Wireless Sensors for Home Monitoring System Using IoT

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Abstract – The versatile and low value IOT based mostly E-Surveillance and security system for home. Arduino Mega 2560 microcontroller with internet server that has IP property allowing the access of dominant devices and appliances remotely. Online applications are used for controlling the devices. Devices like lightweight switches, temperature sensing element and security system are integrated with the planned surveillance and security system. It offers a communication protocol for managing the house.

Index Terms – Arduino, Luminance Sensing Resistor, Passive Infrared Sensor, Temperature Sensor, Two channel relay, LCD display.

1. INTRODUCTION

E-Surveillance is that, the things are being controlled mechanically, it uses the essential tasks of turning ON/OFF the devices, either remotely or in proximity. In today's world the security systems plays an import role in protecting the life by using protection systems like control unit like sensible home, trespasser control, access control, fireplace detection, etc. A IOT based mostly E-Surveillance and security house is one that's equipped with light-weight, temperature and security system which will be controlled via the net associate degree IOT based mostly E-Surveillance and security system focuses on dominant home electronic devices whether or not you're within or outside your home. E-Surveillance provides a personal the power to remotely or automatically control things round the home. surveillance

The main reason behind using of remote management of devices over the internet platform from anywhere around the world, has come to a reality. The current innovations in technology allows the utilization of different devices by connecting them with one another by using a small internet server called the Arduino which helps in eliminating the wired connections between the Arduino board and personal computer by figuring as a standalone device. The Wi-Fi connection from a wireless router wireless hotspot allows the Arduino to speak via internet.

OVERVIEW OF THE IOT PRIMARILY BASED E-SURVILLANCE AND SECURITY SYSTEM

The micro-controller is used for getting values of devices connected through different sensors [11]. The temperature sensor browses the temperature values and the light Dependent resistor device controlls the automatic on and off of the light by determining the intensity of the day light. Passive Infrared sensing element (PIR) is used for detecting the movement of a person within the home by turning on the protection system.

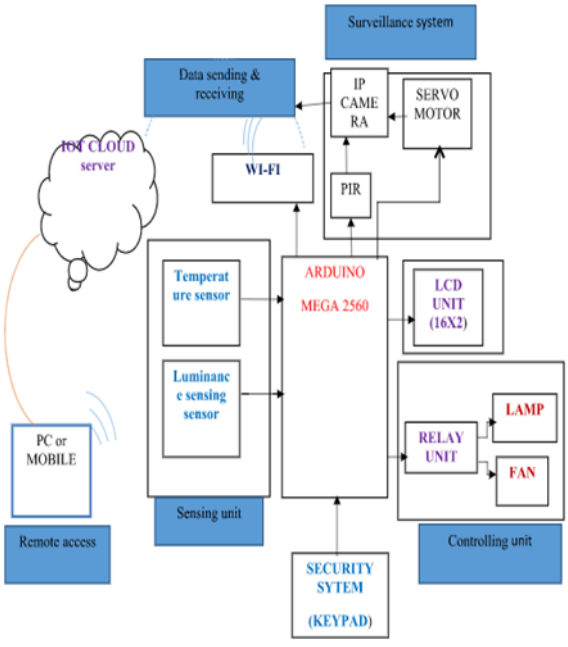

Fig 1 Architecture of the proposed system

Relay switch is used for sending the signals from micro-controller to the devices which are connected it for on and off actions. Internet portal is used as an authentication system which has an username and password to find the genuine of the user [4]. It acts both as a data input and output device to

regulate the house appliances and to scan the appropriate values of physical conditions.

