
基于 WIFI 视觉车的设计方案

摘要

本文主要介绍了一款基于 WIFI 视觉车的设计方案，此次设计主要可分为两部分，分别为：上位机和下位机。本次设计是一款基于 51 系列主控制器的智能小车，可以实现由手机端通过 WIFI 来控制智能小车前后左右移动等功能。在智能小车上安装了摄像头用来采集视频，所用摄像头为 USB 摄像头，使用起来比较简单，这样就可以实时采集视频，并将采集到的视频传输到手机控制端。另外，本设计所使用的单片机支持多种传感器的安装，如本文使用到的红外线传感器和超声波传感器，从而实现智能小车自动循迹和避障的功能。下位机在软件的设计部分中所选用的开发环境是 Keil5，对各功能进行了模块化编程。下位机是基于 Andriod 在 eclipse 开发环境下设计的，最终形成 APK 文件，最终在 Andriod 手机上进行移植，并进行测试，可以对小车进行控制，另外可以显示由下位机传来的视频。在设计中，视频的传输是采用 http 协议；控制命令数据等是通过 tcp 协议进行传输的。目前机器人在生活中被用于很多场景中，例如带有摄像头的机器人可以用于医院中查病房，所以此次设计的研究具有一定的现实意义。

关键词：WIFI；视觉车；循迹；避障；Andriod

Abstract

This paper mainly introduces the design of a vision car based on WiFi. This design can be divided into two parts: upper computer and lower computer. This design is a kind of intelligent car based on 51 series main controller, which can realize the functions of mobile phone terminal controlling the intelligent car to move forward and backward through WiFi. A camera is installed on the smart car to collect video. The camera used is USB camera, which is easy to use. In this way, the video can be collected in real time and transmitted to the mobile phone control terminal. In addition, a variety of sensors can be installed on the intelligent car. In this design, two sensors are installed, which are infrared sensor and ultrasonic sensor, so that the intelligent car can automatically track and avoid obstacles. The development environment of the lower computer in the design part of the software is keil5, which makes modular programming for each function. The lower computer is designed based on Android in the eclipse development environment, and finally forms the APK file. Finally, it is transplanted and tested on Android mobile phone, which can control the car and display the video from the lower computer. In the design, the video transmission adopts HTTP protocol; the control command data is transmitted through TCP protocol. At present, robots are used in many scenes in life, for example, robots with cameras can be used in hospital ward, so the research of this design has a certain practical significance.

Key words: WiFi; Vision car; Tracking; Obstacle avoidance; Android

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