

## Smart and Secure Home using IoT.

Shreyash Churi<sup>1</sup>, Ankur Dang<sup>2</sup>, Aishwarya Pawar<sup>3</sup>, Dynaneshwar Kapse<sup>4</sup>

<sup>1</sup> Student VIII SEM, B.E., Computer Engg. , RGIT, Mumbai, India

<sup>2</sup> Student VIII SEM, B.E., Computer Engg. , RGIT, Mumbai, India

<sup>3</sup> Student VIII SEM, B.E., Computer Engg. , RGIT, Mumbai, India

<sup>4</sup> Professor, Department of Computers, RGIT, Mumbai, India

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**Abstract** - Rapid increase in the number of users of internet over the past decade has made Internet a part and parcel of life, and IoT is the latest and emerging internet technology. Internet of things is a growing network of everyday object from industrial machine to consumer goods that can share information and complete tasks while you are busy with other activities. Smart and secure home using IoT is a system that uses mobile devices to control basic home functions and features automatically through internet from anywhere around the world. It is meant to save the electric power, human energy, and user friendly and a safe system to control home appliances especially aimed to aid the elders. The project consists of an Arduino Mega board which along with a GSM modem is used to control various electronic devices as well as a fire emergency system which would help to reduce fire hazards. It also has a security feature to safeguard our smart home to detect intruder in our smart home.

**Key Words:** Smart and Secure Home, Internet of Things (IoT), Arduino microcontroller, GSM modem, Fire emergency system

### 1. INTRODUCTION

As we enter the 21<sup>st</sup> century, the interaction between humans and computer is breaking the old barriers and entering a new realm. In the highly technology driven world of today's computer and cell phones have become a part of our lifestyles. Computers are no longer tool to manage data and neither cell phone is just communication tool. Now a days Home automation has become important issue .Many types of solutions were developed and implemented .The wireless communication in mobile network has proved to be the best solution among all and has become a fast growing business. With the recent development in the mobile computing devices and the mobile networks new and better solution can be developed to make home automation more convenient and accessible for 24x7 from anywhere and anytime. Our project tries to derive a solution providing a better control on home appliance with the help of cell phone (Android) from anywhere in the world where you can find internet. Also the system comprehends the implications of IT on Administration and functioning of the Home appliances. Along with controlling the electronic devices remotely the fire and emergency system is deployed to save our smart home from various fire hazards. Lastly the use of motion sensor helps us to keep check on theft thus securing our

smart home. Smart home management has always seemed like a futuristic paradise but now it's real.

### 2. LITERATURE REVIEW

[1] Vinay sagar K N & Kusuma S M

This paper proposes a Home Automation using Internet of Things that employs Home Automation system (HAS) using Intel Galileo that employs the integration of cloud networking, wireless communication, to provide the user with remote control of various lights, fans, and appliances within their home and storing the data in the cloud. The system will automatically change on the basis of sensors' data. This system is designed to be low cost and expandable allowing a variety of devices to be controlled. The main hardware used in this project is the Intel Galileo Microprocessor which provides an interface for connecting various appliances as well as controlling them remotely with the help of relays and sensors.

[2] Mahesh N. Jivani

This paper describes GSM (Global System Messaging) based secured device control system using App Inventor for Android mobile phones. AppInventor is a latest visual programming platform for developing mobile applications for Android-based smart phones. The Android Mobile Phone Platform becomes more and more popular among software developers, because of its powerful capabilities and open architecture. It is a fantastic platform for the real world interface control, as it offers an ample of resources and already incorporates a lot of sensors. No need to write programming codes to develop apps in the App Inventor, instead it provides visual design interface as the way the apps looks and use blocks of interlocking components to control the app's behaviour. The App Inventor aims to make programming enjoyable and accessible to novices.

[3] Jayashri Bangali and Arvind Shaligram Kaveri

In this paper the security system is SMS based and uses GSM technology to send the SMS to the owner. The proposed system is aimed at the security of Home against Intruders and Fire. In any of the above cases happens while the owners are out of their home then the device sends SMS to the emergency number which is provided to the system. The system is made up of three components: sensors, GSM-GPS Module (sim548c), Atmega644p microcontroller, relays to control the device and buzzers to give security alert signal in terms of sound.

