# IOT-BASED ON SMART HOME ISSUES SECURITY AND PRIVACY SYSTEM

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***Abstract*** **-With the rapid development of the Internet of Things (IoT), the security and privacy of smart home systems based on IoT are more and more popular. As the key component of IoT, wireless communication and sensor technology are prerequisites for the security and confidentiality of smart home systems. Smart home systems integrate electronic information technology and computer control. By designing and installing various sensors in the home for collecting data, and then using the IoT platform for data transmission, the remote control of the home running state can be realized. Home security is guaranteed. This study designs the IoT architecture of a smart home, and then hardware and software are designed according to the system architecture. The hardware part is mainly analyzed from the image recognition module and speech recognition module. In addition, a stereo matching algorithm for smart video surveillance is proposed to optimize the accuracy of the surveillance system. Finally, the simulation results prove that the designed smart home systems have a low cost and high accuracy. It not only optimizes the performance of smart home systems but also improves the safety factor.**

## 1. INTRODUCTION

Smart Home Environments integrate multiple IoT device send services that collect, process, and exchange data. They provide users with several possibilities to control and adapt the status of their home, either manually or automatically. For that purpose, Smart Home devices and services exchange data with internal and external actors. These interaction stake place with mobile applications on end-user equipment (smartphone) and also with remote services in the Cloud. Due to their interconnected nature, Smart Home devices are subject to several security threats either from remote attackers or from inside the Home Area Network (HAN). Moreover, these threats have an impact not only on a user's data but also on his/her health and safety: this changes the accepted idea that the home is usually a safe place to live in. Smart Home Environments are an emerging domain and because the liabilities are not well defined, it becomes important for all actors to develop adapted security measures to prevent cyber threats. For that purpose, there is a need to secure Smart Home Environments and effectively reduce the threats.

## 2. LITERATURE SURVEY

### 2.1. AUTOMATIC SMART HOME SECURITY SYSTEM

Today is the world of advanced ubiquitous mobile applications which are used thoroughly to save energy and time. These applications ease the day-to-day life of common people. Based on these applications and technologies we designed an & quot; Automatic Smart Home Security System & quot;. An attractive market for a & quot;Smart Home Security System & quot; is busy families and individuals with physical disabilities.Users can control electrical appliances in the home or office via smart phone. The application will also provide secure notification and alarm for Burglary, fire hazards, and LPG leakage. This project aims at controlling every happening at home or office on your fingers.

### 2.2. IOT-BASED SMART SECURITY AND HOME AUTOMATION

Internet of Things is a system where appliances are embedded with software, sensors, and actuators Wi-Fi is one of the main wireless communication protocols for connecting different devices for the exchange of data over the Internet. IoT is implemented in smart home security to device embedded module for standalone operation of collecting and monitoring different sensor data for home security. This project focuses on building a home security system that will be wireless. Security over a network is achieved using Arduino Uno. This system was used for monitoring the status of the home by using different sensors.

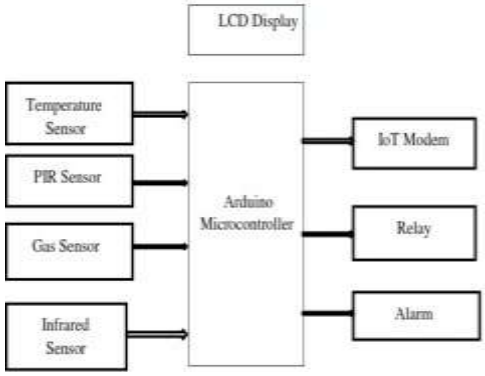
### 3.1 EXISTING SYSTEM

The recent developments in this technology which allow the use of Bluetooth and Wi-Fi have enabled different devices to have capabilities of connecting each other. Using a Wi-Fi shield to act as the micro- web server for the Arduino eliminates the need for wired connections between the Arduino board and computer which reduces the cost and enables it to work as a stand-alone device. The Wi-Fi module needs connections to the internet from a wireless router or a wireless hotspot and this would act as the gateway for the Arduino to communicate with the internet. With this in mind, an internet- based home security system for remote control is designed.

### 3.2 PROPOSED SYSTEM

The smart home system has a plurality of sensing nodes, including the door magnetic sensing node, the smoke detecting node, the gas detecting node, the infrared detecting node, and the temperature and humidity detecting node. Based on the data collection of each monitoring node in the home, the smart home system can realize real-time information transmission with the network layer.

### 4. BLOCK DIAGRAM




### BLOCK DIAGRAM DESCRIPTION

4.1 ARDUINO MICROCONTROLLER

Arduino is an open-source electronics platform based on easy-to-use hardware and software. Arduino boards can read inputs - light on a sensor, a finger on a button, or a Twitter message -and turn them into an output - activating a motor, turning on an LED, publishing something online. To do so you use the Arduino programming language (based on Wiring), and the Arduino Software (IDE), based on Processing.

Why Arduino?

Thanks to its simple and accessible user experience, Arduino has been used in thousands of different projects and applications. The Arduino software is easy-to-use for beginners, yet flexible enough for advanced users. It runs on Mac, Windows, and Linux. Teachers and students use it to build low-cost scientific instruments, g, and robotics. Designers and architects build interactive prototypes.

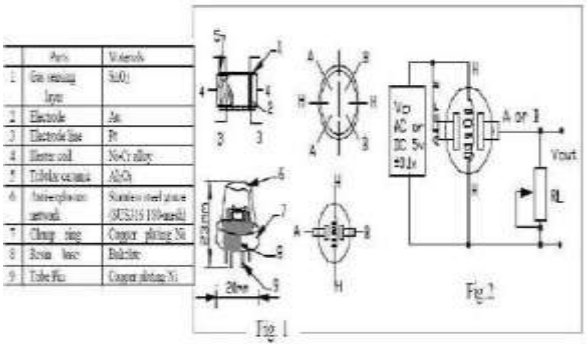
- Cross-platform - The Arduino Software (IDE) runs on Windows, Macintosh OSX, and Linux operating systems. Most microcontroller systems are limited to Windows.