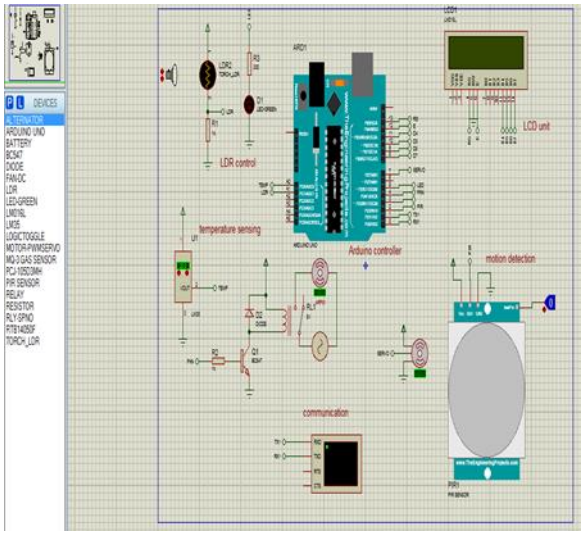

Fig 2 Block diagram of Arduino controller using Proteus 8.5 simulation

2. DESIGN AND MPLEMENTATION

The main area of this method is using Arduino Mega 2560 small controller which acts as a micro internet server and also as an interface for all the hardware modules. There are two modules used: hardware interface module and package communication module. All communication and controls during this system undergo the microcontroller. In addition to it the functionalities for regulating the light and fans are used with the relay system. Additionally, motion detection is used for identifying the intrusion and all these are controlled from the net application.

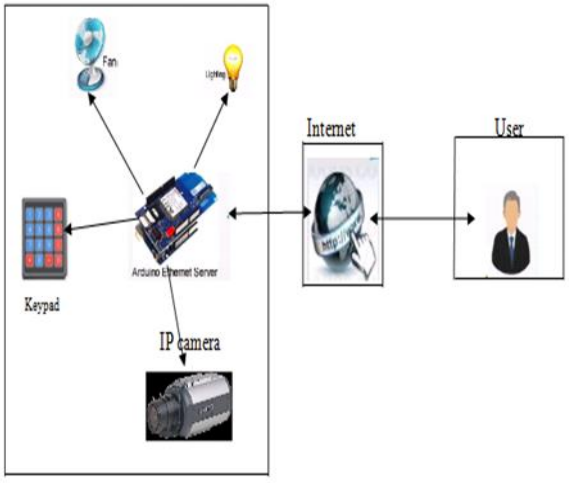

Fig 3 System architecture of theIOT based E-Surveillance and security system

Secure Wi-Fi technology is employed by server, and hardware interface module to speak with one another. User could use an equivalent technology to login to the server internet primarily based application. if server is connected to the net, therefore remote users will access server internet primarily based application through the net exploitation well-suited application program.

The new system has a good flexibility by using Wi-Fi technology which interconnects its distributed modules to the home security server which may decrease preparation value and can increase the flexibility of promotion and reconfiguration of the system

Hardware:

Arduino controller will sense the atmospheric conditions by allowing the signals from a detector and influences the environment through actuators. An analog temperature detector could be a chip that tells you what the close temperature. PIR sensor senses the signal for any moving available or not, if anything detect mean they send signal to the controller. IP camera and servo motor and connected in this system, it for monitoring and controlling of close and open the door. GSM has connected on this module , it can send the message to receiver, in case of any emergency or who can enter in the home, when is switches ON/OFF everything using GSM we can received the messages.

Temperature detection 21*c which detects the temperature of room and controls the fan

