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# *Artificial Intelligence Technology in Intelligent Farm*

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***Abstract:*** With the development of science and technology, China's aquaculture industry is developing in the direction of intelligence, and artificial intelligence technology has been widely used in aquaculture. In the farm, the monitoring of livestock environment is very important. This paper studies the application of artificial intelligence technology in the monitoring of livestock environment in intelligent farm, in order to elaborate the application and prospect of artificial intelligence technology in intelligent farm. In this paper, ZigBee technology and wireless Internet of things technology are used to realize the intelligent livestock environment monitoring system in the farm. Carbon dioxide monitoring, temperature and humidity monitoring and light monitoring are set up to monitor the livestock environment, and a pig house is selected to test the function realization. In addition, the performance of the system is also tested. The test results show that when the number of nodes is 1, the actual response time of the system is 0.38s, the expected value is 0.4s, when the number of nodes is 2, the actual response time of the system is 0.42s, the expected value is 0.45s, when the number of nodes is 9, the actual response time of the system is 0.76s, the expected value is 0.85s, when the number of nodes is 10, the actual response time of the system is 0.78s, the expected value is 0.9s. The results show that with the increase of the number of nodes, the response time of the system increases correspondingly, but it does not exceed the expected value, that is to say, the system in this paper has a great advantage in response time.

## 1. Introduction

The development of the breeding industry is directly related to the increase of the farmers' income. At the same time, the development of the breeding industry is also a highly concerned project of the party and government organs at all levels in China. It is related to the adjustment of the industrial structure of agriculture in China and an important part of the adjustment of the rural economic structure in China. At present, many farms have begun to carry out reforms to meet the needs of the times. However, due to the lack of a complete set of management programs and the lack of good management awareness of managers, the efficiency of breeding is not high, the labor cost is high, and there is a big gap with developed countries. With the development of science and technology, China's aquaculture is developing in the direction of highly intelligent. Intelligent aquaculture has the characteristics of high value, high precision, low artificial, low energy consumption and so on. In the process of livestock growth, the environment is very important and difficult to control. If the traditional manual control method is used, the workload is large and easy to produce large data errors, which will greatly affect the production efficiency of the farm. The establishment of an automatic environmental monitoring system plays an important role in promoting the intellectualization of aquaculture.

At present, the aquaculture industry requires effective real-time control of environmental parameters such as humidity, temperature and light. Cornish proposed a set of intelligent agricultural environment monitoring system database based on ZigBee wireless communication technology, embedded system and network. The system can monitor the humidity, temperature and light intensity of the farm in real time, and store the corresponding data in the database, so that the future query and data playback system can also set the upper and lower limit values of various parameters to realize the staff When alarming, the staff can adjust the environmental parameters through the field or remote control to ensure the normal state of the farm. Cornish's research can provide a cost-effective and stable monitoring solution for farmers, but there are still some deficiencies in economy, which need to be improved [1]. Gaazi proposed a ubiquitous data model of livestock and poultry farms based on wireless sensor network. The sensor node can sense the data before and after, and provide intelligent services for users by using the environment and situation information of livestock and poultry farms to create the optimal livestock and poultry breeding environment. In this way, the production cost can be reduced and high-quality agricultural products can be produced High productivity. The model proposed by gaazi has some difficulties in practical application, and its feasibility is not high [2]. At present, many developed countries and developing countries are using the intelligent farm monitoring system to check the farm remote. For this reason, Cai proposed a target detection technology, which can further identify the target as a bird through template matching, skeleton extraction, contour extraction, edge extraction and so on. Cai tested the efficiency of the scheme, and the result shows that the system has a low false-positive rate And false negative rate, high desirability [3]. In order to make full use of the balcony space, Nishimura designed an intelligent balcony farm controlled by a single chip microcomputer. The system uses many kinds of sensors to collect the living conditions of plants, including light intensity, air temperature and humidity, liquid temperature and pH value. PID algorithm is used to control heating, humidification, lighting, fan, etc. the system uses water pump and other equipment. Through the combination of environmental control, growth monitoring and visualization, a complete plant cultivation system is established. The system has the advantages of real-time control, GSM information alarm and GPRS wireless communication service. After testing, the system meets the design requirements, but there are still some defects in the accuracy, which need to be improved [4-5].

