

# Research on Intelligent Vehicle Control System Based on WIFI Network

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**Abstract:** The development of science and technology has promoted the derivation and development of artificial intelligence technology. The application of artificial intelligence technology in automobile industry is mainly embodied in the research and development of intelligent automobile. Based on the WIFI network of intelligent car use is mainly through the combination of single-chip and wireless network data, through the mobile terminal to send instructions to achieve intelligent car according to the instructions to exercise, and can achieve image and other data transmission. This paper discusses and analyzes the control system of intelligent vehicle based on WIFI network technology.

**Keywords:** intelligent vehicle; control system; research

## Introduction

China's rapid development of market economy has brought people's living standards greatly improved, the car has become a family travel in the community essential means of transport. The use of car safety has become the public most concerned about the topic. It can be said that the development of smart cars to a certain extent, help reduce the car safety accidents and the probability of social crime. The development of Internet technology to promote the development of 2G network to the current stage of the 4G network, the increase in speed for Internet users to provide a great convenience, WIFI wireless network technology to promote the rapid development of the information age. Based on the WIFI network intelligent car to take full advantage of the wireless data network transmission function, to achieve the level of artificial intelligence of the vehicle.

## 1.Design of intelligent vehicle control system based on wireless data technology

The intelligent vehicle control system design system based on wireless data technology includes PC / handset PC, WIFI module / router, single chip microcomputer system, motor drive module and DC motor. The key part is PC, wireless module, lower computer and drive circuit. PC components from the PC / mobile phone, through the wireless channel and WIFI module connected between the two can be formed between the image or video transmission channels, the receiving module for the host computer. The host computer part through the Android mobile phone set up embedded system control, so as to establish the transmission platform for the instruction to the wireless network module to convert the data to the microcontroller, the microcontroller system and the motor drive system is through the interface to

achieve instruction data. The smart car executes the instruction after receiving the instruction, the host computer module sends the video request, the video module processing program in the wireless network module will transmit the image

obtained through the camera to the host computer port, carry out the relevant data decoding after the display <sup>[1]</sup>.

WIFI module simply through the wireless network port router modified a WIFI data transfer center, all the instructions or transmission through the module to achieve, so the WIFI module is the focus of the entire control system. The lower part of the intelligent control system in the intelligent car is mainly single-chip, the role of the microcontroller module is to send over the instructions to decode the command to clear the requirements of the task, and then guide the microcontroller chip pin in different time input and output different the high and low voltage, to control other chips to work.

Driving system in the control system is a module supporting the microcontroller, the microcontroller in the instruction after the analysis, according to the instructions after the resolution of a certain level of their own high or low, but the microcontroller's output current is not enough to support the system of the drive operation, so the drive system in the realization of the drive to provide a realization of the channel, and then achieve the completion of instruction action <sup>[2]</sup>.

## **2.the host computer control port design**

In the intelligent car control, taking into account the user groups, the embedded control system installed in the mobile phone to carry the mobile side, the phone interface can be achieved through software programming, in the interface to achieve the control of the system, it can have the direction of the control button and left to right of the drag bar, through the phone port of the operating system to achieve the movement of intelligent car control. Its system to increase the monitoring module, the smart car to install the appropriate camera, the two sides connected to the wireless network module, you can achieve the camera and the shooting of the image sent to the phone interface, the user through the phone display can see the car running real-time status, and through the mobile phone embedded in the system interface to the left and right scroll bar for car speed control <sup>[3]</sup>.

## **3. the wireless network data transmission module design**

### **3.1 Wireless network technology**

Wireless network as a wireless broadband, but also widely used in the community familiar WIFI network, the English name is Wireless Fidelity. WIFI network is a wireless network communications technology brand, held in 1999 WIFI Union held, initially known as WECA, in 2002 officially changed its name to WIFI Alliance. As a kind of Internet technology, for the user's life and work provides a great convenience, some places through the establishment of hot spots, but also can achieve access to the WIFI network, the creation of hot spots is based on Internet technology and installation of access points to connect through the access point will be short-range transmission to achieve the transmission of wireless signals to complete the communication process.

The wireless network connects the personal PC side and the mobile terminal of the mobile phone to the interconnection. The industry standard of IEEE defined wireless network communication is IEEE 802.11. So far the development of wireless network technology for nearly two decades of development time, business needs of the market

is still expanding, covering more and more widely [4].

### **3.2 Intelligent monitoring**

Intelligent monitoring mainly includes the user's Android's equipment, routers, information collection of three modules, the information collection through the microcontroller, web camera to achieve the basic image of the image collection, through the WIFI sent to the user's installation equipment. Intelligent monitoring system can achieve the most basic monitoring functions, the monitoring area of the monitoring images can be real-time collection and viewing. The user port can be deployed to the monitoring system and disarmed. In the video monitoring module users through the Internet for real-time camera position, view the monitoring of the image [5].

