

Self Configuration And Smart Binding Control On IOT Applications

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Abstract:

The rapid development of wireless communication technology facilitates the realization of the Internet of Things (IOT). Self-configuration and smart connection system have become relative important issue in accordance with wide applications of IOT and the energy saving concepts. This paper presents the integration of 'Auto-configuration and Wisdom Connection System' with Wireless Sensor Networks (WSN), IOT and ZigBee technology. Auto configuration based on a Received Signal Strength Indicator (RSSI), regional allocation, lighting auto configuration area and sub-areas. The proposed 'Auto-configuration and Wisdom Connection System' automatically configures different lightings to the same position within in the range -3dBm when the RSSI value varies only slightly. The system is configured to the same lighting site within the experimental environment when the sub-area range set -3dBm. This study presents a significant contribution to new configuration of objects in IOT, context awareness control, and optimization of network control platform.

Keywords: IOT, Auto-configuration, Smart binding, WSN, RSSI.

1. INTRODUCTION

The tremendous development in the wireless technology motivated to provide military detection applications. Since then, ZigBee technology has been extensively used in a large range of fields, providing communications and sensing with high reliability low power consumption, and multi-node networking. Presently this technology is extensively used in applications such as home electronic devices, process monitoring in industry, consumer products for health testing for monitoring or detecting intruders, medical sensing, elderly care, the collection of patients' information, such as blood pressure, heartbeat, and pulse, and environmental applications such as the detection of pollution water, soil and air using sensors. The popularity of smart devices has resulted in new applications of WSN, the new IOT and ZigBee technology. With respect to the consumer market, ZigBee-related technologies have been available for a long time but not yet universally. The costs, installation and operational complexity of such technologies will not provide the acceptance of consumers. controller is as simple as using a cell phone may provide new opportunities in the IOT. This concept proposes a 'Auto-Configuration and smart Connection System' that integrates WSN, the IOT and GPRS technology, and confirms its feasibility in both theory and practice. Lighting control systems with sensors are constructed with Auto-configuration and smart lighting control. The system configures lighting based on RSSI information of reference points, and provides information about lighting RSSI for controlling devices, facilitating reference alignment. This work proposes the concept of sub-area regional configuration, changing sub-area range by setting RSSI error, to increase controlling in lighting numbers and to enhance the effectiveness of automatic control .Configuration is an arrangement of elements or parts in a particular format based on our requirement. It is the automatic arrangement of

system without manual intervention and any software configuration programs. Binding is a act of providing the security and fastening the operation of the system. smart binding is that a user can able or disable operation on any individual port(port-based).once smart binding is enabled on a switch port, the switch will restrict or allow client access by checking the pre configured data. Smart connection system balances the connections and it chooses the best system for giving the best performance.

2. RELATED WORK

It will give the information of the unauthorized persons who are entering into the industry. The main source of PIR sensor is black body radiation. It is usually infrared radiation that is invisible to the human eye but can be detected by electronic devices designed for such a purpose. A Passive Infra Red sensor(PIR) is an electronic device that measures infrared (IR) light radiating from objects in its field of view.