With the development of artificial intelligence, artificial intelligence has been used in many aspects, and aquaculture industry is no exception. In intelligent farms, environment is very important for livestock, so environmental monitoring is of great significance. In this paper, ZigBee technology and wireless Internet of things technology are used to realize the intelligent livestock environment monitoring system. The system is equipped with carbon dioxide monitoring, temperature and humidity monitoring and light monitoring to monitor the livestock environment, and experimental tests are carried out, which shows the application of artificial intelligence technology in intelligent farms. In addition, this paper also discusses the application of artificial intelligence technology in intelligent farming The application in the field is prospected, and the promising technology application in the future is put forward.

## 2. Related Technologies of Intelligent Farm

### 2.1. ZigBee Technology

ZigBee technology is a communication technology developed on the basis of IEEE802.15.4. ZigBee protocol adopts multi-layer structure, each layer provides data transmission service and management service for higher layer [6]. ZigBee's multi-layer architecture is defined based on the seven layer OSI model. IEEE802.15.4 defines the physical layer, MAC layer, network layer (NWK) and application layer (APL) architecture. The application layer consists of three parts: application support sub option (APS), ZigBee device object (ZDO) and application framework [7].

(1) Network layer

As the core layer of protocol stack, network layer is between MAC layer and application layer. The main functions of the network layer are:

First, it provides the mechanism used by the device to connect and disconnect the network and the security mechanism of frame information in transmission.

Second, route discovery and route maintenance and transfer of equipment.

Third, discovery of neighbor devices and storage of related node information.

Fourth, assign short addresses to the newly added devices.

Fifthly, ensure that ZigBee's MAC layer works normally and provide appropriate service interface for application layer. The network layer includes data service entity (NLDE) and management service entity (NLME), which can better communicate with the upper layer.

(2) Application layer

In ZigBee protocol, application layer can be composed of three parts: application support sublayer (APS), ZigBee device object and application framework. It provides links to network level and application level through ZigBee device (ZDO) object and a set of services used by application program. APS sublayer provides data transmission services and management services for service application delivery data entity (apsde) and management entity (apsme), data service (apsde) and management service (apsme) entities through their respective physical points. In addition to providing management services, apsme is also responsible for maintaining APS database (AIB) [8].

In addition to providing data services at the network layer, apsde also provides services to transfer application data units between ZDO and other application devices to the same network. The management services provided by apsme include AIB management, security management and allowing applications to connect to ZigBee system. The APDU of APS sublayer includes APS frame header and payload APS. The APS framework chapter consists of two parts, framework control and address information. The payload APS is the data information of APS sublayer, and its length is variable [9].

According to the different communication capabilities of the devices, IEEE802.15.4 divides the devices on the network into full function devices (FFD) and reduced function devices (RFD). FFD can communicate with all devices on the network, but RFD can only communicate with FFD. RFD has simple functions and is generally used as a network communication terminal. FFD usually has network control and management functions on the network. According to all kinds of tasks undertaken by devices in the network, devices in IEEE802.15.4 network can be divided into pan coordinator, coordinator and general-purpose devices. The coordinator is the central node of the network. He is mainly responsible for the creation and maintenance of the network, as well as the management of identity, upgrade package and status information of other members of the network. There can only be one central node in the network, that is, only one coordination. The router is mainly responsible for network expansion and routing information transmission. It only exists in the tree and grid structure. The terminal equipment is mainly responsible for data collection, without auxiliary nodes [10].

As we know, both network coordinator and router are FFD, but network terminal equipment (FFD) can also be RFD. On the other hand, ZigBee network can support three kinds of network topologies: star structure, mesh structure and tree structure.

1) In a star topology, all devices communicate directly with the central node coordinator. We know that there is no router routing function in this network structure. This structure is relatively simple and less flexible. In contrast, it is more suitable for simple and small-scale applications.