### 3. SYSTEM ANALYSIS

#### A. Problem Definition

Many people are always on the move from place to place due to business demands. Some people can spend a couple of days away from their home leaving all their household appliances without any kind of monitoring and control. Some devices are left plugged into power sockets whereas others are supposed to be plugged into and out of power sockets at different intervals depending on the time of the day. All this requires an individual to manually attend to each of the devices independently from time to time. All such monitoring and control can be done without necessarily being around or inside the home. Some devices if not controlled properly consume a lot of energy which leads to extra expenditure on electricity. Also there can arise emergency events which need to be controlled while we are not actually present in our home Therefore we propose to design an internet based home automation system which will enable one to remotely manage his/her appliances from anywhere, anytime and also safeguard his smart home against fire accidents or theft.

#### B. Proposed System

The proposed system consist of different sensors like temperature sensor, PIR sensor. When the connection is established it will start reading the parameters of sensors like connected. The threshold levels for the required sensors are set as per our need. The data can be analyzed anywhere any time. If the sensor parameters are greater than the threshold level then the respective alarm will be raised and the required actuation is done for the controlling of the parameters. In the proposed model the temperature, motion in the house is monitored. The temperature and the motion detection is stored in server for analysis. If the temperature exceeds the threshold level then the GSM shield sends notification to the owner of the house about it or if any motion is detected when there is no one at home then also a SMS is sent to the owner. The user can also monitor the electric appliances through the internet via web server. If any electrical appliances are left on in hurry can be seen and turned off remotely through simply typing the IP address of the web server.

#### Home Automation System Functions:

The proposed home automation system has the capabilities to control the following components in users home and monitor the following alarms:

- Temperature and humidity
- Motion detection

The proposed home automation system can control the following appliance:

- AC on/off
- Washing machine on/off

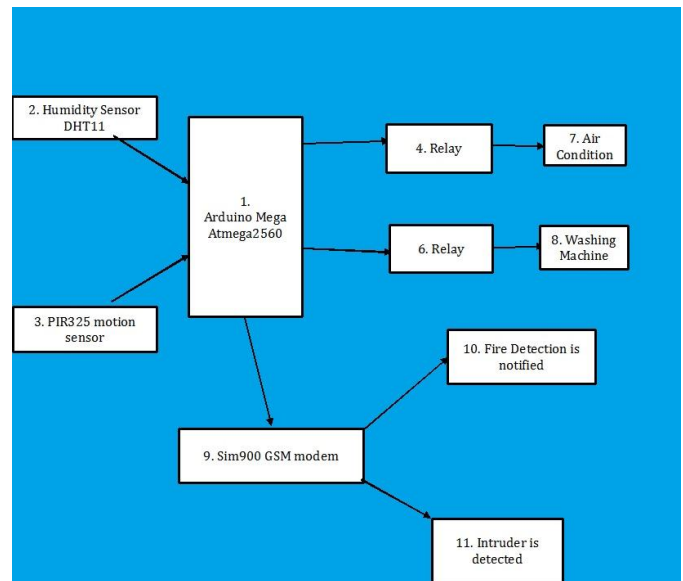


Fig -1: block diagram of smart and secure home

2 → 1 → 9 → 10 For detecting Fire

3 → 1 → 9 → 11 For detecting intruder

1 → 4 → 7 For Controlling AC

1 → 6 → 8 For Controlling Washing Machine

The Arduino Mega is programmed to control two devices (AC and Washing Machine) by switching them on/off remotely. For this purpose relay circuit is used which halts the power supply and gives the leisure to access his appliances with his/her fingertips.

The temperature sensor is used for fire emergency system which is connected to GSM modem through Arduino to send SMS if fire is detected to the users mobile phone.

The major part of the project is security system to safeguard the smart home built using a PIR motion sensor which will send intrusion detection signals to user when any obstacle is detected by the IR sensor and check about any outsider or thief.

### 4. CONCLUSIONS

These Smart and Secure Home systems using IoT can be a future bright thing in the field of technology and it will minimize human efforts. It will thus bring a new era of technology as it will get implemented in each and every household and will prove beneficial in saving electrical energy and also help in tackling various household hazards efficiently.

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