

RESIDENT INTRUSION DETECTION USING WI-FI ENABLED IOT FOR SMART HOME WITH ANDROID SUPPORT

Srinidhi M.S¹

*Department of Computer Science and Engineering
Meenakshi Sundararajan Engineering College
Chennai, India*

Abinaya .P²

*Department of Computer Science and Engineering
Meenakshi Sundararajan Engineering College
Chennai, India*

Mrs.Yamuna S³

*Department of Computer Science and Engineering
Meenakshi Sundararajan Engineering College,
Chennai, India*

Ezhilarasan.P⁴

*R&D Engineer
National small Industries
Chennai, India*

Abstract -Innovation and automation has made our life simple, home automation is one such emerging technology which empowers the residents to have wireless and provides security to the home. There is a plethora of IoT setups available but most of them have restricted compatibility and are tailor-made for manufacturer supported devices. In order to provide a cost-efficient solution, a generic, all product supporting Wi-Fi based remote home automation scheme using a Raspberry PI, PIR sensor and a vibration sensor is proposed. The connected devices are monitored and controlled through a mobile application from anywhere across the globe. Various sensors like Vibration sensor to detect vibration and PIR motion sensor to sense the movement in the area of deployment are used to comprehensively monitor the ambience of the home environment. Through Android application continuous monitoring of the house is possible and Text to speech conversion helps in communication with the visitors.

Keywords -security; smart home; internet-of-things (IoT); Intrusion Detection System, Intruders.

I. INTRODUCTION

The intrusion detection is a software which is used to detect malicious activities or abnormalities, the intrusion detection along with IOT enables the devices of everyday use to be networked together. With the development of IOT the intrusion detection can be integrated with various sensors. With intrusion Detection and video monitoring using IoT devices, the systems in smart buildings or homes are able to actively obtain the information of occupancy and continuously monitor the house. Nowadays the Security in the house is compromised so the smart home system has become a necessity. The Smart.home system enhances the home security by continuous monitoring.

II. LITERATURE REVIEW

In [1], Waheb A. Jabbar postulated various conventional techniques for monitoring homes and their security. It uses a prototype, IoT@HoMe developed with an algorithm to monitor our home conditions and control the home appliances over the Internet anytime and anywhere.

In [2], Qiuyan Lyu provides the users with control of smart devices, but the smart homes are facing many issues in the privacy and confidentiality side when accessed remotely. This focuses mainly on providing secured authentication through third parties than concerns about privacy leakage. In our system, we use a scheme IFTTT which aims in remotely accessing our home system more privately.

In [3], Weixian Li here deals with the energy consumption and meter readings which can be made digitally, by reducing the manual work. But the smart home network is vulnerable to energy theft. In our system, we use a smart energy theft system (SETS) that is used for prevention from energy thefts, despite the lack of energy monitoring devices. And enhance the security of the IoT-based smart home.

In [4], It explains about intrusion which takes place based on various cyber attacks. In the current system, we propose an Intrusion Detection System[IDS] to detect the motion of any intruder based on their character and identify the type of attack that has been deployed. This distinguishes the type of network, whether malicious or not and easily detects when the attack has taken place.

In [5], It explains about not having control over our homes when not present. So, we can't always monitor our home's condition, and it may lead to any mishappening at times. Our system provides accessibility to monitor and

control our home from anywhere and at any time needed. This helps to have access to our home always.

III. MOTIVATION:

Nowadays, people are also going out for challenging jobs leaving the house unmanned. Such a situation creates security hazard and may result in theft of valuable items in the house. So, we had thought of a solution for the above issue and came out with an intelligent device using IOT which is one of the latest technology in the world.

In our proposed system, we aim at enhancing the security at our homes. Usually, the security features at our home is not so safe and is not reliable all the time. Due to this, we have developed an intrusion detection system(IDS) to strengthen the security. This system helps in detecting any intrusion happening and notify us immediately at the moment. And camera's have also been used, which continuously monitor our home and we can get caught of the intruder using this. In this proposed system, we are continuously updated with the happenings at our home and are alerted. By using this system, we can safeguard our homes and be safe always.