2) Grid network is the most complex topology. In the range of wireless communication, two FFDS can communicate with each other, and each FFD can be regarded as the network packet of routing application router. In this way, the transmission path of any two nodes on the network is not unique, which can improve the reliability of the network. Because of this, this kind of structure is more suitable for a wide range of applications.

3) Tree topology can be regarded as a complex star structure. The tree structure keeps the simplicity of the star structure and expands the network through the switch. There is only one transmission route between the information source and the target device. In this structure, the function of coordinator, router and terminal equipment is very clear, which can realize routing and upgrading function network, thus expanding the communication range of the network.

### 2.2. Wireless Sensor Network Technology

Sensor is a kind of detection device which can detect the tested information. It can meet the requirements of information transmission and processing, and has the functions of storage, display, recording and inspection. WSN system consists of sensor node, sink node and task management node. A simple WSN consists of a large number of sensor nodes arranged in the monitoring area to transmit the collected data to the aggregation node and then to the management node through the gateway through different networks. You can also reverse the management control of WSN. Nowadays, WSN technology is widely used in many fields such as home furnishing, agriculture, medical treatment, breeding and so on [11-12]. According to different working principles, measurement circuit and auxiliary power supply can be added if necessary. According to different working principles, it can be divided into chemical sensor and physical sensor.

WSN technology is very practical in intelligent aquaculture network, and its technical advantages are mainly reflected in the following two aspects:

(1) The introduction of WSN greatly reduces the installation cost and installation cycle of intelligent aquaculture. Compared with wired network WSN, it can avoid wiring, facilitate layout and expansion, and do not need to consider the problem of communication line aging, which is the biggest advantage of WSN technology.

(2) Managers can access to the intelligent breeding network through mobile devices to achieve remote monitoring.

## 3. Realization of the Environment Monitoring System of the Intelligent Farm

The environmental management of livestock house mainly stores the internal environmental information of livestock house in the farm, including the information of temperature, humidity, illumination, ammonia, hydrogen sulfide, carbon dioxide and time, which is convenient for users to view at any time. Because each farm has one or more barns. One or more environment sensing nodes are installed in each livestock house, so the stored environment data is the parameters after data processing.

### 3.1. Overall Design of Sensing Node

The design of environmental sensing node adopts the design concept of low power consumption and general equipment idea, which not only meets the requirements of low energy consumption in breeding environment, but also can achieve the plug and play of equipment, and can be easily and flexibly configured on demand. With the help of the universality of hardware design, the device can work in accordance with the mode of acquisition node when loading the environmental parameter sensing sensor, and the device can work in accordance with the mode of coordinator when loading the DTU data transmission device. The program can judge the working mode of the device independently, and ensure that there is only one coordinator device in a perception network for data transmission after wireless networking.

(1) Temperature and humidity sensor

AM2302 temperature sensitive capacitor digital output temperature and humidity sensor is selected as sensing node temperature and humidity sensor. AM2302 is a small low power consumption sensor, which can be transmitted in a long distance and calibrated automatically. It meets the design goal of environmental parameter sensing node. Single bus is one of the characteristics of the sensor. All data exchange functions and control functions are completed by bus.

(2) Carbon dioxide sensor

MH-Z14 carbon dioxide sensor is selected as the sensing node carbon dioxide sensor. The detection principle of the sensor is to use the non-dispersive infrared principle to sense the carbon dioxide in the air, which has no oxygen dependence and long service life. Moreover, the sensor can carry out temperature compensation. The output of MH-Z14 is analog signal, and its response is not more than 25s, which conforms to the design goal of the system. NDIR, non-dispersive infrared technology is one of the methods of infrared absorption and detection of gases. The principle is that different gases selectively absorb fixed length infrared light according to their own different molecular structures to form their unique infrared spectrum. According to this spectrum, we can judge their types, and calculate their concentration according to the attenuation degree of infrared light passing through the gas. In the actual application process, temperature has a great influence on the measurement of carbon dioxide gas, so we should choose the equipment with built-in temperature sensor, which can carry out temperature compensation.