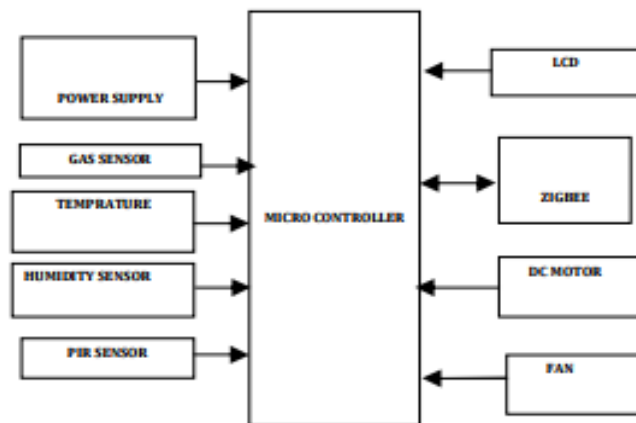


Fig.1.Block Diagram

PIR sensors are often used in the construction of PIR-based motion detectors. Apparent motion is detected when an infrared source with one temperature, such as a human, passes in front of an infrared source with another temperature. Modern automobiles are no longer mere mechanical devices; they are pervasively monitored through various sensor networks & using integrated circuits and microprocessor based design and control techniques while this transformation has driven major advancements in efficiency and safety. In the existing system the stress was given on the safety of the vehicle, modification in the physical structure of the vehicle but the proposed system introduces essential concept in the field of automobile industry. It is an interfacing of the advanced technologies like Embedded Systems and the Automobile world. This “Intelligent Sensor Network for Vehicle Maintenance System” is best suitable for vehicle security as well as for vehicle’s maintenance. Further it also supports advanced feature of GSM module interfacing. Through this concept in case of any emergency or accident the system will automatically sense and records the different parameters like LPG gas level, Engine Temperature, present speed and etc. so that at the time of investigation this parameters may play important role to find out the possible reasons of the accident. Further, in case of accident & in case of stealing of vehicle GSM module will send SMS to the Police, insurance company as well as to the family members. The original 10BASE5 Ethernet uses coaxial cable as a shared medium, while the newer Ethernet variants use twisted pair and fiber optic links in conjunction with hubs or switches. Ethernet data transfer rates have been increased from the original 2.94 megabits per second (Mbit/s) to the latest 100 gigabits per second (Gbit/s), with 400 Gbit/s. Systems communicating

over Ethernet divide a stream of data into shorter pieces called frames. Each frame contains source and destination addresses and error-checking data so that damaged data can be detected and re-transmitted. As per the OSI model, Ethernet provides services up to and including the data link layer.

3. PROPOSED SYSTEM

GPRS is a data transfer technology. In this user data (such as sensed values) is transferred in the form of packets. It uses packet radio principle to transfer user data packets in an efficient way. It is done between GSM mobile stations and external packet data networks. Packet-based data bearer service for wireless communication services that is delivered as a network overlay for GSM, CDMA and TDMA (ANSI-136) networks.

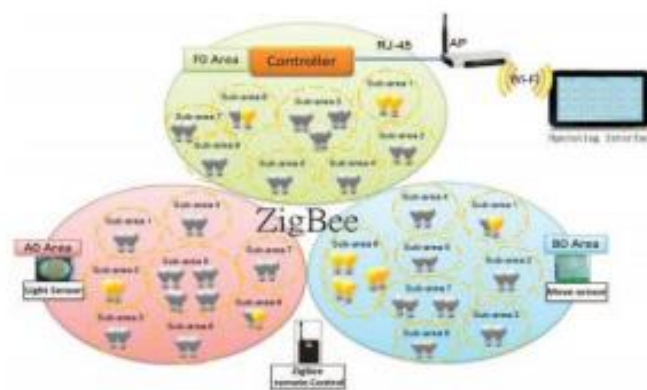


Fig.2.Architecture

Packet switching is where data is split into packets that are transmitted separately and then reassembled at the receiving end. GPRS supports the world's leading packet-based Internet communication protocols, Internet protocol (IP) and X.25, a protocol that is used mainly in Europe. GPRS enables any existing IP or X.25 application to operate over a GSM cellular connection. Cellular networks with GPRS capabilities are wireless extensions of the Internet and X.25 networks. The initial rapid development of wireless communications technology was motivated by the need for military detection applications. Since then, ZigBee technology has been extensively used in a large range of fields, providing communications and sensing with the low power consumption, high reliability, and multi-node networking. Today, this technology is extensively used in such applications as process monitoring in industry, consumer products for health testing, home electronic devices for monitoring or detecting intruders, medical sensing, elderly care, the collection of patients' information, such as blood pressure, heartbeat, and pulse, and environmental applications such as the detection of pollution water, air and soil using sensors. The popularity of smart devices has resulted in new applications of WSN, the new IoT and ZigBee technology.

