Intelligent Home Automation Control System Based on wireless sensor network

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ABSTRACT

Home/office automation is currently a new growing field in Science: The goal of this automation is controlling the house elements lights, fans, air conditioner in order to save energy and raise the quality of living. In this project in order to make life easier some smart home applications are designed. In this project Home/office automation is done using wireless technologies. System is developed with device controlling temperature monitoring, and light controlling. Temperature monitoring and light controlling is developed using GSM.

I. INTRODUCTION

HOME automation constitute a branch of ubiquitous computing that involves incorporating smartness into dwellings for comfort, healthcare, safety, security, and energy conservation. Remote monitoring systems are common components of smart homes, which use telecommunication and web technologies to provide remote home control. Home automation offers a better quality of life by introducing automated appliance control and assistive services. A user can control home appliances and devices remotely, which enables him or her to execute tasks before arriving home. Homes automation enhances traditional security and safety mechanisms by using intelligent monitoring and access control. The aim of the smart home application is to discover a valuable wireless system that will provide controlling of the home equipments remotely whenever the home host is absence of home, the host remotely manipulates the home equipments by the smart home application which is the main aim of this system. As the advance of technology, the user has to take the advantage of technology in such a way that a person can send a message to home control center when he forgot to turn off air conditioner instead of returning home. In addition it also provides the home security. This application proposes a system that allows user to control home equipments any where any time.

II. EXISTING SMART HOME APPLICATIONS

A smart home system mainly includes heating, ventilation, and air conditioning, Lighting control, or Audio and Video distribution to multiple sources around the

house, security (involving presence simulations, alarm triggering and medical alerts).

Smart homes systems are grouped by their main functions such as

- Alert and sensors – heat/smoke sensors, temperature sensors
- Monitoring – Regular feed of sensor data i.e. heat, CCTV monitoring
- Control – switching on/off appliances i.e. sprinklers, lightings
- Intelligence and Logic – Movement tracking i.e security appliances

The different technologies that could provide for smart home communication are X10, Insteon, Zigbee and Z-Wave. X10, developed in 1975 by Pico Electronics of Glenrothes, Scotland, allows compatible products to talk to each other remotely over the already existing electrical wires of a home. The first "home computer" was an experimental system in 1966. The Smart House Project was initiated in the early 1980"s as a project of the National Research Centre of the National Association of Home Builders (NAHB) with the cooperation of a collection of major industrial partners [2]. By using

wireless technology, today one can easily control home " s mechanical systems and appliances
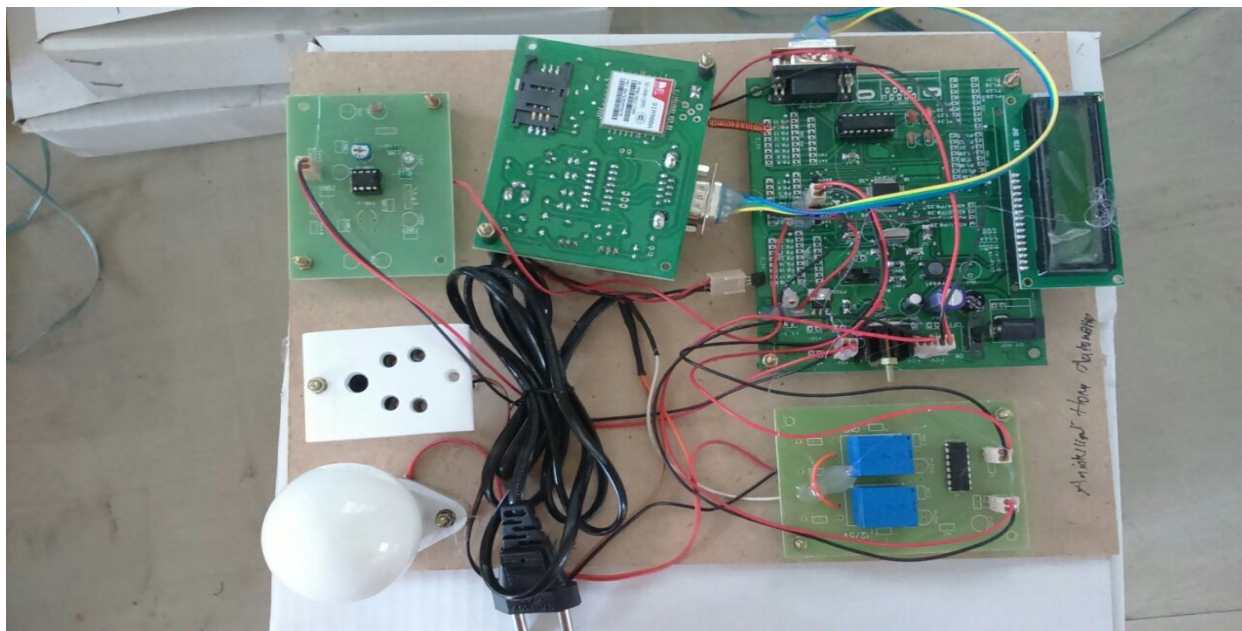
III. PROPOSED SMART HOME AUTOMATION SYSTEM

