ORIGINAL RESEARCH PAPER

Information Technology

SURVEY ON ADVANCED AND THE BEST SOLUTION FOR HOME SECURITY USING SENSOR AND IOT

KEY WORDS: Arduino, GSM, PIR sensor, Dh-t22, MQ2 sensor

P. Ajitha

Department of Information Technology, School of Computing Sathyabama Institute of Science and Technology, Chennai, India.

ABSTRACT

Security is becoming an important issue everywhere. Home Security is becoming necessary now a days as the possibilities of intrusion is increasing day by day .Safety from theft, leaking of raw gas and fire are the important requirements for home security system. However, the GSM (global system for mobile communication) based security systems provides enhanced security as whenever a signal from sensor occurs, a text message is sent to a desired number to take necessary actions. Here we are using an antitheft reporting system which will report the owner by ringing alarm and sending text message. Also for the safety system in case of fire or gas leakage it will report the owner by sending an SMS and also by ringing an alarm.

I.INTRODUCTION

Increase in Usage and trend of mobile computing had thrown every individual in a comfort zone that it helps him to rule the entire world, control it and manage it in a best way. The only thing that he should compromise is in the security threats behind the usage of wireless communication, one should have a control of all his belongings and he should constantly monitor it, it had made possible with the trends of IOT along with sensor technology. It helps every individual to monitor his home from his hand and to keep track of his home and to get intimated about the changes happening in and around his home with no cost of time, it can be achieved by usage of open source resources like Arduino, zig-bee e.t.c. These are the main controllers which are used as a micro controllers which controls the entire system. The usage of open source in IOT has made several students to bring their thoughts into real world objects Which are the latest discoveries becoming boon to our upcoming technologies.

The power consumption of hardware which would be major challenge has been overcome in these devices as they use the minimal usage. The lifelongevity of the resources has increased a lot and response and security are made in a best way.

Home automation increases the human life safety and security, meanwhile it leads to new threats over the security issues due to wireless technology where someone can misuse it for their personal benefits. It leads to the innovation of secured home automation which is needed for every human to lead his life in a happiest way in current socio-economic span. Internet usage has been evolved as a basic need for human to compete with his tasks either in his workplace or at home. Internet is a wireless source in which intruders can steal our details and make us to struck, observing all these issues secured internet usage is being developed with the evolvement of trends of internet of things. The wireless sensor technology is the backbone of IOT where sensors play a major role in data collection and open source systems like Arduino or zig-bee are the system controllers like microprocessors which controls all the taskshappening and even made the tasks to be take place in a systematicway. GSM and WI-FI as a message sending systems helps to send message about the detected action by sensors.

II.LITERATURE SURVEY

Homes of 21st century will become more and more self-controlled and automated due to the comfort it provides. Along with comfort security of resources had become the challenge to us. The main objective of this paper is to design and implement the security system which meet our needs and helps us to keep our resources as safe and secure as possible and even help us to monitor them from our work place. Usage of Arduino and GSM along with home monitoring sensors helps us to achieve our challenges as easier as possible. Open sources like Arduino-UNO is used here.

Home Security is designed using ARM and Zig-bee which is self-organizing, low power consumption, less complex wireless technology based on IEEE802.15.4 standard. Author[1] works with short range distances with wireless connections as Bluetooth and WI-FI. The design composed of parts control unit, sensor module, GPRS module, USB camera. Which are integrated using zig-bee and get the best results out of it. The main control Zig-bee keeps track and communicates with all the devices and sends and receive instructions between the sensors and transmitting agents.

The security mechanisms of gsm are applied in following ways based on the sim, the gsm handset and gsm network. The sim in [2] contains individual authentication key and ciphering key, the gsm handset consists of ciphering logic and the gsm network has encryption logic. Here gsm is the main controller all the operation comes out from gsm and enters into system by gsm. Gsm is the media between the system and user. The system is protected with password to prevent the misuse of it.

The main objective in [3] is to provide a smarter and secure residential place to every individual with low cost and higher security. Scale devices such as sensors detect for environmental changes, if detected alerts the owner about the issue instantly. It uploads the alerts to dashboard and we can see those detected actions from dashboard and we can find analysis from these in a graphical view. It proposes data in motion exchange system to facilitate the machine to machine communication in a better and secure way.

The prototype in [4] consists of 3 modules, sensor module consists of 3 sensors Proximity, PIR and Temperature sensor, Microcontroller unit as Arduino-uno, Gsm module. Gsm acts as a intermediate between user and system and it is responsible for actions from system and taking responses from user. Sensors acts as detecting agents and checks for environmental changes constantly if detected any changes sends message to the gsm about the changes and GSM alerts the owner about the detected actions.

