

IoT based security system and intelligent home automation multi monitoring and control systems

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ABSTRACT

This paper presents the execution of savvy Smart Home with frameworks and propelled advances. A Home Automation System uses the technology of IoT for the screening and controlling of the electrical and electronic appliances at home from any remote area by essentially utilizing a Smartphone. The key control framework utilizes a remote Bluetooth system and a remote IoT strategy that gives remote access to the advanced cells. The framework configuration does not expel the current electrical switches yet it gives a more secure control over it with the low voltage utilization method. This framework is intended to control electrical gadgets all through the house easily by introducing it, usability, savvy plan and actualize. There has been rising interest for a secure framework that must be tried, true and fast in reaction to the ventures and organization. Arduino makes the circuit and programming technology to design and operate wireless water monitoring system. The Water level in the tank is displayed on the Smartphone by the Water level app.

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1. INTRODUCTION

In the present days, home computerization is getting to be plainly fundamental, with the goal of enhancing our living conditions. Comfort and simplicity of utilizing home machines is the outcome that Smart home is putting forth. Brilliant home offers a cutting-edge lifestyle in which an individual gets the chance to control his whole house through an advanced cell, from turning on a TV to locking/opening entryways; it additionally offers a proficient utilization of vitality [1].

In any case, to get or secure such framework introduced, this shall cost a considerable amount of money, that is the significant reason of why home Automation has not received much demand and consideration, adding to that, likewise, the intricacy of introducing it and arranging it. In this manner it is fundamental to alter it to be more economical and simple to arrange, if this is conceded to individuals then they will gain it in their homes, workplaces and schools. As it were, a framework alteration for the savvy house is required with a specific end goal; to bring down the cost of applying it to houses. Likewise, home Automation offers simplicity to both: body and soul, to incapacitated and additionally the senior citizens, in their homes by only a single tick to do what they need as expressed previously [2].

The keen house utilizes the Internet of Things innovation for observing and controlling of the electrical and electronic machines at the house from wherever of the world if a web connection could be found, yet It would be also possible from about the neighbourhood through a reachable Wi-Fi connection, by

essentially utilizing a Smartphone [3]. While the utilization of RFID innovation is expanding over a scope of various businesses, the related security and protection issues should be precisely tended to fingerprint [4].

Water level remote control procedure is an equipment based venture; which is utilized to control the level of any liquid via a controller [5]. We pick the remote procedure on the grounds of: successful arrangement, Cost-Avoiding long wiring-, Eliminating trenching and link plate, Facilitating answers for applications that upset the physical impediment, Increased operational security by consistent observing, Mobile and adaptable checking, Ease of maintenance through development, Low running cost, Ease of introduction. As for the suitability for oil & Gas industry, this could be used for Well-head and Pump checking framework, Pipeline Pressure, stream and valve observing, assurance framework checking, break identification checking and underground gas stockpiling observing. Pump/compressor station control frameworks [6].

2. SMART HOME

The Smart home has been characterized as the joining of innovation and administration through a home system for a superior personal satisfaction shown in Figure 1. It has been utilizing propelled PC and system correspondences innovation, incorporated wiring innovation naturally consolidated with all subsystems, for example, security, lights control, window ornaments control and data machines through system coordinated Intelligent control and administration. Moreover, Door Lock framework Using RFID innovation and fingerprint, checking of water level in tanks, additionally, insurance of water-pumps if the water does not touch its base [7]. Smart home has been around for a long time and things have been accessible for an extensive number of years, however, no one's course of action has become through to the standard yet. The savvy house utilizes the control frameworks and data innovations to decrease the requirement for human work in the generation of merchandise and enterprises. A savvy house incorporates different sub-frameworks that are altogether controlled by an ace Smart Home controller [8, 9].



Figure 1. Smart home

3. IoT TECHNIQUE

IoT (internet of things) is a world of genuine, virtual and computerized situations joined altogether to make a keen domain; which makes life simple. It is another time of figuring innovation in which machines associate and speak with different machines, items and condition. This new innovation can possibly enhance our lives by utilizing an "order and-control" technique. It is a transformation of the Internet in which objects make themselves conspicuous [10, 11].

