Real Time Auxiliary Data Mining Method Based on Infinite Communication Mechanism Optimization of Internet of Things System

Jing Ling

Suzhou Vocational Institute of Industrial Technology, Suzhou, Jiangsu, 215104, China

00264@siit.edu.cn

Keywords: Internet of Things System, Wireless Communication Mechanism, Data Source Conversion Module

Abstract: This paper mainly studies the content of Internet of things data mining under the infinite communication mechanism. Firstly, it discusses the theoretical basis of infinite communication mechanism, and then analyzes the function realization of Internet of things data mining based on infinite communication mechanism. Data source conversion module is mainly divided into three aspects. Hope to provide reference for the researchers who pay attention to this topic.

1. Introduction

The concept of "Digital Earth" was put forward by human beings in 2010, and its influence has been expanding[1]. At the same time, Chinese people's life is increasingly inseparable from the Internet of things technology. All sectors of society put forward higher requirements for the Internet of things. At present, data mining is the main problem of Internet of things technology. This will be discussed in this paper.

2. The Theoretical Basis of Infinite Communication Mechanism

Cloud computing is proposed on the basis of Internet technology. This computing method is based on the needs of users, through the Internet to provide users with relevant services. Because all the service resources of cloud computing come from the data on the Internet, the Internet also uses the similar cloud mode when displaying related resources, so this technology is called cloud computing. On the basis of relevant application technologies, cloud computing has a very advanced performance and a large scale. For example, Google cloud computing consists of more than one million servers. Other big search engines also have thousands of servers[2]. Virtualization is also a prominent feature of cloud computing. Users can log in at any location or at any terminal to the server. These steps are all implemented in cloud space. Another characteristic of cloud computing is reliability. Under the function of multiple data replicas, the data nodes are isomorphically applied to achieve reliability service[3]. The general characteristics of cloud computing are very obvious. It is not specific to an application, but to create a large number of applications. In addition, large-scale cloud computing can also achieve dynamic scaling to meet the growing needs of users.

Table 1 Usage of address field in data frame

Function	To Ds	From DS	Address 1	Address 2	Address 3	Address 4
IBSS	0	0	DA	SA	AP	not used
To AP	1	0	RA	SA	DA	not used
From AP	0	1	DA	TA	SA	not used
WDS	1	1	RA	TA	DA	SA

3. Analysis of the Role of Internet of Things Data Mining Based on Infinite Communication Mechanism

  DOI: 10.25236/cseem.2020.055

3.1. Analysis of the Functions of The Perception Layer and the Transmission Layer of the Internet of Things

The perception layer of the Internet of things can achieve the perception effect. By setting a large number of data collection points in the target area, the effective perception effect can be achieved. Data acquisition is done by sensors and cameras[4]. Data will be collected and processed centrally. At this time, the network communication function of the sensor layer of the Internet of things will be used. The required data will be transmitted to each point, and then stored centrally through the transport layer, and then the infinite communication mechanism will be achieved through the transport layer. Data processing center, at this time, the functions of the whole sensing layer are realized. The middle link of the whole data transmission process is the Internet of things transmission layer, including sensor, infinite network and other technologies[5]. The transmission system can transmit information efficiently and seamlessly. After the sensor layer of the Internet of things collects data, the collected data will be transmitted to the data processing center more effectively through the transmission system. At this time, the goal of all-round interconnection and interconnection can also be fully realized. Through the careful analysis of the actual work, it is found that the detection and processing equipment has a variety of attributes, and the attributes pointed to are connected and networked, which not only greatly improves the transmission efficiency, but also completes the information transmission between the equipment nodes.

