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## Security Sensor for Protection in Smart Home Using IOT

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### ABSTRACT

*In the IOT, things are expected to become active participants where they are able to interact and communicate among themselves by exchanging data and information sensed about the environment. For that, they react autonomously to the real world events and provide services with or without direct human intervention. Home automation is nothing but automation of regular activities inside in the home*

*Now a day's due to huge advancement in wireless sensor network and other computation technologies, it is possible to provide flexible and low-cost home automation system. However, there is no any system in the market which provides home automation as well as error detection in the device efficiently.*

*The project Proposes an efficient implementation for IoT used for monitoring and controlling the home appliances via Android App. Home automation system uses the portable devices as a user interface. They can communicate with home automation network through an Internet gate, by means of low-power communication protocols like ZigBee, Wi-Fi etc.*

*This project aims at Monitoring home appliances via Smartphone using Wi-Fi as the communication protocol and Arduino Uno. The user here will move directly with the system through a web-based interface over the web whereas home appliances like lights, fan etc. are remotely controlled through the easy website.*

**Keywords:** Zig-Bee, Wifi, Smart Home.

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### 1 .INTRODUCTION

#### [1.1] MOTIVATION

The vision of smart home is an old idea. We are going to create a simple home to control our home devices through the internet. Some following biggest inspiration of smart home are: 1) Improve standard of living, 2) Change home environmental condition according to the mood of habitats, 3) To develop a system which requires less human interaction for handicapped, 4) Need energy efficient, flexible system which also detect the fault in devices automatically and notify related technician and user about the problem automatically through cloud.

#### [1.2] INTRODUCTION

- Today, technology has become a new part of people's lives. It influences many aspects of daily life and has provided improved social interaction, ease of transportation, the facility, and flexibility to spoil in entertainment and media and thus become useful in the enlargement in medicine world. The development of different tools like mobile phones and computers help the human being to

communicate with their friends and relatives to store information like images, movies, documents, and music.

- The Internet has transformed people's lifestyle to provide anytime, everyone connectivity with everywhere. The Internet helps us to bring in with an immediate solution for many problems and also able to connect from any of the remote places which contribute to overall cost reduction and energy consumption.

Daily the new age population expect novel system and modified technology for simplifying everyone life. The industry and researchers will at all times try to create different things and techniques. Still, it is not easy to satisfy the people. During the 1990s, Internet connectivity had spread in business and consumer market; however, it was quite less in use due to small network interconnections. During 2000s internet connectivity was a standard way for many applications and today it is probably part of many enterprise, manufacturing and consumer markets to give access to information and data. These devices are still based on the internet which requires more coordination and monitoring through apps and interfaces.

- Since many years, Home automation is mainly used as features of science Fiction but became practical in early of the 20th century that is because of the introduction of electricity and quick improvement in information technology.

#### [1.2.1] SMART HOME

- Home automation or smart home is described as a technology which is used within the environment of home for providing comfort, security, convenience, and energy efficiency for its users. The internet of things and the research and development of home automation will become very famous.
  - Different wireless technologies that provide transfer of data control and sensing RFID, Wi-Fi, BT and also cellular network have been found to add intelligence at various hierarchies in the home.
- [1]FIGURE 1 SMART HOME
- Every existing, well-established smart home based on wired communication. If the system is planned in advance, it would not create any problem and implement by substantial construction.
  - At the other side, the wireless system will provide information and do mapping of the automation system. With the innovation in wireless technologies like Wi-Fi, cloud networks in the past, wireless systems will be used daily and all over. [10]



**FIGURE 1 Smart Home**

#### [1.2.2] INTERNET OF THINGS (IOT)

1. **Internet of things:** "By the use of internet one can connect to the computer Systems will connect to the real world objects or things. Things may include any objects, home appliances, devices, vehicles, etc. and when these things connect to the internet in specific infrastructure via standard protocols then the whole system is said to be the internet of things." [19]

2. The Internet of Things (IoT) can be defined as the Internet of Objects; it will change everything including ourselves [13].
3. The Internet of Things (IoT) can be mentioned to link every object such as mobile phones, Internet Television, sensors and actuators of Internet where the devices are brightly connected with each other for generating an innovative area of communication among objects and people as well as between objects themselves [11].
4. The internet of things is not just a dream for future but it is already here and is living and crash more than just technological development. With the use of the internet, one can arrange themselves independently and can be operated without human effort. [19]



Figure 2 Objectives Of IOT.

### [1.3] RESEARCH CHALLENGES

1. Ethical question about privacy and data protection on smart home devices
2. Cost of implementation
3. Authentication: Authentication should be secure from a hacker. The server has to give access for authentic users.
4. Security: The system is able to take appropriate actions against security harm and the system must be reconfigured by itself after attacks.
5. Integration: The main challenge with IOT is to combine applications in IOT environment.
6. Coordination: Coordination is necessary between the universally connected things, people, programs, process.
7. Data Storage: With the increase of IoT applications, the amount of collected data is high. The key challenge is to storage of the huge data. The Large database can solve this problem. Artificial intelligence algorithms must be applied to extract meaning data from redundant data.
8. Network Self-Organization: Network structure must be created with design and mapping so, devices can be connected to it and the system should self-organize itself.