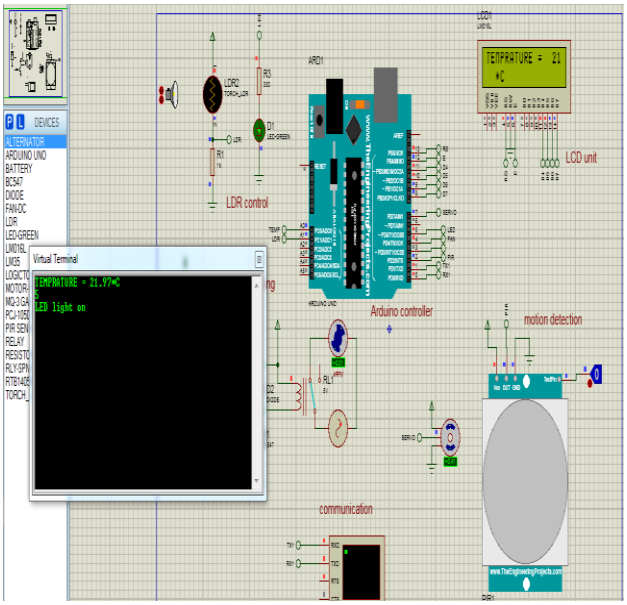

Fig 4: Temperature detection

Detection of the Intensity of light based on the sunlight using LDR sensor

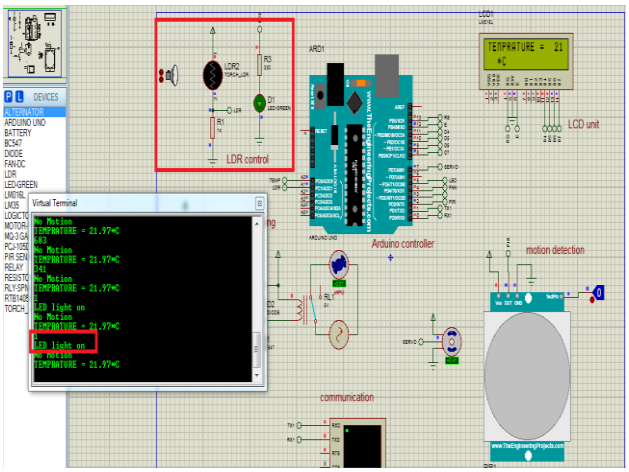

Fig 5: LDR sensor

Detection of temperature using LM35 sensor and based on which the fan rotates

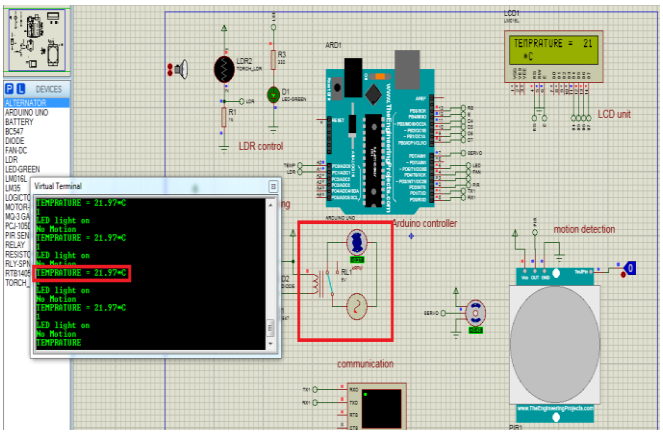

Fig 6: LM35 sensor

PIR sensor, which detects the people movement and sends the detection value to the user

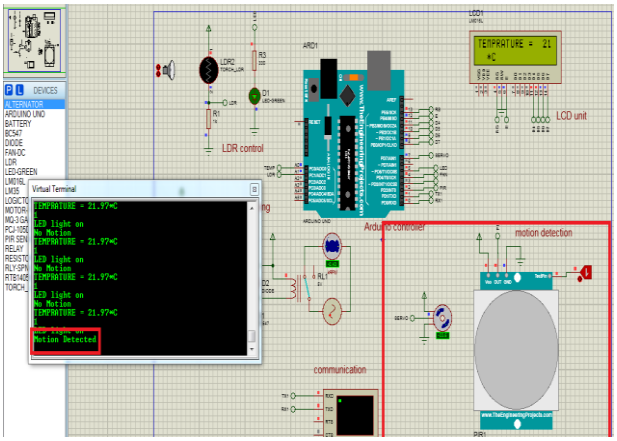

Fig 7: PIR sensor

Virtual Terminal which displays the result of the sensing devices

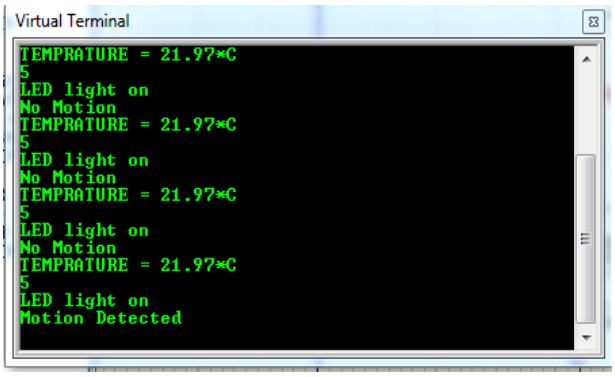

Fig 8: Virtual Terminal

Web applications:

Communication with physical things via the web additionally referred to as web of Things (IOT) [8, 14]. The web is nice supply of knowledge and communication within the gift age. Bland by name and externally viewed as gee-whiz experience ne'er to be completed, the IOT has vital potential to rework business. IOT may be a developing technology that permits various things and devices to be controlled via the web. IOT may be a wide travel scheme of everyday physical objects connected to the web, ready to distinguishing themselves and human activity information to alternative objects on the network [15]. The website is managed by the Arduino controller by passing information as codes. Arduino micro-controller acts as a shopper and also the PHP can act as a server as a result of PHP isn't a client based mostly programming language. The Wi-Fi protect connected with the Arduino board are going to be the link between the net.