The ideal gas equation is:

$$PV = nRT \tag{1}$$

It can be seen from the above formula that the concentration of the gas changes with the change of temperature. If the temperature increases, the molecular entropy of carbon dioxide increases and the absorption capacity of infrared light increases. Moreover, the change of temperature will also bring the change of infrared wavelength, which will affect the accuracy of measurement.

(3) Illuminance sensor

BH1750FVI16 bit digital output illuminance sensor is selected as the illuminance sensor of the sensing node. The sensor supports i2cbus interface and has very high sensitivity. The range of input light is 1-65535lx. Infrared has little influence on it and has low dependence on light source. The sensor is mainly composed of photodiode, integrated operational amplifier, analog-to-digital converter and register. The power supply voltage of the sensor is 3-5v, and low current can be achieved by reducing the power function, which conforms to the overall design of low power consumption.

### 3.2. ZigBee Wireless Sensor Network Design

The network structure of ZigBee wireless sensor network consists of one network coordinator and multiple routing nodes. The environmental data of all routing sensing nodes are sent to the coordinator, and then uploaded to the remote server by the coordinator through GPRS DTU.

(1) Networking and communication process

After the power of the system is turned on, the coordinator node in the wireless sensor network receives the information of each node sent by each environmental parameter multi-source sensing node, including address information, etc. Then the coordination node establishes the overall network topology. The information of each environment parameter aware routing node is stored in a structure, which includes the message header, tail and its device network address.

(2) Low power design

Because the sensor nodes all use the battery and adapter hybrid power supply, if it has been in the working state, it has a great impact on the battery power and life, so the system is based on the design idea of low power consumption, because in the actual environment parameter collection process, the data collection is periodic collection, the routing node collection cycle is 10 minutes, the system uses the sleep wake-up mechanism. After the establishment of the network, scan the channel and other steps are carried out, and then the routing node sends the join request. After the end of the data receiving and sending process, the routing node enters the sleep state, and after the cycle time, the environment parameter perception router wakes up again.

The energy consumption is mainly in the communication between nodes. The energy consumption of the transmission data is concentrated in the transmission circuit and power amplifier. The energy consumption of the received data is in the receiving circuit. Then the energy parameter formula is:

$$E(n)=\frac{E_{n-current}}{E_{n-\max}} \tag{2}$$

Where $E_{n-current}$ represents the remaining power of the nth node; $E_{n-\max}$ is the initial energy of the node. Then the energy consumption of data received by the node is:

$$E_{RX}(k)=E_{elec}\times k \tag{3}$$

## 4. Experimental Design

### 4.1. Subjects and Equipment

(1) Subjects

In this paper, an intelligent farm is selected as the test object. The animals in the intelligent farm are pigs. The direction of the livestock house is south, the length of the livestock house is 100, the width is 15 meters, the space between the houses is 35 meters, the two sides are fenced, and about 20 pigs are raised in the house. There are windows on the north and south walls of the pigsty, and two doors on the East and west sides, which play the role of ventilation and lighting.

(2) Experimental equipment

1) Sensor selection

The environment sensing nodes in this paper are equipped with environment parameter sensors, Temperature and humidity sensor, illuminance sensor and carbon dioxide sensor are respectively selected. AM2302 temperature sensitive capacitor digital output temperature and humidity sensor is selected for sensing node temperature and humidity sensor, MH-Z14 carbon dioxide sensor is selected for carbon dioxide sensor, and BH1750FVI16 digital output illuminance sensor is selected for illuminance sensor.

2) Other experimental equipment

Notebook computer: 4G memory, Intel corei5 processor, 250g solid state drive, Microsoft Windows 10 operating system and wireless mouse.

Hardware circuit: touch screen, main control unit, sensing unit and execution unit.

Debugging tool: USB serial port cable.

### 4.2. System Test

(1) Function test

The outdoor temperature of the test time selected in this paper is about 25 ℃, and three sensor nodes are installed in the barn, including two bit routing nodes and one coordinator node. Node 1 is installed on the right side of the barn door, with a height of 1.5m from the ground; node 2 is installed on the wall in the middle of the barn, with a height of 2m from the ground; node 3 is installed on the wall in the south of the barn, with a height of 1.5m from the ground. The data measuring instrument of the control group is an industrial environmental parameter measuring instrument. The carbon dioxide, temperature and humidity are measured synchronously by HT-2000; the illumination is recorded regularly by illuminance recorder.

