

# The Application Optimization of RFID Technology of IOT in Data Intelligence

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**Keyword:** RFID Technology of IOT, Data Intelligence, Data Mining

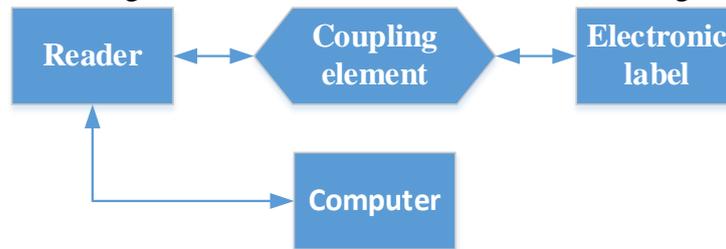
**Abstract:** Internet of Things technology has developed rapidly in recent years. Under the support of network technology, the theory of fuzzy data analysis has also gradually improved. The construction idea is to issue more precise instructions in the case of fuzzy data information, so that the sensor can perform the improvement of database information more efficiently in the network environment, and carry out the function conversion in the next stage according to the instructions it received. The RFID technology of IOT is a kind of information recognition technology that uses radio frequency electromagnetic waves for no contact in a certain distance. In recent years, with the continuous development of science technology and IOT technology, RFID has become more and more complete, especially suited in the field of automation control. Different applications for different radio frequency distance. It can be use as barcode for retail use in the short distance, which not only solves the problem that traditional barcode is easily contaminated by moisture, and it's difficult to change after printing, but also RFID can be reused, and the content can be repeatedly modified, and the loaded data capacity can reach MegaBytes.

Science and technology have been applied in fields of human life, work, and national defense, and have been increasingly applied in various fields of life. The popularity of technology has brought great convenience to people's lives. IOT technology is an emerging technology that promotes productivity change based on user needs. IOT technology is a new kind of technology that promotes productivity change based on needs of users. It is the representative technology that has had a huge impact on information technology since the beginning of the 21st century. IOT is the extension of the Internet. It links the items in the Internet through communication aware technology and simulation technology, which not only realizes communication and information transmission between any items, but also realizes the information transmission between humans and objects. It is widely used in many industries such as digital home, urban management, navigation system, retail, medical, intelligent transportation, banking, etc. It is a major leap of human beings in the field of science and technology and also the direction of social development in the future. In the field of IOT applications, RFID is a kind of widely used technology, it has lots of advantages, such waterproof, high temperature resistance, long service life, long reading distance, data on the tag can be encrypted, large storage data capacity, storage information can be modified at will, identify high-speed moving objects, multiple tags can be identified, and work in harsh environment. This paper proposes the use of data mining technology to analyze big data, and design the intelligent analysis system of IOT energy consumption data to verify the feasibility of data mining theory research.

## 1. RFID Technology of IOT

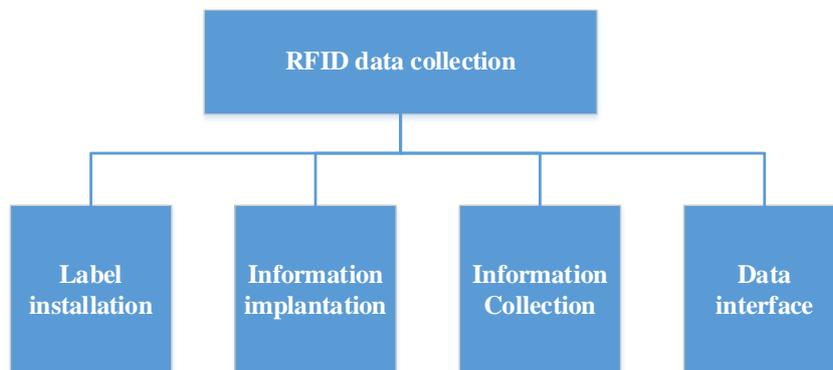
The Internet of Things is the result of the interconnection, integration and unification of various modern information technologies. It's the entirety of sensing technology, internet technology, and AI technology. Therefore, the integration of the Internet must be realized, which means the network, telecommunication communication system, and broadcast television are merged into a very large scale network to realize limited sharing, management, and control of network resources. RFID technology is also called Radio Frequency Identification, Radio waves can be used to identify specific targets and read data without the need to identify optical or machine contact between the platform and the target. Radio waves transform data from the tag of the accessory to the outside by

changing the direction of the magnetic field of the radio frequency to automatically identify or track such items. In the identification process, a part of the tags can obtain energy from the magnetic field generated by the recognizer, and without any batteries. And there is another type of tags that come with power supply and can emit various electromagnetic waves, such as radio waves, infrared rays, X-rays, etc. RFID tags store a large amount of electronic data and can be effectively identified in the distance of 100 meters. Generally, the RFID system includes four parts of reader, data acquisition middleware, tag, and application system. Some RFID systems collectively refer to data acquisition middleware and software as application software system, and the hardware part is composed of RFID electronic tag and reader. Its structure is as shown in Figure 1:



**Figure 1** the composition of RFID

RFID technology is a kind of IOT technology that can be widely used. RFID IOT technology is a non-contact and automatic identification technology, which is mainly used in electronic tags and readers. The IOT technology based on data intelligence uses electronic tags and readers to transmit information to remote terminals over the network to process, store, inquire and share various information. In essence, RFID is a simple set of operating system consisted of electronic tags, computer networks, and readers. The electronic tag contains two parts of antenna and chip. The antenna is mainly used to transmit radio waves, and the chip is mainly used to store internal data. Combined with the communication interface specification to realize the storage of the reader tag memory of RFID and the read of effective information, and then transmitted to the Internet of Things database of enterprises through the network. Its specific acquisition mode is as shown in Figure 2.