### [1.4] THESIS OBJECTIVES

1. We sense environmental circumstances by a variety of sensors and according to its values, we manage various devices which are connected to the microcontroller through drivers and relay board.
2. One PC is connected to microcontroller will monitor the sensors values continuously,
3. We can manage to modify settings by just varying the threshold values in the Pc.
4. If some device is not functioning after some time period sensors will detect the faulty device.
5. Cloud server find out nearby technician and service provider

## CHAPTER-2 BACKGROUND & HISTORY

### [2.1] DEFINITION

1. An ordinary definition of Smart Home is an “electronic networking expertise to join together devices and appliances so that the whole home can be monitored and forbidden centrally as a single machine” (Pragnell

et al., 2000). Another term that describes the same technology is “domestics”, which derives from the Latin word domus, meaning house, and informatics, meaning the learning of the processes concerned in the collection, categorization, and sharing of data. However, since this technology is still very much in change, other terms are also used in the literature with equivalent meaning, such as: ““home automation”, “smart house”, “digital home” or “electronic home””.

## **[2.2] HISTORY**

1997,” The Internet of Things "is the 7th in the series of ITU internet Reports at first launched in 1997 under the title “Challenges to the network”. [4] 1999, Auto-ID center founded in MIT 2005, Four important technologies of the internet of things was proposed in WSIS conference.[8] The term Internet of Things was first used by Kevin Ashton in 1999.2008: a first international conference of IOT. The IoT 2008 was held in Zurich.

## **[2.3] BACKGROUND (IOT)**

### **[2.3.1] WHY INTERNET OF THINGS?**

1. Dynamic manager of manufacturing and daily existence
2. Improve the supply exploitation ratio
3. Improved connection between people and environment.
4. Formatting a scholar thing by integrating human society and physical systems
5. Easy mapping of the system
6. Universal transport & internet working
7. Ubiquitous access

## **CHAPTER-3 OVERVIEW OF SMART HOME**

### **[3.1] INTRODUCTION TO SYSTEM**

1. Home automation will do automation of expected activities inside the home. Recently enormous development in wireless sensor network and other computation technologies; it is likely to provide flexible and less cost home automation system. There is no any system in the market which provides home automation as well as error detection in the device.
2. Every person who is knowledgeable in the existing system may think of a system that may add more flexibility and run with some ordinary applications such as android. This work is designed in such a way to avoid the disadvantages of the presented system. The future system supports more elasticity, comfort capacity, and safety.
3. The main objective is to design and to carry out a cost-effective home automation system that's able of leading most of the home and sustain the house automation system. The predictable system contains a great flexibility by using wireless reliable technology to interconnecting various modules to the server of home automation system. This, in turn, reduces the deployment cost; will add to the flexibility of advancement, and system reconfiguration. [18].
4. In this thesis, we will create a system to provide fully smart environment monitoring system with the use of a variety of sensors for providing required information for automatic detection and resolution of the problem in the appliances.

### **[3.2] BUILDING BLOCKS OF SYSTEM**

There are main three building blocks of this system:

1. Data acquisition
2. Web server
3. Local Hardware

## **CHAPTER-4 HARDWARE & SOFTWARE**

### **[4.1] HARDWARE**

- ESP 8266 WiFi Module
- Arduino uno Board

#### **[4.1.1] SENSORS**

- PIR Sensors
- MQ2 Gas Sensors
- Temperature Sensors
- LDR Sensor

## **CHAPTER-5 ADVANTAGES & APPLICATIONS**

### **[5.1] ADVANTAGES**

1. Currently, wireless systems like Wi-Fi become progressively common in home networking. The use of wireless technologies provides several advantages that would not be full filled using a wired network only.
2. **Abridged implementation costs:** First and leading, installation costs considerably reduced because no wiring is necessary. Wired solutions require cabling, where a substance, as well as the specialized laying of cables, is luxurious.
3. **System scalability and easy extension:** Deploying a wireless network is a very good option because new or changed requirements, an extension of the network is necessary. Wired installations, in which cabling extension is tedious. This makes wireless installations a low-cost investment.
4. **Aesthetical benefits:** This quality helps to complete aesthetical necessities as well. Examples include representative buildings with all-glass architecture and chronological buildings where design or hothouse reasons would not allow the laying of cables.

### **[5.2] APPLICATION**

Smart homes have benefits of different techniques like automation of technology and modern building to provide house owners a new level of control. It is possible that Smart homes built from scrap with the use of automation as a key design goal, or constructed from obtainable homes during a major renovation.

There are many categories for smart home uses

- Home Automation:
  - Adaptive lighting
  - Facilities automation
  - Environment monitoring
  - Adaptive energy use
  - Garden & plant management
- Home Security
  - Intrusion alarm
  - Home monitoring
  - Fire alarm & gas detection
  - Video surveillance
  - Entry authorization
- Family Care
  - Child/elder Monitoring
  - Conferencing
  - Health data monitoring
  - Education

## **CHAPTER-6 CONCLUSION**

### **[6.1] CONCLUSION**

- A Smart Home system combines electrical devices in a home with each other. The techniques for using in home automation include in building automation, the control of domestic activates, like TV, fan, electric tubes, refrigerator and washing machine.
- As per the literature review and other exciting work, I will design a new technique that will give me better understanding about home requirement
- This system is not only just monitoring but it will be used and act as per requirement.
- This system will provide notification to the user about any error occurs in the devices.
- In this, I am planning to reduce most of the human interface by providing the intelligent system.

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