基于树莓派的智能小车系统的硬件设计

摘　　要

　　近年来，智能化已经渐渐深入到了人们的生产和生活当中，它能够在不进行人为实时操控的情况下，在通过软硬件结合的方式，让目标操作系统在特定的环境中自动的运作，不需要人工的参与或者说大量减少劳动力的使用，其中智能化小车系统的地位尤为突出，它可应用于疫情探测、智能家居、工厂监测等领域，有着广阔的应用前景。

　　本次设计为基于树莓派的智能小车系统的硬件设计，采用树莓派 Raspberry pi3B 作为本次小车的核心控制板，采面向对象的 Python 语言进行编程，通过驱动芯片 MX1508 实现对小车左右两路直流电机的控制从而使智能小车实现前进、后退、左转、右转、停止等功能，并结合超声波传感器实现自动测算前方障碍物距离，借助烟雾传感器 MQ135 和 MCP3002 数模转换芯片实现烟雾传感器与树莓派交互的功能。

　　树莓派具有电脑的所有基本功能，属于微型电脑，用途广泛，本设计运用其运算和处理能力来实现小车的各种功能，最终实现简单的智能化。

关键词：树莓派；智能小车；MX1584；Python；避障

Design of Intelligent Car Control System Based on Raspberry Pi

Abstract

In recent years, intellectualization has gradually penetrated into people's production and life. Without artificial real-time control, it can make the target operating system operate automatically in a specific environment through the combination of hardware and software, without manual participation or a large reduction in the use of labor force. The status of intelligent car system is particularly prominent. It can be used in epidemic detection, smart home, factory monitoring and other fields, and has broad application prospects.

This design is based on the hardware design of the intelligent car system of raspberry pie. Raspberry 3B is used as the core control board of the car. The object-oriented Python language is used for programming. The driving chip MX1508 is used to realize the control of the left and right DC motors of the car so that the intelligent car can move forward and backward. The functions of left-turn, right-turn, stop and so on are combined with ultrasonic sensors to automatically measure the distance of obstacles ahead. The interaction between smoke sensors and raspberry pie is realized by means of smoke sensors MQ135 and MCP 3002 digital-to-analog conversion chips.

The raspberry pie has all the basic functions of the computer and belongs to the micro-computer. It has a wide range of uses. This design uses its operation and processing ability to realize various functions of the car, and ultimately realizes simple intellectualization.

Key Words：Raspberry Pi; Smart Car; L298N; Python; Obstacle Avoidance