4. ANALYSIS

Lighting control systems with sensors are constructed with Self-configuration and smart lighting control. The system configures lighting based on RSSI information of reference points, and provides information about lighting RSSI for controlling devices, facilitating reference alignment. Moreover, this work proposes the concept of sub-area regional configuration, changing sub-area range by setting RSSI error, to increase controlling in lighting numbers and to enhance the presents proposed scheme.

lamp can be allocated to each sub-area. When RSSI error range is applied to the site allocation process, the system compares the error range to RSSI value of the sited lighting, and assigns same lighting number. If error range is within a single sub-area; therefore, number of lighting devices in each sub-area is unlimited, and this scenario is called range site.

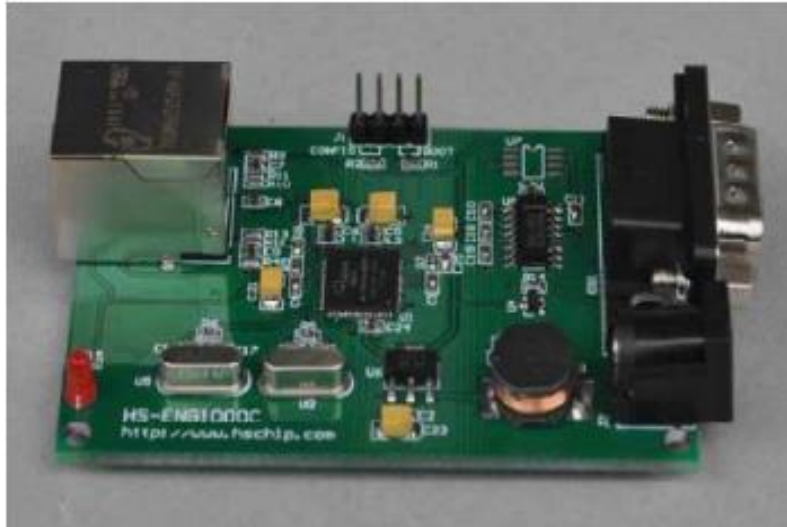


Fig.3.GPRS Module

The system can support 100 areas, each comprising eight sub-areas. The proposed system includes three areas, each of which consists of eight sub-areas. In wireless location, two main types of methods are used to convert signals into distances. The first, in which the arrival time of the signal is converted, includes time of arrival measurement method Time of Arrival (TOA) and the time difference of arrival method Time Difference of Arrival (TDOA) [8]. The second, in which distance is calculated from the strength of the received signal, includes the use of RSSI. RSSI is a simpler and easier method than TOA or TDOA for measuring distance, as it requires neither nanosecond-resolution equipment nor samples of long-term measurements, but it suffers from small errors associated with multipath interference and fact that strength of received signal diminishes as distance increases. The main aim of the system is to monitor and verify the system functions which are happening in the testing environment (say industry). The system hardware includes light sensors, mobile sensors, analog or digital remote controller, arm7, GPRS, Ethernet. These all combinely giving the required output. The system is designed to perform all the functions in various environments. This section verifies the effectiveness of the system function in a real environment.

CONCLUSION

The 'Auto configuration and Smart Connection System' is developed and its feasibility is verified. The results of verification of its major functions includes auto-configuration, indicate that the system provides auto-configuration for multi-lighting, with an RSSI value variation within -3dBm, and regional configuration in each sub-area validated. Regard to smart families costs, system installation and operational complexity affect consumer acceptance. The seamless binding of wireless technologies to all types of home appliances, elimination of the cumbersome setting, and causing users to feel that using a remote control is as simple as using a cell phone may provide new opportunities related to the IOT.

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