The test period of the system is 15 days, and the time interval of data upload is 10 minutes. The server analyzes the data according to the data uploaded by the central node, and then obtains the real-time environment parameters.

(2) Performance test

In order to show the advantages of this system, the system performance test, the response time and energy consumption of the system are tested. The response time test of this paper compares the actual test value with the expected value, and the energy consumption test selects a monitoring system as the control system for comparative analysis.

## 5. Analysis and Prospect of Experimental Results

### 5.1. Function Test

(1) Carbon dioxide test

In this paper, carbon dioxide sensor is used to collect the change of carbon dioxide. The parameters of carbon dioxide sensor are shown in Table 1. The average of the collected environmental parameters is processed, and the change of carbon dioxide concentration is shown in Figure 1.

*Table 1. Relevant parameters of carbon dioxide sensor*

| Parameter name | Parameter value |
|---|---|
| Measuring range | 0-5000ppm |
| Accuracy | ±50ppm |
| Repeatability | ±30ppm |
| Working temperature | 0-60 ℃ |
| Working humidity | 0%-90%RH |
| Working voltage | 4-6V |

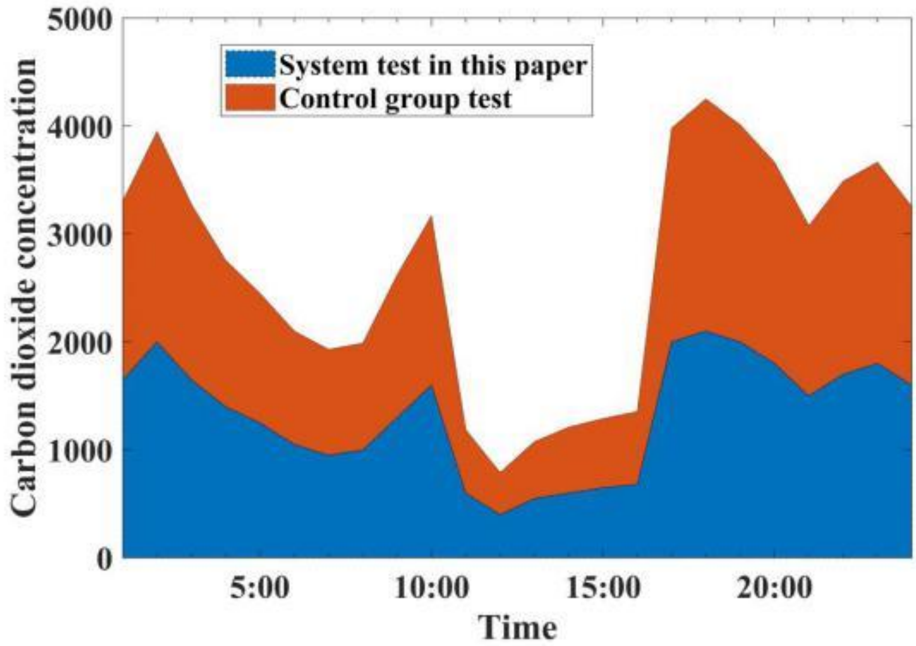


*Figure 1. Concentration change of carbon dioxide*

It can be seen from Table 1 that the relevant parameters of the carbon dioxide sensor selected in this paper can be seen from Figure 1 that the carbon dioxide concentration changes within 24 hours, so the difference between the daytime and night carbon dioxide content in the livestock house is relatively significant. Before 7:00 and after 20:00, the carbon dioxide concentration is above 1200 ppm, while between 22:00-3:00, Except that the maximum concentration of 1500 ppm is lower than the national standard at some times, the rest is generally higher than the national standard. In addition, from the figure, the difference between the carbon dioxide concentration measured by the system in this paper and the carbon dioxide concentration measured by the industrial level environmental parameter tester is not obvious, so it can be seen that the accuracy of the system in this paper in the carbon dioxide concentration test is quite high.