Over cellular phone or Internet. As the GSM technology provides ubiquitous access to the system for security and can automat appliance control, it is very popular technology now a days.

Home Security with Messaging System [3], Security & Control System, and Remote and Security Control via SMS [4] were the three alarm system that were designed using SMS application to securely monitor the home condition when the owner are away or at night. The system described in [5], is also based on GSM technology. The system is wireless and it provides security against intrusion as well as automates various home appliances using SMS. The system uses GSM technology thus providing ubiquitous access to the system for security and automated appliance control.

CIRCUITDIAGRAM:

LPC2148:

The LPC2141/2/4/6/8 microcontrollers are based on a 32/16 bit ARM7TDMI-S CPU with real-time emulation and embedded trace support, that combines the microcontroller with embedded high speed flash memory ranging from 32 kB to 512 kB. A 128-bit wide memory interface and a unique accelerator architecture enable 32-bit code execution at the maximum clock rate. For critical code size applications, the alternative 16-bit Thumb mode reduces code by more than 30% with minimal performance penalty. Due to their tiny size and low power consumption, LPC2141/2/4/6/8 are ideal for applications where miniaturization is a key requirement, such as access control and point-of-sale. A blend of serial communications interfaces ranging from a USB 2.0 Full Speed device, multiple UARTS, SPI, SSP to I2Cs and on-chip SRAM of 8 kB upto 40 kB, make these

devices very well suited for communication gateways and protocol converters, soft modems, voice recognition and low end imaging, providing both large buffer size and high processing power. Various 32-bit timers, single or dual 10-bit ADC(s), 10-bit DAC, PWM channels and 45 fast GPIO lines with up to nine edge or level sensitive external interrupt pins make these microcontrollers particularly suitable for industrial control and medical systems.

GSM Mode

In this mode we develop light controlling system using opt coupler, gas detection temperature monitoring with sensor LM35 and door opening and closing from outside the home/office. We use GSM modem SIM300 for communication between user and devices..

Light controlling using Opt coupler

In this project light is controlled by using opt coupler in GSM mode. Two opt couplers are used placed near door. Opt coupler are connected to microcontroller. This system

counts no. of persons entering the room. We set counter in up/down mode. Counter increments if person entering the room and decrements when person leaving the room. Two devices connected at the output of the system fan and light bulb. We use two relays to connect devices. If count is increased by 1, means one person is in the room, system turn on the fan. If count increases more than 3 then second relay is operated and light bulb turned ON. O You can connect more devices to system to control light in the room. Figure 5.5 shows snapshot of light controlling system. First part shows no. of visitors displayed on LCD, visitor=1, Fan is ON. Second part shows count is 5, LCD displays visitor=5, Light turned ON.

B. Temperature Sensor

The temperature and heart beat sensors can measure temperature, pulse signals which are sent to the microcontroller. The sensors are connected to the I/O port of the microcontroller LPC1114. It is electronic device which provides a voltage analogue of the temperature of the surface on which it is mounted. The LM35 series are precision integrated-circuit Temperature Sensors whose output voltage is linearly proportional to the Celsius temperature. The sensor circuitry is sealed and not subject to oxidation. The LM35 generates a higher output voltage than thermocouples and may not require that the output voltage be amplified. The output voltage is converted to temperature by a simple conversion factor. Normally the body temperature for a normal adult is about 35 degree Celsius.

The general equation used to convert output voltage to temperature is:

- Temperature (oC) = Vout * (100 oC/V)
- So if Vout is 1V, then, Temperature = 100 oC.
- The output voltage varies linearly with temperature.
- Fig.3 shows the LM35 temperature sensor

CONCLUSION:

The main purpose of this paper is to control the home appliance remotely from anywhere. The host controls the home from anywhere through his mobile. Hosts sends an SMS through is mobile phone to the host control system at the particular device. The host control according to the condition given by the host control that particular device. The important aim of this project is to control the appliances when host is absence of the home. Thus the title is the design of remote intelligent smart home system

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