3.2. Function Realization of Data Mining Service Layer

In the data mining service layer, there are data preparation module, data mining engine module and user module. In the data preparation module, the function that can be realized is to analyze the data situation, change the data format, and make data rules[6]. Data mining engine module includes data mining algorithm and evaluation data pattern. In the user module, the function involved is to show the knowledge of data mining in a visual way. There are some differences between different types of data mining, so the function of data mining engine module is very diverse. It can be used for similarity analysis, deviation analysis, trend analysis, association analysis and cluster analysis. The algorithm set provides the above functional algorithms[7]. In order to realize the mining of related algorithms on the Hadoop platform, it is necessary to adjust the traditional data mining algorithm appropriately, and adopt the parallel way to deal with the corresponding algorithm. For example, in the user's direct contact end, that is, the user module of the Internet of things data mining platform, the module takes an important responsibility. The information of the system must be transformed into the information that can be recognized by the user, so the module must have obvious friendliness.

3.3. Functions of Data Source Conversion Module

Internet of things data has obvious heterogeneity and quality characteristics. Therefore, when developing the Internet of things data mining system, Hadoop platform must be able to develop a higher quality Internet of things data mining system, in order to better store and process the Internet of things data. For example, when building the Internet of things data mining system, the data source conversion module and distributed storage module are established[8]. The function of the data source conversion module is to transform the heterogeneous data of the Internet of things, and the function of the distributed storage module is to store the massive data generated by the Internet of things. The function of distributed storage module depends on HDFS file system based on Hadoop cloud computing[9]. Different data types are used when different objects are displayed in the Internet of things. Therefore, the basic characteristics of the Internet of things are heterogeneous. What can be explained more intuitively is that different objects use different data forms. To represent. The function of data source converter is to ensure the complete storage of data and the scientific progress of mining.

4. Data Mining Technology of Internet of Things

4.1. Overview of Data Mining Technology

At present, data mining technology is not advanced and perfect. It has a short history of development. It was developed at the end of last century, but its application scope is expanding. The progress of information processing technology is of great significance to people's production and life. Data mining is not only a scientific research field, but also interdisciplinary. Therefore, data mining involves many industries and is widely used, and each industry is constantly innovating data mining technology.

4.2. Characteristics of Data Mining Technology

Internet of things data is polymorphic, heterogeneous, massive and time-consuming. In the process of mining data value, the technology used will be: scale and distribution. Making the most of the limited resource nodes not only ensures the security of data, but also reflects the scale of data. The data of the Internet of things are stored in various locations, and the types of each data are classified accurately. Due to the large and complex amount of data, the data needs to be equipped with sensor nodes to ensure the timeliness of data information processing.

4.3. Technical Requirements for Internet of Things Data Processing

The characteristics of the Internet of things data bring great challenges to data quality control, data query, integration, compression, storage, integration, etc., which urge the technical personnel to continuously explore effective solutions to meet the characteristics of data and solve the problems of data analysis and processing. Encounter contradictions[10]. Heterogeneous requirements. In order to solve the problem of data heterogeneity in the Internet of things, we need to start with computer software. Computers use different operating systems. Different remote sensing information needs different data structures and databases. Different operating systems are equipped with different interrogation software. The operating system is used to solve the problems of the operating platform. Data is used for data mining, storage, and retrieval. Middleware is responsible for data transmission, filtering and fusion. Choosing the right computer operating system, database and middleware can avoid the heterogeneity of data. Especially the choice of database and middleware is very important. Quality and timeliness requirements. The large amount of data leads to the difficulty of data storage, the delay of calculation results and the slow response time. There are two solutions to this problem. The first is to upgrade the server and put all data on the server for processing and calculation; the second is to improve the computing capacity and intelligence level of each small unit of the Internet of things and mediate the data itself. After processing, the remaining data processing tasks are placed on the server. Data transmission needs. Data collection and transmission can be carried out smoothly, which ensures the normal data mining and analysis of the Internet of things. The key components of data collection and transmission are readers, RFW tags, sensors, nodes, etc., which are the sources of Internet of things data. For the Internet of things system to run continuously and reliably, the system hardware must meet the characteristics of low power consumption, high reliability and strong anti-interference ability. The right choice of architecture model is also the basis of system maturity and promotion. Therefore, in order to ensure the smooth progress of data transmission, we must pay attention to high-quality data source hardware equipment and correct mechanism model selection.