(2) Temperature and humidity test

The relevant parameters of the temperature and humidity sensor are shown in Table 2. Then the relationship between the temperature and humidity measured by the system and the industrial environmental parameter tester is shown in Figure 2.

*Table 2. Parameters of temperature and humidity sensor*

| Parameter name | Temperature parameter value | Humidity parameter value |
|---|---|---|
| Resolving power | 0.1% | 0.1% |
| Accuracy | ±0.5% | ±2% |
| Repeatability | ±0.2% | ±0.3% |
| Response time | <10s | <5s |
| Hysteresis | <0.3% | <0.3% |
| Working voltage | 3.5-5.5V | 3.5-5.5V |

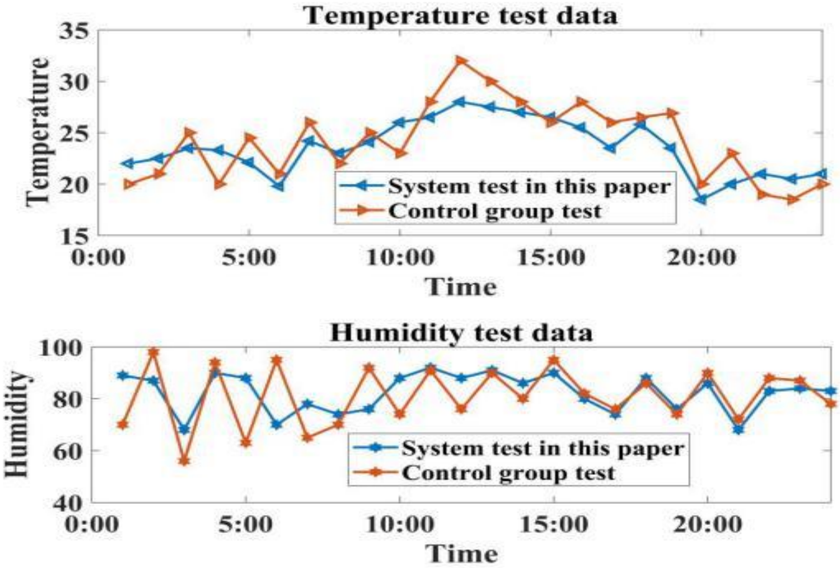


*Figure 2. Temperature and humidity test data*

It can be seen from Table 2 that the accuracy of temperature and humidity sensor is high and the error is small. It can be seen from Figure 2 that the average maximum temperature and minimum temperature in the house can reach 32 ° C and 19.5 ° C respectively. The overall trend of temperature in the house is on the high side, and the cooling condition of the livestock house is poor. In addition, between 2:00-3:00 and 6:00-7:00, the relative humidity reached about 60%. In the rest of the period, the relative humidity generally reached more than 70%, far higher than 60% - 70% of the optimal relative humidity of the livestock house. Due to the relatively simple production conditions, the necessary measures could not be taken for the situation of high relative humidity, which was not conducive to production. In addition, it can be seen from Figure 2 that the test results of the system in this paper are quite different from the temperature and humidity results measured by the industrial environmental parameter tester, and the accuracy in this respect still needs to be improved.

(3) Light test

The relevant parameters of the light sensor are shown in Table 3, and the illumination test data are shown in Figure 3.

*Table 3. Relevant parameters of illuminance sensor*

| Parameter name | Parameter value |
|---|---|
| Measuring range | 1-65565lx |
| Minimum error variation | ±20% |
| Supply voltage | 4.5V |
| Reverse current | 7mA |
| Storage temperature | 40-100 ℃ |
| Temperature range | -40 ℃-85 ℃ |