**Figure 2** the Data acquisition module based on RFID

## 2. Collection Principle of Intelligent Data

According to the different objects provided by IOT technology, its typical application can be roughly divided into four aspects. The first one is used in intelligent home, which can improve the informationization and intelligence of people's living environment. The second one is applied to enterprises, which can realize enterprise assets, logistics and auxiliary production line management based on Internet of Things technology. The third one is for public utilities, which can be applied to medical care, education, environmental protection and infrastructure maintenance. The fourth is used in industrial manufacturing and other aspects. The Internet of Things is not only a network of objects in a single area, it is highly scalable, and information sharing is easily achieved via the Internet. The development of the IOT technology mainly needs to complete the construction of three-layer architecture. The sensing layer is used for data collection, and it's generally composed of

a sensor network. The network layer serves as a bridge between physical hardware and software systems, and is mainly implemented through various communication technologies. The application layer is mainly composed of the interaction human and computer and service applications.

Intelligent data collection adopts distributed structure, modular design idea and relies on existing network resources. Use an ear tag with RFID radio frequency chip to build up an information platform for networking, hierarchical application, level aggregation, central scheduling, unified authority, unified control, and resource sharing. The B/S structure mode should be used in the development of the upper computer management system for data, so that users can run the application directly in the browser without installing any plugins, which facilitates project implementation and equipment deployment, and is also convenient for management. Design the operating interface as friendly and humanize as possible to maximize users' understanding of the system and streamline the operation process. Promptly offer friendly reminder in the case of users' error operations. Reliability is the primary condition for the system to be applied. The constructed system must not only be able to operate stably, but also have strong fault tolerance and certain resilience after failure.

### **3. The Application Optimization of RFID Technology of IOT in Data Intelligence**

#### **3.1 Optimization of Physical Mechanism**

Physical mechanism is to protect the security of the system without using a cryptographic algorithm, which mainly for low cost tags. The main methods are killing functions, renaming method, blocking method and electrostatic shielding method. Integrate a kill function in the electronic tag of data intelligent IOT RFID system, and completely kill the tag after the tag accepts the reader kill command can make the tag unusable. The disadvantage of this method is that the tags of university library and store cannot be used again after killing. As the identification code of the encrypted RFID tag is fixed, the privacy of the RFID tag cannot be protected.

#### **3.2 Optimization of Encryption Authentication Mechanism**

The physical mechanism is primarily designed for lower cost tags. Since there is no password, the algorithm has many limitations in security. So, some encryption measures can be used to resist illegal attacks. The purpose of achieving specific communication with the support of information security technology is the designing goal of security protocol. Since the IOT RFID system of data intelligence is an open system, it often suffers from attack threats in the application layer communication process. Therefore, preventing the data information from being stolen and destroyed requires a reasonable security design of the RFID application layer communication protocol.

#### **3.3 Control of Data Collection Error**

The middleware connects the upper application system and the lower RFID acquisition device to realize data acquisition and integration between the upper application system and the RFID collection device. As the RFID system uses wireless data transmission method, they are susceptible to be interfered in the transmission. These interferences mainly include external electromagnetic interference and internal noise. These interferences can cause errors in the transmitted signal, eventually cause the change of transmission data, and result in data transmission errors and generate mistaken data. If increase the signal-to-noise ratio and the output power of reader, it will exceed the receiving standard of reader and electromagnetic pollution will be easily generated.

### **4. Conclusion**

As data mining can analyze massive data to discover potential and useful knowledge, help users discover the useful information hidden in the data better. The traditional data mining method has multiple scan databases and needs to generate a large number of candidate sets in the process of association rules, which occupies a large number of resources and affects the efficiency of clustering, so it's necessary to research to reduce the number of database scans and rapid generation

of frequent itemset. RDIF technology is very important in the IOT awareness layer. Due to its low cost and simple operation, it has already been applied to various fields. This paper expounds the concept of IOT RFID system, analyzes its structure, and then points out the perceptual layer threats, network threats and application layer threats faced by intelligent data applications. Finally, it proposes two strategies of physical mechanism and encryption mechanism, which provides reference for the solutions of IOT RFID system security threat in intelligent data at this stage.

## Acknowledgement

Key scientific and technological research projects of Jiangxi Provincial Department of Education (No.GJJ161482)

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