3. EXPERIMENTAL RESULTS

The experimental results shows the working of the Arduino microcontroller with LCD unit, GSM and WiFi technology.

Arduino controller with home security system

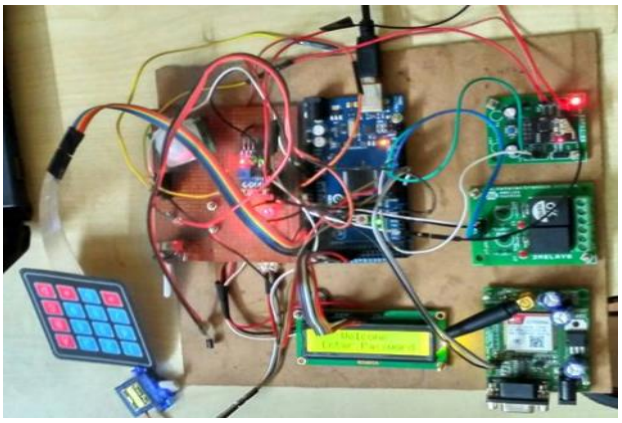

Fig 9: Arduino controller

LCD unit for password identification

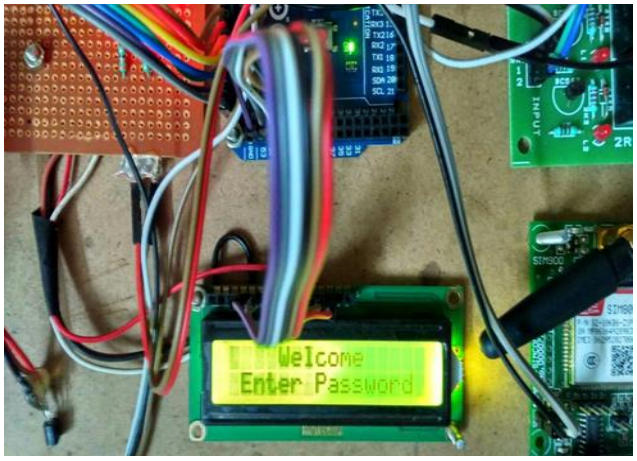

Fig 10: LCD unit

Keypad to enter the password

Fig 11: Keypad

Password is verified

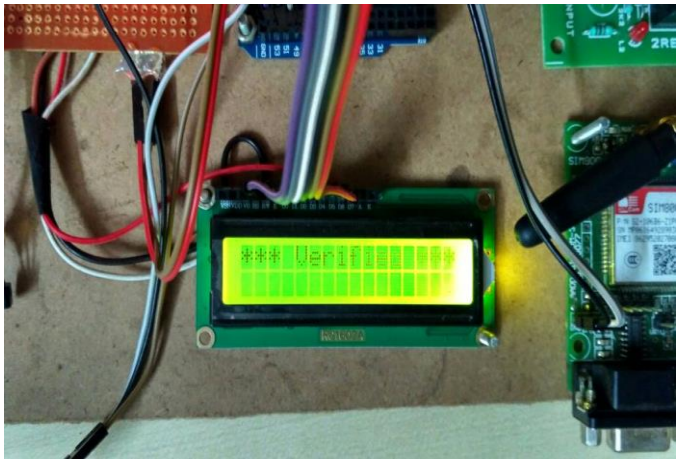

Fig 12: Password verification

Smart home security system is connected

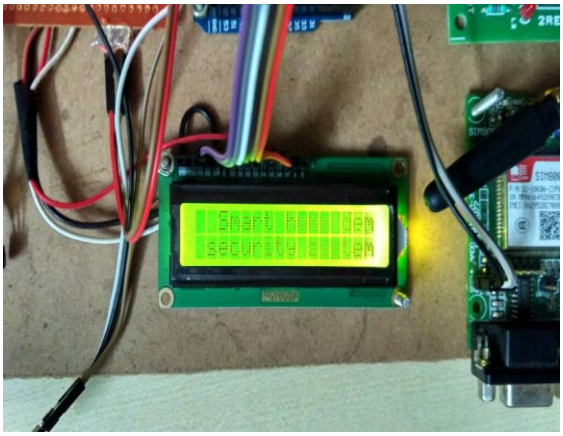

Fig 13: login into home security

SMS received to the registered mobile number

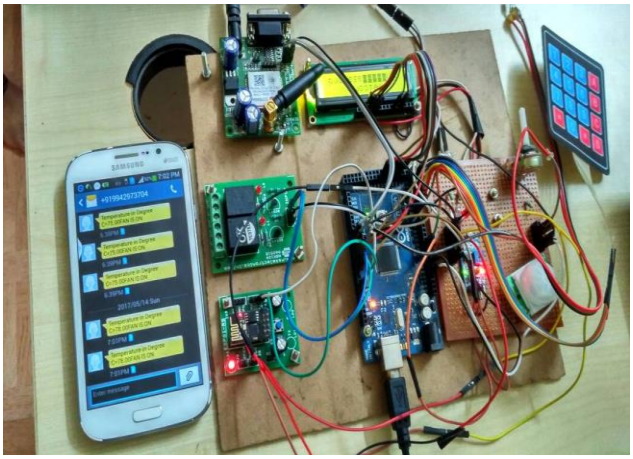

Fig 14: SMS to registered mobile

Temperature values displayed in the Arduino controller

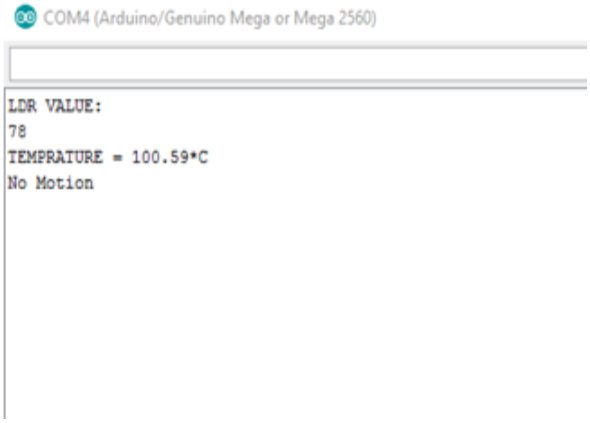

Fig15: Temperature values in Arduino

Temperature values displayed in the website

Fig 16: Temperature values in website

The values are exported in CSV format

	A	B	C	D
1	created_at	entry_id	field1	field2
2	2017-04-23 11:43:32	1	95.2	80
3	2017-04-23 11:44:01	2	95.1	80
4	2017-04-23 11:44:18	3	94.8	80
5	2017-04-23 11:44:45	4	94.9	80
6	2017-04-23 11:45:20	5	94.9	80
7	2017-04-23 11:45:37	6	95	80
8	2017-04-23 11:45:52	7	95.1	80
9	2017-04-23 11:46:17	8	94.8	80
10	2017-04-23 11:46:34	9	95.1	80
11	2017-04-23 11:46:51	10	95.1	80
12	2017-04-23 11:47:16	11	94.8	80
13	2017-04-23 11:47:34	12	94.8	80
14	2017-04-23 11:47:52	13	94.9	80
15	2017-04-23 11:48:07	14	95.1	80
16	2017-04-23 11:48:24	15	95	80
17	2017-04-23 11:48:42	16	94.9	80

Fig 17: Output in CSV

4. FUTURE WORK

The following purpose presents the elective future work for enforced prototype:

Additional intellectual ought to be additional to hardware modules to create them expert to require call in keeping with triggered alarms. While not touching on server for every event and action. which will increase the latency of the system. Whereas hardware interface module reports server with events and actions on pre-programmed intervals. Replace the Wi-Fi module with additional reliable and stable Wi-Fi module, to extend system dependability. Implements additional hardware interface modules, and modify server application computer code to handle them. Modify hardware interface module to be able to communicate with sensors and actuators that use wireless technologies.

5. CONCLUSION

A novel design for low price, safe, auto configurable and remotely controlled answer. The approach mentioned within the paper is novel and has achieved the target to regulate home appliances remotely victimization the Wi-Fi technology to connects system components, satisfying user wants and necessities. The projected design utilizes a small internet server associated Bluetooth communication as an practical application layer for communication between the remote user and also the home devices.

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