Construction of Vehicle Networking Based on Intelligent Transportation Internet of Things

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Abstract. The development of intelligent transportation will change to the management mode which focuses on hot spot area and takes vehicle as the object. Therefore, it is urgent to establish an information system based on vehicle nodes. The vehicle networking means that the electronic tags loaded on the vehicle can extract and utilize the attribute information of all vehicles on the platform of information network through wireless identification technology. And according to different functional requirements of all vehicles to effectively monitor the state of operation, but also provide comprehensive services. The paper presents construction of vehicle networking based on Intelligent Transportation Internet of things.

Introduction

From technology research and development, system integration, production installation to the promotion and application of a complete intelligent transportation industry cluster. Comprehensive use of all kinds of high and new technology to achieve intelligent monitoring and management of people, vehicles, roads, and traffic and transportation, realize the perception of road information (traffic congestion, major events, public transport, parking information, Environment (tail gas) and weather etc.

The data transmission system which integrates three networks, such as Internet, radio and television network and 3G antenna network, can realize real-time road condition and data exchange and transmission at any time and place [1]. Give full play to the effective value of the data information, send the data information to the corresponding departments and user groups in time, provide the best route for the drivers and citizens of motor vehicles; It provides the reference and basis for the government and related departments to deal with emergency and traffic road command and future development.

These factors seriously restrict the development of urban traffic informatization in China. Road congestion, traffic jams and traffic disorder are common in large and medium-sized cities across the country. To sum up, at present, our urban traffic mainly presents the following characteristics and problems: the city scale expands step by step, the transportation pressure is heavy, the motor vehicle growth is accelerated, the road capacity is insufficient, the road network is unreasonable, the traffic management level is low; the public transportation shrinks, the travel structure is unreasonable.

After analysis, processing and optimization of the comprehensive traffic management scheme and traffic service information [2]. Through the data communication transmission equipment to each kind of traffic control equipment and the traffic system each kind of user respectively, or through the release equipment serves for the road user, realizes the omni-directional optimization management and the control to the city traffic, To provide all kinds of users with comprehensive traffic information services.

The intelligent transportation system is also produced to solve the traffic problems caused by motorization in today's society and the direct decline of economic, social, ecological and external

benefits. Therefore, the goal of the intelligent transportation system should reflect the society and economy. The benefits of the three levels of ecosystem are improved.

National ITS architecture, as a framework for guiding the design of national ITS, must be widely recognized by engineers and investors throughout the country in order to truly play its role. Therefore, national ITS architecture must be readable so that more people can understand it and discuss it. Moreover, if we develop I in an object-oriented way TS logical structure, in determining the "object" set will encounter a lot of trouble, because ITS is a complex large system.

Intelligent Traffic Control System Based on MCU

The vehicle detector used at that time was a pneumatic rubber tube detector [3]. The characteristic of the vehicle sensor controller is that it can adjust the green time according to the traffic flow measured by the detector, so that the green time can be used more effectively and reduce the time delay of the vehicle at the intersection. This characteristic of vehicle induction control stimulates the development of vehicle detector technology. After the pneumatic rubber tube detector, radar, ultrasonic, photoelectric, geomagnetic, electromagnetic, microwave, infrared and annular coil detector has emerged.

ITU expanded the concept of the Internet of things in its report "The Internet of Things", presenting a vision of interconnection between objects at any time, anywhere, between any object, an omnipresent network and ubiquitous computing, with the exception of RFID technology, sensor technology, Nanotechnology, intelligent terminal and other technologies will be more widely used.

The P1 port is an 8-bit bidirectional I / O port P1 port buffer with internal pull up resistance, which can receive the output 4TTL gate current [4]. P1 port pin is written into 1 and is pulled up to a high level by the inside. It can be used as an input for the P1 port to be pulled down from the outside to a low electric current, and the output current can be transferred to the output current. This is due to internal tension. The P1 port is received as the eighth bit address during FLASH programming and verification.