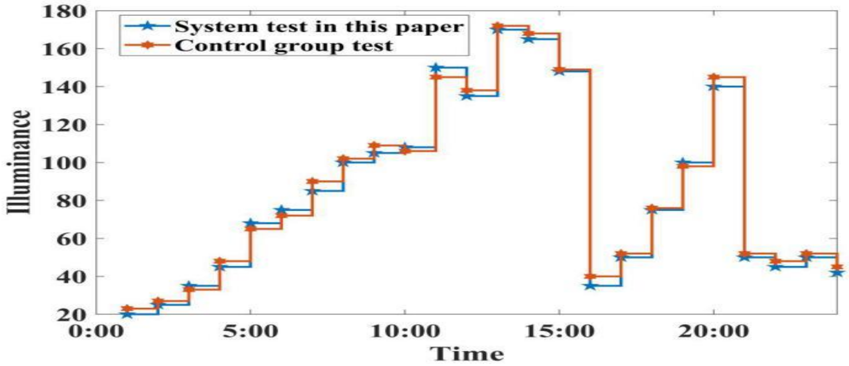


*Figure 3. Illuminance test data*

The relevant parameters of the light sensor can be seen from Table 3. It can be seen from Figure 3 that the light intensity changes greatly at night and in daytime. Influenced by the artificial light source at night, the light intensity fluctuates slightly, meeting the requirements of no less than 50lx for the internal light intensity of daytime livestock house in NY / t388-1999. In addition, the test results show that the test results of this system have high accuracy.

### 5.2. Performance Test

(1) Energy consumption

The energy consumption of this system is compared with that of other monitoring systems, and the results are shown in Figure 4.

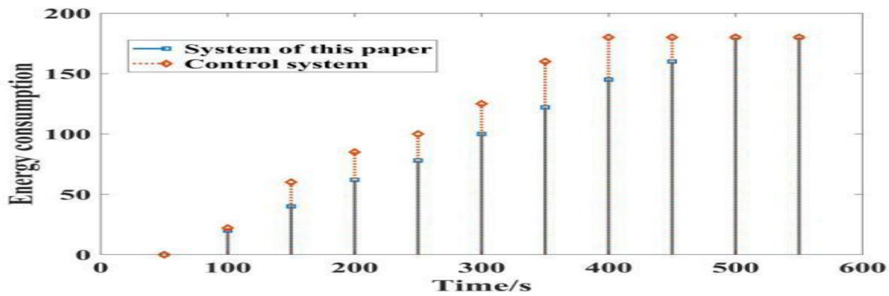


*Figure 4. Energy consumption analysis*

It can be seen from Figure 4 that compared with the control system, the energy consumption of the system in this paper is 180 seconds, while that of the control system is only 400 seconds. It can be seen that the system in this paper has advantages in energy consumption, low power consumption, energy conservation and environmental protection.

(2) System response time

The system response time of this paper is tested, and the actual results are compared with the expected results, as shown in Figure 5.

It can be seen from Figure 5 that when the number of nodes is 1, the actual response time of the system is 0.38s, the expected value is 0.4s, when the number of nodes is 2, the actual response time of the system is 0.42s, the expected value is 0.45s, when the number of nodes is 9, the actual response time of the system is 0.76s, the expected value is 0.85s, when the number of nodes is 10, the actual response time of the system is 0.78s, and the expected value is 0.9s, With the increase of the number of nodes, the response time of the system increases correspondingly, but it never exceeds the expected value. That is to say, the response time of the system is actually faster than expected, and the more nodes, the more the system exceeds the expected value.