- Relatively inexperienced users can build the breadboard version of the module to understand how it works and save money.

4.2 GAS SENSORS

Gas sensors detect dangerous gas leaks in the kitchen or near the gas heater. This unit detects 300 to 5000ppm of Natural Gas. Ideal to detect dangerous gas leaks in the kitchen. The sensor can be easily configured as an alarm unit. The sensor can also sense LPG and Coal Gas.

**Structure and Measuring Circuit**




The gas sensor is shown as Fig. 1 sensor composed of a micro AL2O3 ceramic tube, Tin Dioxide (SnO2) sensitive layer, measuring electrode, and heater fixed into a crust made of plastic and stainless steel net. The heater provides necessary work conditions for the work of sensitive components. The enveloped MQ-5 gas sensor has 6 pins,4 of them are used to fetch signals, and the other 2 are used for providing heatingcurrent.

The electric parameter measurement circuit is shown in fig. 2E. Sensitivity characteristic curve Sensitivity characteristics.

RESULT:

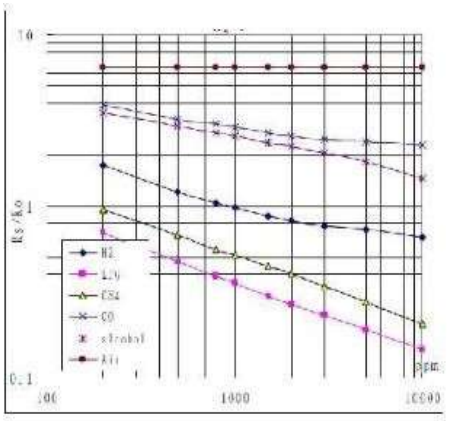


**Fig.3 shows the typical Sensitivity characteristics of the MQ-5 sensor for several gases.**

Temp: 20
Humidity: 65%
O2 concentration 21% RL=20kΩ
Ro: sensor resistance at 1000ppm of H2 in the clean air.
Concentrations of gases.

ADVANTAGES AND APPLICATIONS

ADVANTAGES

- Accuracy
- Low Cost
- Simple Design

APPLICATIONS

This project can be used in our homes for security purposes and it can be used for any place that needs security.

## CONCLUSION

With the improvement of people's living standards and the popularization of the network, security and privacy protection have become more and more popular. Especially the concept of IoT and smart home systems has promoted the application of electronic products in the family. Smart home systems can guarantee the security and privacy of life and effectively improve the efficiency of life. The development of smart home products has become a hot topic. It relies on seamless compatibility with the IP network and remote real-time video processing capabilities provided by high-performance embedded processors. It provides technical support for smart homes and has broad marketapplication prospects.

1) Integrating Zigbee, WiFi, GSM/GPRS, and other technologies, this study puts forward an overall design idea for the security and privacy of smart home systems via advanced IoT technology.

2) According to the structure of smart home systems, based on the consideration of economy and low consumption, the design of hardware and software of the system is completed, which provides technical support for the realization of intelligent monitoring.

## REFERENCES

[1] Gómez J, Oviedo B, Zhuma E. Patient monitoring system based on internet of things[J]. Procedia Computer Science, 2016, 83: 90-97.

[2] Rau P L P, Gao Q, Wu L M. Using mobile communication technology in high school education:Motivation, pressure, and learning performance[J]. Computers and Education, 2008, 50(1):0-22.

[3] Ferreiros J, Pardo J M, Hurtado L F, et al. ASLP-MULAN: Audio speech and language processing for multimedia analytics[J]. Natural, 2016 (57): 147-150.

[4] Yuan J S, Zhang J, Wang Y. Applied Technology in Smart Home Furnishing Control System in the Internet of Things Based on SCM Microcontroller and GSM[J]. Applied Mechanics and Materials, 2014, 540:372-375.

[5] Wang Y, Wang H, Li X. An intelligent recommendation system model based on style for virtual home furnishing in Three-Dimensional scene[C]//2013 International Symposium on Computational and Business Intelligence. IEEE, 2013: 213-216.

[6] Shi C B, Li WB, Wang K H, et al. Intelligent home furnishing management system[J]. Electronic Design Engineering, 2014, 22(3):136-138.

[7] Zhang S, Xiao P, Zhu J, et al. Design of smart home control system based on Cortex-A8 and ZigBee[C]//2014 IEEE 5th International Conference on Software Engineering and Service Science. IEEE, 2014: 675-678.

[8] Alagoz B B. Obtaining Depth Maps from Color Images by Region Based Stereo Matching Algorithms[J]. Computer Science, 2008.

[9] Banks J, Bennamoun M, Corke P. Fast and Robust Stereo Matching Algorithms for Mining Automation[J]. Digital Signal Processing, 1999, 9(3):137-148.

[10] Hamzah R A, Kadmin A F, Hamid M S, et al. Improvement of a stereo matching algorithm for 3D surface reconstruction[J]. Signal Processing: Image Communication, 2018, 65:165-172.

[11] Hvistendahl M. China pushes the 'Internet of Things[J]. Science, 2012, 336(6086):1223.

[12] Tsai M F, Ye C K, Sinn A. Smart service relying on the Internet of Things technology in parking systems[J]. Journal of Supercomputing, 2016,13(1):1- 24.

[13] Zee E V D, Scholten H. Spatial Dimensions of Big Data: Application of Geographical Concepts and Spatial Technology to the Internet of Things[J]. Nature Genetics, 2013, 22(1):13