Intelligent Transportation system (its) is widely used in developed countries such as Europe and America. According to the application of intelligent transportation system, it can effectively improve the efficiency of transportation, as is shown by equation(1), where D reduce traffic congestion by 20 percent, reduce delay losses by 10-25 percent, reduce traffic accidents by 50-80, reduce fuel consumption by 30 percent [5].

$$
\begin{cases}
D_{j,F}^{\xi}(m,n) = w_{j,\max}^{\xi}(m,n)D_{j,A}^{\xi}(m,n) \\
+ w_{j,\min}^{\xi}(m,n)D_{j,B}^{\xi}(m,n) \quad E_{j,A}^{\xi}(m,n) \geq E_{j,B}^{\xi}(m,n) \\
\\
D_{j,F}^{\xi}(m,n) = w_{j,\min}^{\xi}(m,n)D_{j,A}^{\xi}(m,n) \\
+ w_{j,\max}^{\xi}(m,n)D_{j,B}^{\xi}(m,n) \quad E_{j,A}^{\xi}(m,n) < E_{j,B}^{\xi}(m,n)
\end{cases}
\tag{1}
$$

8051 reset mode can be power-on reset, can also be power-up button reset, see below. In addition, RESET / VPD is also a multiplexing foot during which VCC power is lost, which can be connected to a backup power supply to ensure that the data of the RAM inside the MCU is not lost.

The market demand of the urban traffic management system will continue to grow in the future. The next few years will be the rising period of the development of intelligent transportation in China, which will have a positive impact on improving the utilization efficiency of urban transportation facilities, improving the service level of traffic system and promoting the traffic system of economy-oriented cities [6]. According to the development plans of provinces and cities, most cities in China are establishing mass transit roads and new rail transit in order to build a large public transport network.

Advanced navigation systems, safety aids, traffic management optimization systems, efficient road traffic management systems, bus support systems, vehicle operations management systems, and

it is pedestrian guidance systems and emergency vehicle support systems. ITS in Japan is mainly used in transportation information provision, electronic charges, public transport, commercial vehicle management and emergency vehicle priority.

A typical architecture development process essentially includes the first phase of the development process, using repeatedly modified development programs. Starting with defining users, defining user services and user service requirements, developing operational requirements or system requirements, and then developing operational concepts (architectural goals and how users interact with them), Develop a logical structure that contains a set of detailed functional requirements.

The traffic control system has basically completed the transition from the traditional traffic control system to the intelligent traffic control system (ITS), but in our country, the intelligent transportation system is just in its infancy [7]. For the traditional traffic control system, the traffic lights are usually controlled by timing, which can not identify and optimize the actual traffic flow, so it can not adapt to the uncertainty and randomness of traffic volume. It often causes waste of traffic resources and obstruction of roads. The intelligent traffic control system can effectively improve the efficiency without large hardware changes.

Floating vehicle acquisition technology is an important and beneficial supplement to fixed point acquisition technology. It realizes the whole flow of road network information collection (vertical section information collection), combined with fixed point collection (section information collection), can provide more comprehensive and rich data for the establishment of road network mathematical model. It provides a more accurate basis for road network state simulation.

Analysis of Intelligent Transportation Planning Based on Internet of Things

Set up an intelligent science and technology park demonstration project based on the Internet of things, through GIS, remote sensing, global positioning system, Broadband multimedia network and virtual simulation technology based on "high-definition digital integrated monitoring platform" to achieve high-definition digital intelligent park.

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Hardware design is the basis of the whole design. There are many aspects to be considered. In addition to realizing the basic functions of traffic lights, the following factors should be considered: system stability; Software programming is easy to implement; system other functions and performance indicators; so the hardware design is very important.

Intelligent transportation can significantly reduce car energy consumption. Through intelligent traffic control, because the increase of average speed brings about the reduction of fuel consumption and the reduction of exhaust gas; automobile fuel consumption can also be reduced by 15%. In terms of China's 70 million vehicle holdings, the annual consumption of gasoline can be reduced by about 25 million tons, accounting for more than half of the annual imports of refined oil products. At the same time, intelligent building information, intelligent building products, intelligent building industry dynamic traffic smooth will greatly reduce the vehicle on the road stagnation time, make vehicle exhaust emissions greatly reduced, thereby improving the air quality [9].

The UNIA logic structure decomposes ITS into eight functional "processing trees": traffic management, commercial vehicle management, vehicle monitoring and control, bus management, emergency service management, driver and traveler services, electronic payment services, planning and implementation.