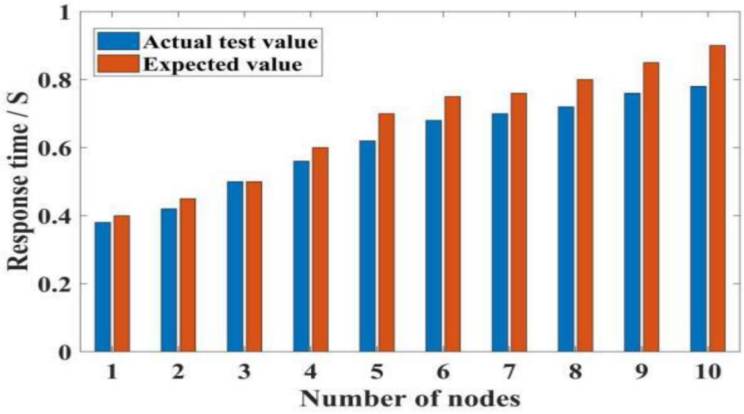


*Figure 5. System response time*

### 5.3. Prospect of Artificial Intelligence Technology in Intelligent Farm

The development of animal husbandry depends on the progress of science and technology, the improvement of mechanization level, the promotion of industrialization by mechanization, and the improvement of production and quality, so that animal husbandry can become an industry with high scientific and technological content and organizational management level. With the development of science and technology, artificial intelligence technology is expected to be applied in fine feeding, scientific breeding, feeding environment monitoring, epidemic situation monitoring, disease control and animal product traceability. The application of artificial intelligence technology in intelligent farm is expected to realize the following aspects in the future:

(1) Intelligent perception control system of farm

Using the Internet of things technology to understand the breeding environment parameters, realize the continuous real-time reproduction monitoring of video technology, and create a panoramic video monitoring system. Through the three-dimensional image fusion technology, the system can seamlessly connect the images of different positions and angles, so that the functions of breeding management, disease early warning, real-time development data and decision support can be implemented.

(2) Animal health monitoring system

The implementation of this system is based on wearable device technology, It can continuously and real-time collect animal health and other information, based on image recognition, realize individual recognition, motion detection, individual monitoring and other functions, thus it can monitor animal shape parameters, predict animal weight, help farmers calculate growth speed, predict animal health status, on the other hand, it also has a guiding role in epidemic early warning.

(3) Automatic feeding system

The automatic feeding system includes the automatic feeding system and the automatic feeding system of the pig farm. This system can realize the full automatic control of the feed from the warehouse to the feeding tower, then to the pig house and the feeder. In addition, the fine feeding system of the cow and the feeding robot can combine the automatic identification system and the nutrition management system of the cow, so as to realize the high-efficient accurate feeding of the cow.

(4) Animal products harvesting robot

Animal products harvesting robots, such as automatic milking robots, can automatically complete cow recognition, breast scanning and positioning, highly bionic milking, can detect protein, fat, sugar and temperature, can also measure and record the cow's physique, milk production, milking time and other production parameters, so as to reduce the frequency of cow's illness.

(5) Intelligent management system of biosafety in farm

It includes farm personnel management, vehicle disinfection and equipment management, harmless management of dead animals and biosafety management software, so as to realize quarantine and isolation, sanitation and disinfection, prevention and control of mosquitoes and other harmful animals, harmless treatment of sick pigs, etc.

(6) Intelligent waste disposal system

The intelligent fecal sewage treatment system can transform the harmless sewage treatment system, through the transformation of the fecal sewage treatment facilities in the breeding farm, as well as the application of livestock and poultry breeding environment monitoring alarm, quantitative feeding and automatic fecal cleaning, so as to realize the environmental remote monitoring and control and other links, and get the personalized, intelligent and precise control system.

## 6. Conclusion

With the development of science and technology, the application of artificial intelligence technology involves all aspects of life and production. This paper studies the application and Prospect of artificial intelligence technology in intelligent farm. In order to highlight the application of artificial intelligence technology in intelligent farm, this paper designs an intelligent farm environment monitoring system based on ZigBee technology and wireless Internet of things technology.

In order to verify the intelligent livestock farm monitoring system of this paper, the function test and performance test are carried out in this paper. In the function test, the carbon dioxide monitoring, temperature and humidity monitoring and light monitoring function modules designed in this paper can be basically realized. Except for the slight error in temperature and humidity test, the other function accuracy is relatively high.

On the other hand, in the performance test, the experimental results show that the system has the advantages of short response time and low energy consumption. At the end of this paper, the application of artificial intelligence technology in intelligent farm is prospected. Artificial intelligence technology is expected to be implemented in fine feeding, scientific breeding, feeding environment monitoring, epidemic situation monitoring, disease control and animal product traceability.

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## Data Availability

Data sharing is not applicable to this article as no new data were created or analysed in this study.

## Conflict of Interest

The author states that this article has no conflict of interest.

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