify abnormal operations, timely discover problems and carry out emergency treatment, and greatly improve operation and maintenance capabilities.

6. Conclusion

In this paper, the importance of efficient real-time information interaction is discussed, the limitations of current algorithms are pointed out, and an innovative solution based on big data processing technology is proposed. In view of the existing problems and limitations, the key strategies of dynamic adjustment and differential treatment are emphasized. The realization of dynamic adjustment depends on the streaming data processing system, which can monitor the data flow in real time and adjust the algorithm parameters flexibly to adapt to the data trend in different time periods. Differentiated processing strategy focuses on classification and transformation according to data characteristics to fully tap the potential value of data. The key to ensure the accuracy and reliability of discrimination is to fully consider the user behavior habits and business attributes, which we use machine learning algorithms and expert system technology to achieve. In short, the algorithm design scheme of efficient real-time information interactive discrimination system based on big data processing technology provides strong technical support for solving the challenges faced by current information discrimination technology. By comprehensively considering data processing technology, real-time data processing requirements, data diversity, user behavior characteristics and business attributes, we design an efficient, accurate and adaptive information discrimination algorithm. This will provide IT systems with more powerful data discrimination capabilities, while further improving the security, stability and reliability of the system, but also for the rapid development and application of information interaction provides a solid technical guarantee.

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