The level of traffic management is still undeveloped. With the increasing demand for traffic, the modernization of traffic management and traffic safety facilities in small and medium-sized cities in China is insufficient. In vehicle, road and traffic management system, urban traffic signal control

system, the application of artificial intelligence technology in urban traffic control, information collection and information supply technology, there is a big gap with developed countries.

Secondly, the hardware circuit and display circuit of intelligent sensor are designed to select and connect each device, and to distribute the basic functional requirements of each device and module. The third is to design the software system. For this system, I use the assembly language of single chip computer to write, and do enough research on the internal structure and working conditions of the single chip, to understand the principle of timer, interruption and delay. On the whole, the software is written.

Traffic guidance screen information publishing subsystem mainly uses the outdoor large screen of urban trunk road to provide guidance for drivers, that is, the information board publishes the traffic status of part of the road network downstream of corresponding traffic nodes in real time, and provides real-time guidance for road users, and provides tracking feedback for traffic management measures.

Construction of Vehicle Networking Based on Intelligent Transportation Internet of Things

The establishment of urban bus management system not only allows passengers to enjoy the most convenience, but also provides a highly intelligent management platform for operators. By setting up electronic stop board to display the location information of the bus dynamically, it is convenient for passengers to master the waiting time and travel time in time, to make the transfer link more efficient, and to make the transfer scheme more predictable.

For example, 20 cars per lane in 20 seconds and 45 cars per is lane in 40 seconds. Because of this starting problem, there is also a yellow light waiting problem. That is to say, the longer the green light goes, the more vehicles per unit time pass.

The programming information in FPGA will be stored in each bit of Ram flip-flops in a dedicated static RAM, and programming information will be stored. When the system is powered on, the programming information is transmitted from the outside to these storage units, and FPGA can form the internal structure and connection according to the information to achieve the required functions.

The system realizes the two-way communication between the driver and the dispatching management center through the vehicle-mounted computer, as is shown by figure1. The height management center computer and the GPS satellite network, and provides the operation efficiency of commercial vehicles, buses and taxis. The communication ability of the system is very strong, and it can control the vehicles in the whole country and even in a larger range.
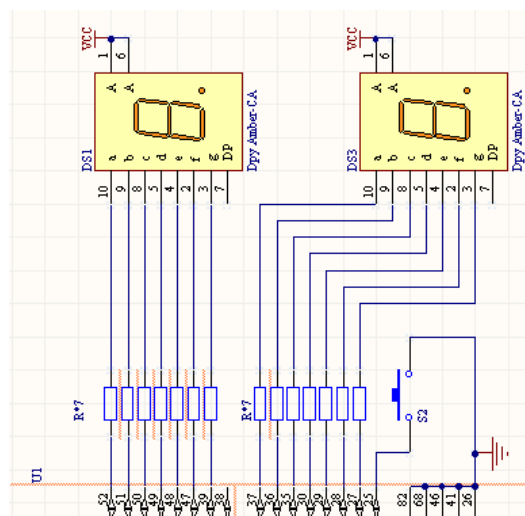

Figure. 1 Construction of vehicle networking based on Intelligent Transportation Internet of things

Sensor network technology is also used in traffic system monitoring and other applications. In recent years, developed countries in the United States, Japan and Europe are stepping up research on

intelligent traffic monitoring systems based on wireless sensor networks. For example, in 2004, Michigan University of Science and Technology proposed the use of wireless sensor networks for intelligent transportation, and simulated and tested the networking and information exchange between nodes. K. Xing and others proposed a new method of highway safety early warning based on wireless sensor networks. It caters to the goal of zero casualty, zero delay proposed by the ITS conference.

In addition to the development of RFID technology and sensor network technology, the development of 3G technology also brings solutions to the information transmission of its. The development of 3G technology and the commercial use of 3G network are the real-time transmission of information such as digital, voice and video images of its. Monitoring and scheduling plays an important role.

Summary

In this paper, the intelligent transportation Internet of things in a certain radius, to the mobile phone users who are in the area issued a circular message, received a good effect, did not cause serious congestion. In addition, on the basis of the advance text message, the traffic control department is planning to rely on the 3G mobile phone system to develop a road condition map warning information publishing system, which will forecast the traffic situation in real time and in minutes to days. Send it to a citizen's mobile phone in the form of an electronic map.

Acknowledgements

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