

System construction and working principle information technology essay

[Technology](#), [Information Technology](#)



Abstract:

Home security and control is one of the radical demands of mankind from early days. But today it has to be renovated with the swiftly modifying technology to yield enormous indemnity and real time operation. This work evaluates the advancements of a Low-cost security system using small PIR (Pyroelectric Infrared) sensor built around microcontroller. Deploying wireless technologies for security and control in home automation systems offers fascinating assets along with user friendly interface. In this work, implementation of a modernistic security and control system for home automation is presented. The proposed system consists of a control console interfaced with different sensors using Zigbee. The remote home security system sighted in this work associate the utility of WSN and GSM. In essence, wherever the end users are, once some speculative precedent arise in home, such as gas leaking or thief intruding, this system can send alarm short message to the users through GSM network promptly. Besides, the wireless sensor network entrenched in home has the appearance of alleviate enactment, without use of cable, and low-power consumption. Keywords: Pyroelectric Infrared sensor, home automation system, Zigbee, wireless sensor network, short message service, global system for mobile communications, low power consumption

1. INTRODUCTION

Invulnerability is the ultimate concern of home for humankind. Beside the evolvement of IT expertise, network and automatic supervision technology, a remote home guarding and intimation system reformed more and more

practicable nowadays. By combinative of wireless sensor network(WSN) and GSM technology, this work outlines a low-power utilization remote home guarding staging and intimation system that can detect the theft, leaking of raw gas and fire, and send alarm message to the house possessor's mobile phone . Wireless sensor network is tranquillized of a prominent quantity of small-scale self organizing wireless sensor nodes. By combining three kinds of technology such as sensor and wireless communication, WSN can detect, collect and deal with the object information in its covering area, and send data to the observer. In a word, WSN technology has the advantages of wide covering area, able to remote monitoring, high monitoring precision, fast network establishment and reasonable cost. GSM network has the advantages of mature technology, wide covering area, long communication distance, and sound communication effect and so on. Intelligent home, also known as the smart residential home, is moving towards the wireless remote control, multi-media control, and high-speed data transmission. The key technology of intelligent home is compatible to household controllers and it can also meet the transmission requirements through home networking. At present, lots of integrated transport network is based on comprehensive wiring technology, limiting the system to special places, and higher cost. Currently, researches on the wireless intelligent home security surveillance system are becoming a hotspot due to its flexibility and convenience. At present, the application of intelligent home wireless communication technologies mainly include: infrared technology, Zigbee and GSM technology, and so on. IrDA is a short distance for the half-duplex point-to-point communication. Besides, it's inconvenient and of high error rate, which

make IrDA not applicable to the family network communication. Bluetooth technology is limited by network capacity and it costs much. So Bluetooth technology is not suitable for the home network with a large number of nodes. Zigbee technology has the moderate transmission range and larger network capacity. Here Zigbee technology is developed in the monitoring system.

2. RELATED WORK:

This chapter embracing the literature review of the project which includes the Concept, theory, perspective and the method of the project that is used in order to solve the problem occurs and any hypothesis that related with the research of methodology. Home surveillance has been an important research topic for a long time. In order to implement large-scale remote Monitoring, networking techniques are introduced. Traditional surveillance systems suffer from an unnecessary Waste of power and the shortcomings of memory conditions in the absence of invasion. In this design we use Pyroelectric Infrared sensors (PIR) and pressure sensors as the alert Group in windows and doors where an intruder must pass through. These low-power alert sensors wake up the MCU (Micro Controller Unit) which has power management for the Ultrasonic sensors and PIR sensors indoors. [1].

Therefore Wireless sensor networks can be an alternative in these Cases since WSNs are deployed without the need for any Pre-existing infrastructure and with little maintenance. The approach to Zigbee Based Wireless Network for Industrial Applications standardized Nowadays. In this paper, we have tried to increase these Standards by combining new design techniques to

wireless Industrial automation. The personal computer based wireless Network for industrial application using Zigbee can be adopted at micro and macro Industries; it has various types of Processors and Microcontrollers. Here Microcontrollers, Temperature Sensors, Zero crossing detectors, Voltage Regulators are used. The system is fully controlled by the Personal Computer through Visual Basics GUI (Graphical User Interface). The GUI is developed based on application by the user. All the processor and controllers are interconnected to personal computer through Zigbee. [2]. as we known, the reliability of wireless communication Is lower than wired communication. Faouzi Derbel researched the reliability of wireless communication for Fire detection systems in commercial and residential areas, and analyzed parameters that can influence the radio Transmission within buildings [3]. The requirements and challenges of Low Cost SMS Based Home Security Systems are analyzed in Ref. [4]. In order to Real-time monitor, controlling and securing a Digital Home using Multiple Sensor Based Perception system Integrated with Mobile and Voice technologies is proposed in Ref. [5].

3. SYSTEM CONSTRUCTION AND WORKING PRINCIPLE

The system structure is illustrated in figure 1. It is composed of both hardware and software. The hardware development is divided into three stages. The inputs stage of the security system is the PIR detector circuit, LPG gas sensor and Temperature sensor. The second stage is the controller unit which is the microcontroller PIC 16F877A. C:

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