GSM BASED HOME AUTOMATION SYSTEM

SYNOPSIS

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INTRODUCTION

In recent years everything is becoming portable and compact which has led to budding interest among patrons in smart home concept. Its presence can be felt in the centralized lighting control, heating ventilation and air conditioning appliances, security systems, fire alarm system etc. to provide better ease, energy efficiency, security and convenience.

Home automation is building automation for a home, called a smart home or smart house. It involves the control and automation of lighting, heating , ventilation, air conditioning , and security, as well as home appliances such as washer/dryers, ovens or refrigerators/freezers. Wi-Fi is often used for remote monitoring and control. Home devices, when remotely monitored and controlled via the Internet, are an important constituent of the Internet of Things.

The main objective of home automation and security is to help handicapped and old aged people who enable them to control these appliances. The system proposed provides to control the home appliances using GSM networks, Android APK and Arduino board. The preface of the Global System for Mobile Communication (GSM) and mainly the use of cellular phones got the novelty of distance communication at remote location. Take a look at this example, a person on a drive within his car all of a sudden memorizes that he left the Cooler, ON actually it should be OFF. The usual circumstance is to drive back and switch OFF. But with the android mobile phone in the hand equipped with GHAS (GSM Home Automation System) Application, one looks on how the same could be used to result control at any point, anywhere and time without worrying geographical locations.

Review of Existing Relevant Literature

Home automation system is used to control the home appliances remotely. There are many home automation technologies available in market out of which the popular technologies are X10, Z-Wave, Zig-bee, GSM technology, INSTEON, and En-Ocean. All these technologies have its pros and cons. The proposed system is user friendly and easy to use. The system is using Global System for Mobile Communication (GSM) modem to control home appliances via Short Message Service (SMS). The AT-Commands has been used in this system to control the devices. AT89s52 microcontroller is integrated with the GSM to give baud rate of 9600 bps. For the security purpose the pattern is used that will authenticate the SMS.

EXISTING SYSTEMS

A. Zig-bee Zig-Bee is an IEEE 802.15 standard used in home automation technology and similar to wifi and Bluetooth technology. This technology uses radio frequency (RF) for signaling and control. Zig-bee is a mesh protocol, where devices can act as repeaters. This technology gives advantage of increase in the connectivity of devices within the home. Zig-bee technology is wireless so it helps to overcome the intrusive installation problem. The Zig-bee standard provides 250kbps data rate which is sufficient for controlling home devices.

B. INSTEON

INSTEON is used to integrate power line system with wireless system, was developed to replace X10 standard. It is partially compatible with X10 devices. The transmission of data occurs at 1131.65 KHz for power line devices and 904 MHz for wireless devices. It is easy to install and setup. INSTEON messages get through in less than 0.05 seconds so it activates an INSTEON-enabled switch and the lights turn on instantaneously.

C. EnOcean

EnOcean is one of the newest technologies in home automation. It is wireless sensor network technologies. It is more energy efficient than other wireless technology. Its main aim is zero energy consumption through energy harvesting. The maintenance is minimal because the devices are self-powered. Radio interference is also minimal because it operates in 315 MHz band. Their sensors have been installed over in over 25,000 buildings.

OBJECTIVE

The motivation is to facilitate the user to automate their homes having ubiquitous access. The System provide availability due to development of a low cost system. The home appliances control system with an affordable cost was thought to be built that should be mobile providing remote access to the appliances and allowing home security.

METHODOLOGY

A low cost and efficient smart home system is presented in our design. This system has two main modules: the hardware interface module and the software communication module. At the heart of this system is the Arduino microcontroller which is also capable of functioning as a micro web server and the interface for all the hardware modules. All communication and controls in this system pass through the microcontroller. The smart home system offers feature such as environmental monitoring using the GSM Modem. It also offers switching functionalities to control lighting, fans/air conditioners, and other home appliances connected to the relay system. All these can be controlled from the Android smart phone app or web application.

Project Time Line

Information gathering and analysis.- 15 Days
Preparation of Questionnaires. – 15 Days
Data collection – 2.5 months
Data analysis and final report preparation – 1.5 months

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