4.4. Problems in Data Mining Technology of Internet of Things

Everything has its uniqueness, and the Internet of things is no exception. In combination with its own operation mode and law, the Internet of things is also facing some problems that need to be solved in the development process, mainly: the amount of data in the Internet of things is huge and messy. Due to the large amount of data, data storage is not timely, timeliness is low, and effectiveness is low. This kind of large-scale data storage needs high quality and good performance computer hardware. But the existing equipment can not meet this requirement, which is also a huge dilemma we are facing. The data utilization rate is constantly improving according to people's needs, but it is based on the increase of data nodes. Fewer and fewer nodes meet this demand, and the

supply and demand are unbalanced. New technologies need to be invented to improve and solve this problem. Insufficient supply of data nodes. Unstable factors still exist, such as whether the network is stable, whether information privacy measures are in place, and whether data security is guaranteed. These uncertainties need to be addressed in the development process.

5. Conclusion

To sum up, the Internet of things data mining will get a good development under the support of infinite communication mechanism technology. Developing an Internet of things data mining system based on Hadoop platform can achieve more comprehensive functions. The function realization analysis of this paper will be further deepened in the future to improve the intelligence and efficiency of data mining.

References

[1] Qureshi, Iqbal., Asghar. Energy efficient wireless communication technique based on Cognitive Radio for Internet of Things. Journal of Network & Computer Applications, no. 89, 2017.

[2] Liang, Yong, Chu., Shuo, Dang., Gen, Pei. Xie. Construction and Cooperation Mechanism of Logistics Vehicle Scheduling System Based on Ontology and Multi-Agent. Applied Mechanics & Materials, no. 865, pp. 681-688, 2017.

[3] Vasileios, A. Memos., Kostas, E. Psannis., Yutaka, Ishibashi. An Efficient Algorithm for Media-based Surveillance System (EAMSuS) in IoT Smart City Framework. Future Generation Computer Systems, 2017.

[4] Puspraj, Singh, Chauhan., Vidhi, Rana., Sandeep, Kumar. Performance analysis of wireless communication system over nonidentical cascaded generalised gamma fading channels. International Journal of Communication Systems, no. 7, 2019.

[5] S. Jayanthi., N. Stalin., S. Sutha. Internet of Things (IOT) Based Generous Transformational Optimization Algorithm (GTOA) for Hybrid Renewable Energy System Synchronization and Status Monitioring. Wireless Personal Communications, vol. 102, no. 4, pp. 2597-2618, 2018.

[6] Te-Chuan, Chiu., Yuan-Yao, Shih., Ai-Chun, Pang. Optimized Day-Ahead Pricing With Renewable Energy Demand-Side Management for Smart Grids. IEEE Internet of Things Journal, vol. 4, no. 2, pp. 374-383, 2017.

[7] Wenlong, Chen., Mingshu, Zhang., Guangwu, Hu. Constrained Random Routing Mechanism for Source Privacy Protection in WSNs. IEEE Access, no. 99, pp. 1-1, 2017.

[8] Kumar, C.P., Selvakumar, R. Erasure Codes for Reliable Communication in Internet of Things (IoT) Embedded with Wireless Sensors. 2018.

[9] Li, Liu., Guangjie, Han., Sammy, Chan. An SNR-Assured Anti-Jamming Routing Protocol for Reliable Communication in Industrial Wireless Sensor Networks. IEEE Communications Magazine, vol. 56, no. 2, pp. 23-29, 2018.

[10] Alyssa, Apsel. A Simple Guide to Low-Power Wireless Technologies: Balancing the Tradeoffs for the Internet of Things and Medical Applications. IEEE Solid-State Circuits Magazine, vol. 10, no. 4, pp. 16-23, 2019.