

## Secure System for Senior Citizen At Home

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**Abstract:** Senior Citizens are those who have crossed their Majority of Life span. Senior citizens indicates that they are senior in most of the aspects in their life. The younger grows by gaining experience from them hence its their responsibility to take care of senior citizens. If they are alone at home there must be some system which could monitor the internal threats such as Fire detection , Intrusion detection , Gas Leakage. The Existing Smart Home System only monitors health related issues but not other internal threats. The health is being monitored by the system and alarming is been generated in an hazardous condition.

In our system, many internal threats like Smoke, Fire, Intrusion detection and Gas Leakage are being handled by the smart system for senior citizen at home. The smart system takes care by alarming and notifying intended users. We are using Arduino Uno Board along with “Atmega328p” microprocessor and for sensing the Environment, sensors such as PIR, MQ2 and LM35 are used.

**Keywords:** Senior Citizen, Smart Home, Internal Threats, App.

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### I. Problem Statement

The current system only detects fire and is unable to detect smoke separately. Also, the alarm is only to notify individuals in the Environment. To design a Robust, Safe and Reliable System which can detect any internal threats (Smoke, Fire, Gas Leakage) when the senior citizen is alone at home.

### II. Introduction

In Everybody's life the importance of Senior citizens is at respectful level because they are the people who have sacrificed their life to make us what we are today. We learn life lessons from them and avoid our mistakes. Hence it's our responsibility to take care of them inside or outside the home. Home security is the main concern, especially when you are living in city. Many times due to our negligence unintentionally, senior citizens may not feel secure at home. Many Smart home Systems where proposed which could monitor health issues for them.

But what about internal threats which are vitally important as health issues. The health is being monitored by the system and alarm is been generated in hazardous condition. They should feel very safe at home especially when they are alone. There are many threats at home due to many senior citizens may feel insecure or they may have fear in their mind that anything can happen to their health or life. So, who will help them? This problem can be solved with the use of various efficient and latest scientific technologies to some extent.

### III. Motivation

The main motivations for our proposed smart system are the various limitations that are in current or earlier smart systems which were used to secure senior citizens at home.

Some of the limitations are:

1. Cost of smart phone may not be affordable.
2. Functionality and applicability may not be understood easily by the senior citizens.
3. Systems may not work for all kind of threats at home.
4. Only health related issues like heart rate, ECG signals, respiration etc. are taken as safety parameters for senior citizens.
5. Gestures of the seniors from home may not be available accurately all the time. The system may record wrong gestures of the elders.

#### IV. Literature Survey

Fangxiu Jia, YujiaSun wrote about the Home monitoring System based on MEMS(Micro Electro Mechanical System) Technology which is used for motion sensing. It includes Temperature sensors for detecting temperature of the Environment in Celsius and Force sensors which rely on mechanical motion of MEMS sensors. In various scenarios as person falls on the ground the pressure is high so it raises the alarm. Intelligent home monitoring system based on ZigBee wireless sensors has been designed and developed to monitor the elderly person. [1].

Athanasios Bamis wrote about Behavior scope Real-time Human Monitoring System Behaviour Scope Framework is used, which is user-programmable that processes the streams of time stamped sensor data along with prior context information to infer activities and generate appropriate notifications. The system interprets the activities to generate summaries and other triggered notifications that are propagated cell-phone text messages. A network of PIR sensors records the rooms that the elder person visits over time. This network is comprised of Intel iMote2 sensors nodes equipped with COTS camera modules. [2].

B.Nandhini and R.Janani wrote about Smart Monitoring System for Elderly People were Wireless sensor network integrated with ZigBee modules of mesh Structure exists capturing the sensor data based on the usage of House-hold appliances and stores data in the computer system for further data processing. It consists of different types of sensors like MEMS, temperature and Heartbeat sensor with ZigBee module sensing units. Collected Sensor data are of Low level information containing only status of the sensor as active or inactive and identifying of the sensor. [3].

R. Gnanavel and P.Anjana wrote about Smart Home System using Wireless Sensor Network for Elderly People. A Smart Elderly home Monitoring System (SEHMS) is designed and developed to survive a fall, heart attack or stroke with much greater a fall and the senior gets help within an hour. The system is consisted of master chip IAP15F2K61S2 module, the clock module for timing, wireless data transmission smoke sensor module, and power supply module. When tested value if value exceeds the preset safety value, system will start to alarm. The GSM module and the wireless communication module based on 24L01 receive commands from the micro controller for data processing to achieve mutual wireless communication between various modules. [4].

S.Rajitha and T.Swapna wrote about A Security System Using GSM for Gas Leakage was Four Modules are used for detection and handling of various threats such as fire, smoke and gas leakage. The Mobile monitor and the data pertaining to tachycardia, bradycardia and falls throughout the network. The WSN Infrastructure consists of a group of nodes placed throughout the home. These nodes are capable of establishing a hierarchical network, receiving information from the mobiles nodes and routing the information to a computer with reduced computational capabilities and radio. And this is done seamlessly via transmission of signal to appropriate Module. [5]

#### V. Architecture

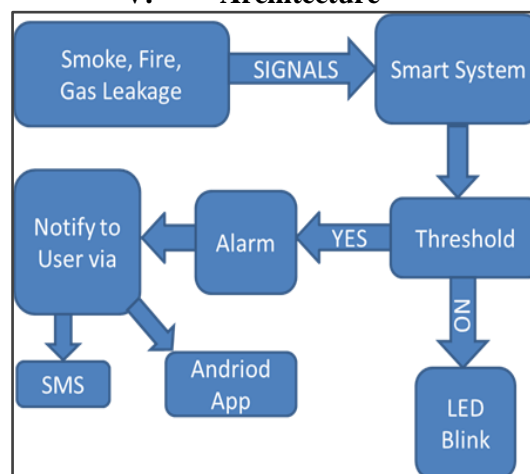


Figure 1: System Architecture

Specialized sensors are used to detect the smoke, fire, and smoke due to fire and gas leakage in the home. These sensors sense gases all the time and send signals to our smart system periodically.

□ **Smart System:**

This smart system makes its interface to the gas sensors/detectors and mobile phone. It converts the signals into data and compares the values with threshold set by the system. If the value received from the sensor is greater than threshold then it generates the SMS and sends it to the registered mobile otherwise it discards the values received from the sensors. It also makes an alarm and suggests corrective measures to the senior citizen at home through audio or text message.



**Figure 2:** Arduino UNO board with Atmega328p microcontroller.

□ **Generation of SMS & alarm:**

This is integral part of smart system. Depending on threshold values of gases, it generates SMS stating the type of gas, its threshold value and its current value. For example, type of gas: smoke, threshold value: 30 density, current value: 35 density.

□ **App:**

Once SMS had received from the smart system by the mobile phone, the person will come to know its severity of the problem faced by the senior citizen at home. Either he can send SMS to our caretaker or intended user.

## VI. CONCLUSION

Hence, we have successfully verified and checked the feasibility of our project idea. We have referred various papers in our Literature Survey and identified the Limitations in them. We intend to design a system which can overcome those limitations and research more and also eliminate any liabilities in our system as the system further develops. After deploying such system, we can easily provide enough and adequate security to our senior citizens at Home.

## VII. REFERENCES

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