Articles can convey data among them and can take vital choices at whatever point required. Correspondence has been stretched out by means of the web to everything around us. At the point when articles can speak with each other, by means of the web, we have to take a final favourable position of remote access. A definitive objective of IoT applications is to mechanize frameworks as opposed to utilizing manual frameworks, to enhance the nature of living [12].

In this day, the Internet serves to be a famous method for correspondence. From the end client's perspective, an Internet-based Smart house is extremely helpful, simple, adaptable and shoddy. Numerous gadgets now have Wi-Fi and can interface with Smartphones or PCs [13]. Be that as it may, these gadgets

can't speak with each other or else require extra gadgets to do as such. In this manner, these gadgets should be bound together, with the end goal that they can be observed and controlled utilizing one single program or gadget, example controlling lights, fans, aeration and cooling systems, stove, cooler, TV and so forth by an application on a Smartphone. This gives clients more control of their homes and can improve numerous manual activities [14].

4. ANDROID SMART PHONE

In this part of the project, an android phone (Samsung Galaxy S Advance) is used as the remote controller for the user alongside with an App Called Anwer (Anwer app. Is designed by Anwer Satar to this purpose). Shoot screen of Anwer app as shown in Figure 2.



Figure 2. Shoot screen of Anwer app

Anwer app is a simple Android app that will make controlling the pins of Arduino-Uno from an Android phone wirelessly possible. Anwer app employs a simple Android user interface to control Arduino Uno's digital and PWM pins, send text commands to Arduino-Uno and receive data from Arduino over Bluetooth serial module, also open the out-door which can be opened by using RFID technology. In Figure 3 is application of water level. In Figure 4 is application of wifi. In Figure 5 is application of Bluetooth.



Figure 3. Application of water level



Figure 4. Application of wifi



Figure 5. Application of bluetooth

5. RESULTS

In the private part, it has successfully controlled the dual control process with home TV, lighting and other Smartphones using mobile represented applications that have been designed for this purpose where the control and operation/shutting off the device itself is either by a connection using Bluetooth; controlled by your application Bluetooth Or by means of a local or internal Wi-Fi connection, or by global IP.

It is controlled by the IoT application. Where the same device is turned off or operated from any application either by employing wifi or employing Bluetooth as shown in Figure 6. Ever wanted to Protect the water pump When there is no water flow, in the case of continuous operation this system turns off the water pump. In this part of the project, we used the water flow sensor (pow110d3b Model). Block diagram of protection of water-pump as shown in Figure 7.

In this system of the house the water level in the tank is monitored wirelessly using the ultrasonic sensor HC-SR04 sensor where the water level in the tank is displayed in the screen of the mobile application was designed for this purpose can also through the same application extinguish and run water-pump In addition was Water flow sensor (pow110d3b) with Arduino switches off the water-pump in case of water breakage as shown in Figure 8. This system can also be used with oil and oil tanks or any other liquid.

Gas sensor module through this system, which consists of the sensor (MQ-2) and the LCD screen (LCD 16*2), displaying the quantity of gas and LPG and if the is fire sensor is detecting smoke, which is also displayed on the screen. Sensitive material of MQ-2 gas sensor is SnO₂, which has lower conductivity in clear air as shown in Figure 9. In this work an improvements have been done on the past models accessible [9, 13-15]. More options are available.