The paper [5] discusses the development of home security and automation using field programmable gate array, the user can interact with the system via web interface and can monitor it effectively. It controls the home appliances, in and around the home in an effective manner. The system had been designed using field programmable gate array hardware as an raw source, followed by software design associated with c programming along with web design programming which helps user to communicate with system. The System design is divided into 2 parts namely hardware design and software design. Hardware design consists of real time operating system, networking capable system and Hardware input output system. Software design consists of Http web server and input output system.The integration of hardware and software design produces output and web interface shows those things and is the only way of communication between user and system communication is of 2 way type which helps for better understandability.

The system design helps us to monitor, measure and control the remote devices over the internet using Zigbee as a main controller and sensing devices like sensors. In Zigbee network end devices collect and forward data to a coordinator. Internet gateway can be

integrated with Zigbee using WSN Zigbee network, Zigbee data sequence is converted to ipv6 transmission by the Zigbee gateway. Zigbee wireless sensor network known as Zigbee WSN along with its component XBEE s2 are the monitoring devices which has an ability to monitor for a range of distance and they send the data recorded in then to Zigbee controller which is the sole decider to send alerts to user.

The proposed system is designed with monitoring sensors and controller along with drone and robot which replaces the human in providing security to the home, the drone and robot are controlled by the container and are allowed to monitor the entire home with help of sensors along with drone and robot. This sytem is a combination of Zigbee wireless controller, GSM and Wi-fi , which in terms helps the system to work more efficiently. Agent based infrastructure and dynamic security are the major challenges faced in designing and are overcome with these challenges by providing a better solution to make the system to work in an effective manner.

III.CONCLUSION

In this paper, the importance of safety and security of our resources and monitoring them by our palm from any location is explained and implemented in a simple and perfect manner. The usage and importance of Arduino, GSM, WIFI and sensors in home security management tasks is briefly defined.

IV.REFERENCES

[1].   Solution of Home security based on ARM and ZigBee by GONG Shang-FU and YIN Xiao-QUING in 2016 International Symposium on Computer, Consumer and Control (IS3C), Pages: 89 - 91, DOI: 10.1109/IS3C.2016.33
[2].   Design and Implementation of a GSM Based remote home security and appliance control system by G. M. Sultan Mahmud Rana; Abudullah Al Mamun Khan; Mohammad Nazmul Hoque; Abu Farzan Mitul in 2013 2nd International Conference on Advances in Electrical Engineering (ICAEE), Pages: 291 - 295, DOI: 10.1109/ICAEE.2013.6750350
[3].   SCALE: Safe Community Awareness And Alerting Leveraging The Internet Of Thing by Kyle Benson; Charles Fracchia; Guoxi Wang; Qiuxi Zhu; Serene Almomen; John Cohn; Luke D'arcy; Daniel Hoffman; Matthew Makai; Julien Stamatakis; Nalini Venkatasubramanian in IEEE Communications Magazine Year: 2015, Volume: 53, Issue: 12 Pages: 27 - 34, DOI: 10.1109/MCOM.2015.7355581
[4].   ADVANCED LOW-COST SECURITY SYSTEM USING SENSORS, ARDUINO AND GSM COMMUNICATION MODULE by Vaibhav Sharma, Chirag Fatnani , Pranjal katara,Vishnu Shankar in IEEE TechSym 2014 Satellite Conference, VIT University, 7th-8th March
[5].   Sensor Based Home Automation and Security System by Mansour H. Assaf; Ronald Mootoo; Sunil R. Das; Emil M. Petriu; Voicu Groza; Satyendra Biswas in 2012 IEEE International Instrumentation and Measurement Technology Conference Proceedings, Year: 2012 Pages: 722 - 727, DOI: 10.1109/I2MTC.2012.6229153
[6].   Towards the Implementation of IoT for Environmental Condition Monitoring in Homes by Sean Dieter Tebje Kelly, Nagender Kumar Suryadevara, and Subhas Chandra Mukhopadhyay, Fellow, in IEEE Sensors Journal.
[7].   Intelligent Home Security System Using Agent-based IoT Devices by Zhaoqing Peng; Takumi Kato; Hideyuki Takahashi; Tetsuo Kinoshita in 2015 IEEE 4th Global Conference on Consumer Electronics (GCCE) , Pages: 313 - 314, DOI: 10.1109/GCCE.2015.7398644