

Smart Home Automation for Differently Abled Person using Controller and IoT

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Abstract:- Widespread availability of the Internet, advancements in IoT-based applications have become the state-of-the-art technology among researchers. Web-based and Android-based technologies have grown in relevance in this cutting-edge technology to make the application more user-friendly.

This study proposes a smart energy-efficient home automation system that can access and control home equipment from anywhere on the planet. For this system, an Internet connectivity module is connected to the home system's main supply unit and may be accessed over the Internet. The static IP address is utilised for wireless communication.

Keywords: Smart Home, Automation, IoT, Artificial Intelligence

I. INTRODUCTION

The proposed Home Automation System complements mobility and helps tracking and control of gadgets from any far flung place inside Wi-Fi range. Being a easy and person pleasant utility it serves as an utility of great assist to the old aged or Differently abled peoples, where they aim to support autonomous living. Thus, the Internet of Things primarily based totally Home Automation System is higher than all conventional present Home Automation Systems. We can able to use everyday objects as our personal helpers and they will be incorporated in our homes in a non-intrusive way. With each sensors and gadgets drawing near loose and sizes drawing near invisible, we're approximately to go into the age of clever everything.

II. LITERATURE SURVEY

"Smart Home Intelligence"- (D. Bregman)

The research, supplied on this paper, is primarily based totally on a familiar implementation version for the clever

domestic. The "Home Intelligence" (HI) module of the clever domestic, gives critical added-cost to the shrewd conduct of the clever-domestic surroundings. The HI creates an incorporated surroundings wherein the Artificial Intelligence (AI) mechanism can infer and definitely react in keeping with converting situations and activities. By figuring out strange or surprising activities and, whilst important alerting the domestic's occupants, the AI module can offer a direct automated reaction if desired.

"Smart GSM Based Home Automation System"(R. Teymourzadeh, S. A. Ahmed, K. W. Chan, M. V. Hoong)

This studies paintings investigates the capability of 'Full Home Control', that's the goal of the Home Automation Systems in close to future. The evaluation and implementation of the house automation generation the use of Global System for Mobile Communication (GSM) modem to govern domestic home equipment including light, conditional machine, and safety machine thru Short Message Service (SMS) textual content messages is provided on this paper. The idea of serial conversation and AT-instructions has been implemented toward improvement of the clever GSM-primarily based totally domestic automation machine. Home proprietors may be capable of get hold of remarks fame of any domestic home equipment below manipulate whether or not switched on or off remotely from their cell phones. PIC16F887 microcontroller with the mixing of GSM gives the clever computerized residence machine with the favoured baud charge of 9600 bps.

"Development of RFID based automatic metro rail system."(Brumancia E, Hylish J, Karunya N)

The primary of this paper is to demonstrate the generation utilized in metro teach actions that are utilized in maximum of the evolved countries. This teach is geared up with a controller that allows the automated preventing of the teach from station to station. This paper offers the improvement

method of a prototype for a driverless teach carried out the use of a PIC microcontroller. Simulation for the system's circuits is achieved with the useful resource of Proteus software. The hardware circuits, that are constructed on revealed circuit boards (PCB), are interfaced with actuators and sensors for automation purposes. The hardware is assembled in a toy-like prototype teach.

“Mobile based home automation using Internet of Things (IoT)”(Kumar M, Ramu P, Murty CHAAS)

This paper discusses approximately IoT and the way it may be used for knowing clever domestic automation the use of a micro-controller primarily based totally Arduino board and Android cell app. In this paper, prototypes particularly domestic automation the use of Bluetooth in an indoor surroundings and domestic automation the use of Ethernet in an out of doors surroundings are presented.

“Implementation of voice control interface for smart home automation system in consumer electronics”(Suncica M, Sandra I, Tatjana E, Marija A, Nikola S)

In this paper, we put in force a voice command interface for clever domestic automation systems. The proposed interface defines command patterns, which may be without difficulty mapped to particular gadgets, tool functionalities and tool locations. Also, the manipulate of gadgets in a collection is supported. The proposed voice command interface is applied in manner that helps diverse voice popularity engines.

“Smart home reasoning systems”(Mekuria DN, Sernani P, Falconelli N, Dragoni AF)

This paper identifies approximately 43% of clever houses are designed to offer popular domestic automation services. It additionally gives twelve most important necessities of an SHRS. In addition, the take a look at reveals out that 55.5% of the studies contributions in SHRS area are conceptual and, 51.5% of them are primarily based totally on symbolic synthetic intelligence strategies. Further, it characterizes the utilization and alertness tendencies of various reasoning strategies in clever domestic area. Additionally, it discusses the demanding situations of reasoning in ambient assisted residing environments.

“Design and Implementation of a multifunction home automation system based on internet of things (IoT)”(Omar T, Abdulaziz A)

The advanced device offers scalability via way of means of assisting the addition of embedded nodes into the present bus-primarily based totally network, helps heterogeneity that permits distinctive kinds of nodes to interconnect wirelessly or via constant wires, and helps modularity that permits the device to alter itself and accommodate modifications with inside the surroundings as according to consumer preferences/configuration options.