ALGORITHM:

Our system makes use of sensors like PIR and Vibration sensors.

The PIR sensors are used to detect any presence of intruders at our residence.

When the intrusion takes place, the buzzer/alarm would ring and we would be notified.

Along with this, while the buzzer starts to ring the picture of an intruder would also be captured immediately.

Next is the vibration sensor, in which we get to know about the happening of the intrusion.

In this when the sensor has been active for some time, then a video of 6 seconds will be captured.

If the sensor has been active for 17 seconds, then notification will be sent from our application to the user and the recording can be viewed through a live camera.

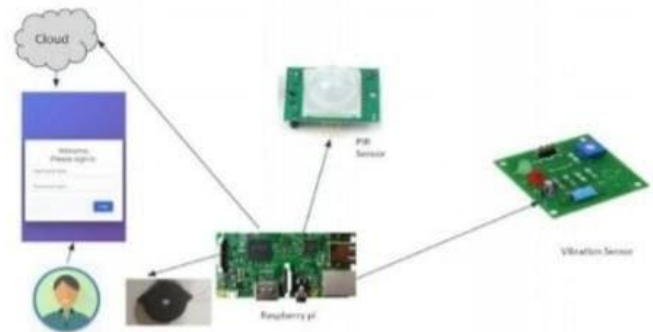
Along with these measures, we have also developed a text to speech conversion, which would be displayed at the entrance of our homes.

We use cloud storage, in which our values get hosted on how monitoring takes place.

· If the status is normal, then there is no intrusion. If the value changes to abnormal then, intrusion is taking place.

· Using this we can easily know whether any intrusion has taken place or not.

· Then, the camera is made use for continuous monitoring of our home, at any time and anyplace.



Raspberry Pi: The Raspberry Pi 3 Model B+ is the Fourth generation Raspberry Pi. This powerful credit-card sized single board computer can be used for many applications and supersedes the original Raspberry Pi 2 Model B and Raspberry Pi 3 Model B.

In our system Raspberry Pi integrated with a PIR sensor, vibration sensor, buzzer and camera. Through Wi-Fi it is continuously connected to a network.

PIR Sensor: PIR motion sensors to sense the movement in the area of deployment are used to comprehensively monitor the ambience of the home environment. Whenever the PIR sensor detects abnormality the buzzer rings and the camera takes a picture.

Vibration Sensor: Vibration sensors are sensors for measuring, displaying, and analyzing linear velocity, displacement and proximity, or acceleration.

In the system, vibration sensor detects vibration, whenever the sensor detects an abnormality the buzzer rings and a video is captured for 6 seconds. When the threshold is reached then the user is notified with a short video.

Buzzer: The buzzer has two different tones of ringing, one tone for the PIR motion sensor and other for the vibration sensor.

Cloud Storage: Cloud computing is the on-demand availability of computer system resources, especially data storage and computing power, without direct active management by the user.

The cloud storages receive continuous updates from PIR sensor and Vibration Sensor, the datalog of sensors has the sensor value along with its current state ,either normal or abnormal.

Android application: An Android app is a software application running on the Android platform. Because the Android platform is built for mobile devices, a typical Android app is designed for a smartphone or a tablet PC running on the Android OS.

Our application has login for authentication purposes. and the application is connected to the cloud from it we can view the sensor values and monitor our home through camera feed. The user is notified during an abnormality and can communicate with the visitor, the application converts the speech to a text and transmit to the cloud. At the receiver end the message is displayed on the screen.

IV. CONCLUSION & FUTURE WORK

The main objective of home automation is to provide security. This paper describes the secure structure design and its implementation that provides flexibility and secure smart home systems based on Intrusion Detection system and IoT. Smart home intrusion detection focusses on enhancing and providing reliable security to our residence. This paper focuses on providing protection to our homes. This is currently in the developing stage, and this project would be a great benefit for security of the household.

There are many possible future works that can be added to the Smart Home system, the two way communication can be enabled between the visitor and the user, image processing can be used for the intrusion detection system so that the suspects can be narrowed down. The central alarm system can be developed so that the security of the house can be intimated. When the Smart home is enabled in every household the crime rate will reduce drastically.

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