### **3.3 Intelligent monitoring in the realization of the control system**

The wireless data transfer module in the intelligent vehicle control system can be based on the TL-WR703N wireless router, with the addition of a USB interface and a TTL interface outside the router's basic power supply port and Ethernet interface. USB interface is mainly placed with the car on the camera to connect, TTL interface will be the next crew and wireless network module to connect. This setting can fully realize the connection between the Internet module, the monitoring module and the driving system. After the USB camera is connected to the USB interface of the wireless data transmission module, the power supply, the wireless data transmission module and the automatic loading camera are started. After the driver is loaded successfully, the camera's indicator light is on.

In the user to monitor the image acquisition can be achieved through software programming, the user uses the mobile phone mobile terminal for wireless function search after the connection to achieve the establishment of wireless modules, open the mobile phone page to enter the set of Web sites can be seen in the browser camera the transmitted video stream image [6].

## **4. based on WIFI network of car security aspects of innovation**

Traffic lights monitoring technology in the car application can be used for car anti-theft monitoring, when the car anti-theft system to start, car built-in camera in the door open moment, or knock (vibration sensor) window to stop the moment, take pictures or video, and through Wireless WIFI or Bluetooth technology to the owner of the phone, the owner can be prompted according to the phone can immediately alarm, and provide evidence for the police. Traffic monitoring technology is simply an intelligent electronic police, the system mainly by the intersection of front-end equipment, network transmission system and the central management system, the system is mainly used during the work of pure video detection, video streaming images of the moving objects can be real-time detection, locking, tracking, and then according to the vehicle's trajectory to determine whether the vehicle violation. The front-end equipment video acquisition of the intersection is mainly using the high-definition intelligent CCD intelligent camera as the main body of the image acquisition, and with the LED cold light for night fill light, through the control of control and management, and set up a network of optical transmission set, Implementation of the relevant information for network upload. Central management system can be achieved on the installation of the equipment for the remote management of the intersection, network monitoring, using a central management server and a number of client mode to connect the process of erection of the relevant proxy server to achieve the equipment network data processing and the establishment of the database record the operation data of the center server and the network information returned by the agent. According to the principle of traffic monitoring can be fully applied to the car anti-theft monitoring, when the car anti-theft system to start, car built-in camera in the door open moment, or knock (vibration sensor) window to stop the

moment, take pictures or video, WIFI or Bluetooth technology to the owner of the phone, the owner can be prompted according to the phone can immediately alarm, and to provide evidence for the police.

The realization of this process can take full advantage of the traffic monitoring of the three major system junctions front-end equipment, network transmission system and the central management system, the use of anti-theft security in the car should be converted into vehicle terminals, network transmission system and mobile phone mobile control system. Car terminal has a car video terminal, wireless video surveillance and GPS positioning system, can realize the real-time view of the vehicle inside the situation, increase security, accident evidence and other functions; network transmission system to support wireless Internet access and through the WIFI on the SD card video files to extract, you can achieve remote terminal control network real-time monitoring. Mobile phone mobile terminal control system can be achieved on the car monitoring video real-time view, remote control, multi-screen monitoring and manual video and other functions. When the car is stopped, the TTL interface connects the lower computer and the wireless network module to realize the connection between the wireless network module, the monitoring module and the induction drive system. After the user locks the door, the sensor set in the vehicle body receives the lock instruction start the work, the car system and mobile phone mobile terminal connected to the WIFI, the realization of video data and sensor control of the connection in the USB camera connected to the wireless data transfer module USB interface, to achieve power supply, wireless data transmission module and automatic load the camera, shake the sensor to start, drive the load is successful, the camera indicator light. Users in the wireless conditions set by the mobile phone in the mobile web page or software to monitor the real-time view. In the upper position mobile phone mobile port, in the operation page through the java language programming to achieve the car sensor connection, the induction system to single-chip control of the wireless module to send over the instructions to decode, to clear the task of the task requirements to guide the chip feet in different time input and output different high and low voltage, to control other chips to work, and then to achieve the monitoring and alarm prompts and other functions to achieve [8].

## 5. Conclusion

In summary, the intelligent vehicle control system and WIFI network technology to build, by setting the mobile phone port control interface and the corresponding wireless data transmission system to achieve the user through the mobile phone port interface to operate the car according to instruction to move and move accordingly. Through the wireless data transmission system through the wireless data transmission system to achieve the image through the wireless data transmission to the mobile phone port operation, to ensure that the smart car running in the phone port can be real-time control. In this paper, the application of single-chip microcomputer in the use of intelligent vehicle control system, to some extent for the future to achieve safe driving vehicle provides the relevant technical support.

## Reference

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