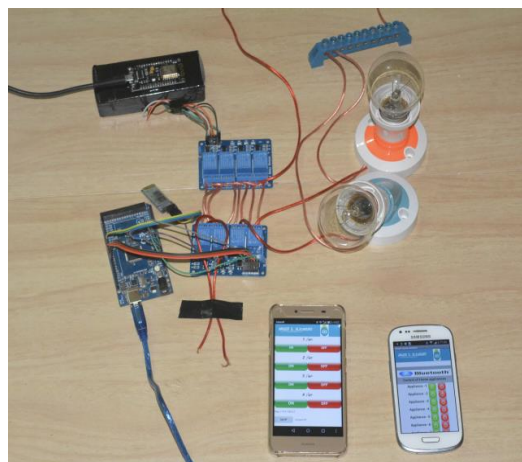


Figure 6. Bluetooth and Wifi module

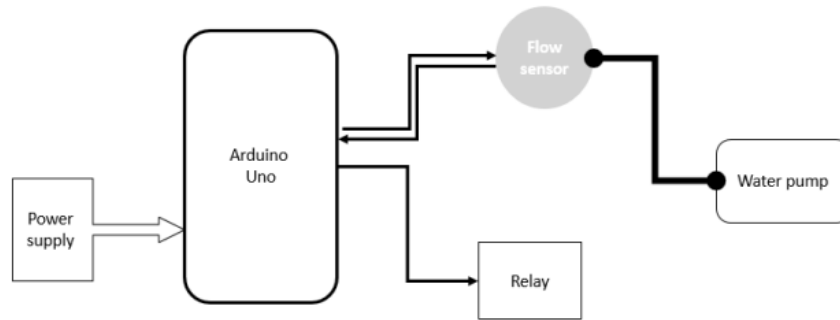


Figure 7. Block diagram of protection of water-pump

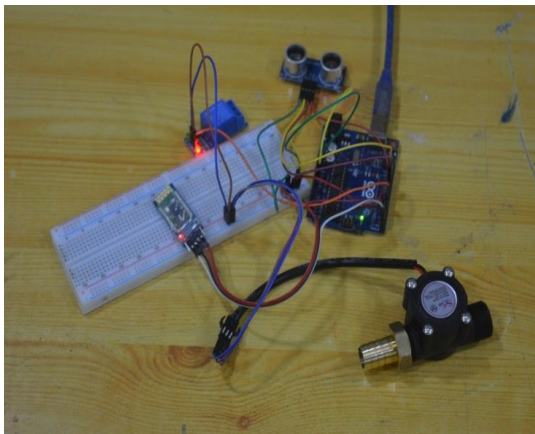


Figure 8. Water monitoring wireless and protection of water-pump

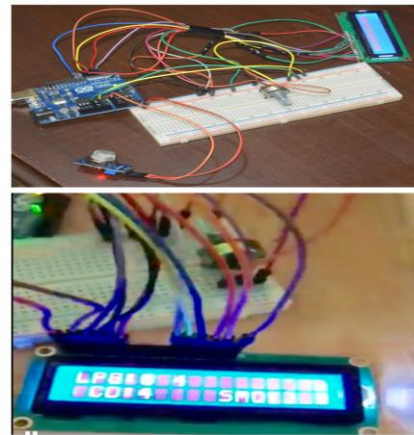


Figure 9. Gas sensor module

6. CONCLUSION

It can be reasoned that IoT based security system and intelligent home automation multi monitoring and control systems was a win. The arrangement of keen control comprises of Arduino sheets, a Bluetooth Module, Ethernet shield, Android application for the Bluetooth method (Anwer) and application. For IoT method (Smart House), control attachments and home apparatuses. Furthermore, the System of RFID based security and access control system comprises of an Arduino board, RC522 RFID module, Servo Motor (S3003 SERVO), Red LED, Blue LED and a Buzzer. Additionally, it can be reasoned that the targets of this venture have been effectively met and they are as per the following:

- Design and actualize a practical Smart home yet a productive one.
- Design an easy to use and a protected framework to control home machines particularly planned to help the senior citizens and incapacitated.
- Create a straightforward yet solid home Smart house utilizing Arduino as a microcontroller that will be the medium between the android and the home machines.
- Work the Security framework utilizing RFID innovation based Arduino microcontroller
- Establish the water level checking and monitoring by utilizing the application on Android Smart telephone, Work the lighting framework is more intelligent by utilizing the PIR sensor.

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