

## **Implement of Intelligent Community Sensor Network Node**

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*Abstract: The intelligent wireless sensor installed in the vehicle, intelligent cell information collection point, through the wireless can perceive the surrounding temperature, humidity, light, location, acceleration, magnetic field and other information. In this kind of wireless sensor node, the CPU, the wireless communication module, the antenna, the sensor control circuit and the power supply are integrated at the same time, so that the wireless sensor node has the function of cooperating with the peripheral sensor node to form the wireless sensor network.*

*Keywords: WSN, sensor network, node*

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### **1. INTRODUCTION**

The wireless sensor network WSN (Wireless Sensor Network) technology and embedded technology, network technology to achieve the intelligent community within the vehicle management and control, greatly improving the intelligent community within the vehicle management efficiency. Each sensor is installed on each vehicle in the intelligent cell, and each sensor is treated as a node for data acquisition and transit and routing. The cell is formed with a wireless sensor network consisting of several wireless sensor nodes. Each node that is, information collection points can also be information transmission and routing points.

Each node through the wireless communication technology to vehicles, parking spaces, vehicle controller and other related data connected with the Internet for information exchange and communication, in order to achieve intelligent identification, positioning, tracking, monitoring and management, greatly improving the district Information and intelligence.

The design and implementation of the intelligent community vehicle management system, including: access management, monitoring and security, parking and parking management, vehicle remote controller management and system network management. In order to speed up the community to provide the theory and practice of intelligence [1].

### **2. PROPERTIES**

With the rapid development of high-performance micro-device design technology and wireless

mobile communication technology, even if the user is not identified, all kinds of information equipment and other equipment can intelligently form a network, is actively at any time, any place can It is easy to provide users with information on the ubiquitous computing (Ubiquitous Computing) of the discussion [2]. In order to realize this future in the computing environment, wired and wireless networks, fixed networks and mobile networks and other network interconnection as a whole, the use of peripheral equipment and home appliances, can intelligently provide users with information and computing functions The Moreover, in order to use pervasive computing more effectively in daily life and industrial production, research and commercialization of the Ubiquitous Sensor Networks [3], which can predict the patterns of the surrounding environment and human activities, are in urgent need Of the period. The information that is perceived by the pan-sensor network can automatically identify the services and surroundings required by the user and provide a more convenient and accurate service. One such sensor networks work great as MIT Technology Review selected "change the future of the world's top 10 emerging technologies," engaged in active research in leading universities more advanced countries of Chiang Kai-shek. In this case, the wireless sensor network in the field of human live and field research more urgent, the project has analyzed the characteristics of the sensor network has been studied, and based on the design and implementation of the wireless sensor network based on the intelligent community Vehicle management system [4].

Node chip, the world's leading chip manufacturers such as TI, Atmel's processor chip, Chipcon's wireless transmission chip, etc. have mass production. Software, many well-known companies for the node network development of the software protocol stack, California Berkeley University research and development node network dedicated operating system TinyOS, wireless sensor network for the formation and other aspects of the test research provides the basis.

China's modern sense of the wireless sensor network and its application research almost started with the developed countries, in 1999 for the first time in the Chinese Academy of Sciences, \"the field of knowledge innovation project pilot research\" in the field of information and automation research report, as the field One of the five major projects. With the deepening of the knowledge innovation pilot project in 2001, Chinese Academy of Sciences relying on microsystems research and development centers set up by Shanghai Microsystems, leading hospital-related work, and through the centers have deployed a number of significant research in the direction of wireless sensor networks project and direction program, participating units include Shanghai Microsystems, Acoustics, Microelectronics, semiconductors, Electronics, software, USTC, more than ten of the school, the initial establishment of sensor network systems research platform in the wireless smart aspect sensor network communication technology, micro-sensors, sensor nodes, clusters of points and applications has made great progress, in September 2004 related to the results of a large-scale field demonstration in Beijing, some of the results have been used in practical engineering systems [5].

### 3. CONDITION TESTS OF ROUGHER FLOTATION

#### (1) Wireless sensor node hardware design and implementation

In order to build the vehicle in the intelligent community in the wireless sensor network, each sensor node needs to have both sensor and computing functions. The system used to select the control unit 8051 MCU and CC2420 RF transmission chip combining SoC TI CC2431, to support the use of TI CC2431 ZDK Zigbee protocol, and TinyOS 2.x achieved by real-time sensor networks. Under the control of CC2431, select different sensors to achieve different data collection, such as temperature, humidity, illumination, infrared, RFID sensors. The system chooses a disposable dry battery as a power supply for the sensor node. In the above hardware platform design and implementation of each sensor node.

#### (2) Wireless sensor node software design and implementation

In the above sensor node hardware platform to develop the node node program, the system uses wireless sensor network dedicated operating system TinyOS and TinyOS under the form of component structure (component) structure NesC language to develop node program. Since the sensors configured for each sensor node are different, different programs are programmed for different sensors for data acquisition and wireless transmission. Finally, the corresponding node program download to the corresponding sensor node to achieve the data acquisition function.

Each sensor node is the collection point of information, but also the transmission and transmission of data transmission point, so the sensor node should also be prepared in the corresponding routing algorithm, and data transmission protocol, this part of the work is also a lot of work, is the key point of wireless sensor network design.

#### (3) Embedded gateway design and implementation

In order to achieve wired and wireless communication, convergence, the data sent by the wireless node through the intelligent cell embedded gateway or intelligent home embedded gateway protocol conversion, and sent to the Ethernet through the Ethernet control host, while the host command through the embedded Type gateway to wireless commands (zigbee, GPRS, Bluetooth, etc.) to the wireless sensor node.

Design and implementation based on S3C6410 microprocessor and embedded Linux3.0.1 intelligent cell gateway, the focus is the Linux protocol conversion software programming.

#### (4) Sensor network routing protocol and MAC protocol research

Based on the analysis of the common routing techniques of sensor networks: planar routing, location-based routing and hierarchical routing, the routing algorithms suitable for the system are selected and improved, and the advantages and disadvantages of various algorithms are analyzed theoretically.

Based on the study of commonly used wireless MAC protocols: CSMA / CA, TDMA and CDMA, we choose and improve the wireless MAC protocol suitable for the system, and strive to reduce the energy loss of the system.

#### (5) Wireless sensor network analysis

Research and analysis of the system set up the performance of wireless networks and optimize and improve.

#### **4. CONCLUSION**

The system uses from the bottom to the top, from hardware to software, the overall design and development program. That is, from the bottom of each sensor to start, combined with CPU (8-bit microcontroller), TinyOS using NesC programming wireless sensor network to achieve each sensor node. Each cell in an intelligent cell can be considered a wireless sensor node.

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