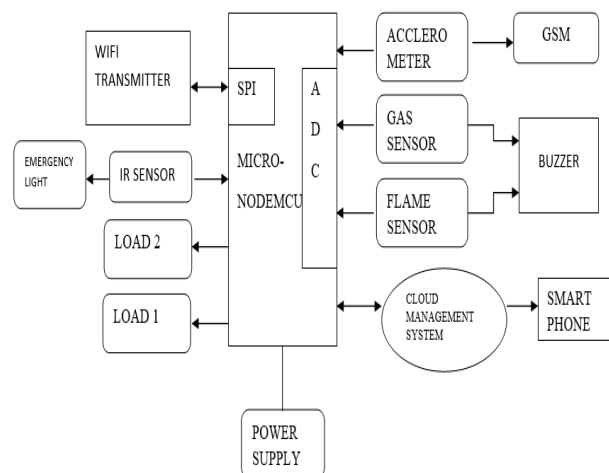
“Internet of things based multiple disease monitoring and health improvement system”(AbdulGhafar A, Mostafa SM, Alsaleh A, Sheltami T, Shakshuki EM)

The purpose of this paper is to advise an IoT primarily based totally machine for tracking more than one sickness the

usage of Cisco packet tracer tool. The gain this purpose, the machine is split into parts. The first element offers with records series and processing from sensors and microcontrollers. The 2nd element offers with supplied offerings which include disorder diagnosis, medicinal drug administration, and emergency responses. To reveal the feasibility of the proposed machine, 3 sicknesses are recall inclusive of hypertension, glaucoma, and persistent obstructive pulmonary disorder. It is likewise feasible to include different sicknesses.

III. RESEARCH METHODOLOGY

In this paper the designed model of home automation fulfils the unique demands of the increasing population of today's world. The peak advantage of our model is that the functionality of an array of electrical and electronic devices can be controlled with ease. Sometimes the busy life and traffic makes it difficult for us to be at work and to be at home at the same time. One of the features of our model makes it possible as it provides home system accessing remotely saving a lot of time. Another feature of our proposed model is that turning of lights and fans and other electronic and electrical devices remotely if they are not in use helping to manage the energy consumption of that home. To control these appliances remotely smart devices needs to be synchronized with the main server. The user may use the login id and password to change the status of any appliances saving time, energy and money. In addition to that our proposed model provides absolute security. If the user is not sure of weather closing the door or switching on the security alarm, the user may check the data on-line from the database present along with the main server and change the status accordingly. In there is any intruder the system automatically alerts the user with a message helping the user to take action as soon as possible. Altogether our home automation system provides 100% efficiency as it saves time, helps to manage energy consumption which in turn saves money and provide optimum security to the user making the user's home a safer and a smarter place to live in.



Home automation the use of MQTT is supplied for sending/receiving records from the sensor. For this ATMEGA328 is used as a gateway for getting access to the records from the sensor which person can manipulate their domestic equipment the use of the web-primarily based totally interface. In domestic automation the use of cellular is stated wherein gadget is designed the use of WiFi.

IoT has supplied the packages to show non-clever tool into clever tool, which permit customers to get entry to those gadgets via the Internet. It converts the house into clever domestic and presents a much better approach of controlling the house appliance. In Future, the safety may be introduced with the assist of set up digital with inside the domestic, which may be traced via the Internet. Thus, person can reveal their domestic and might flip ON/OFF their home equipment so one can absolutely going to shop each the energy and electric powered bills.

In addition to this automation, we added a IR sensor to monitor the room person count, if it counts any person crossing over a IR sensor, automatically load (i.e) fan or light will be ON, if the person exceeds a sensor load will gets OFF.

In our Project we added a Gas sensor, if the Gas sensor exceeds a value automatically buzzer will blow for an abnormal case.

Simultaneously, we added a Flame sensor to our project once fire catches or any bright illumination occurs automatically buzzer will get blown so that we can assume for abnormal issues.

Through GSM module the user can access to an emergence control where it can send warning message and alert to the contact number which are store in the GSM module

IV. COMPONENTS & TECHNOLOGY

In the consistently changing innovation drifts a couple of parts are being utilized trying to make a more effective, strong and easy to understand savvy home framework. The parts and advancements utilized for development of this brilliant home framework are

GAS SENSOR:



They are used in fueloline spillage identifying framework in own circle of family members and industry are suitable for distinguishing of LPG, iso-butane, propane, LNG, avoid the clamor of liquor and cooking vapor and tobacco smoke.

MAX 232:

The MAX232 is an integrated circuit first created in 1987 by Maxim Integrated Products that converts signals from a TIA-232 (RS-232) serial port to signals suitable for use in TTL-compatible digital logic circuits. The MAX232 is a dual transmitter / dual receiver that typically is used to convert the RX, TX, CTS, RTS signals.

The drivers provide TIA-232 voltage level outputs (about ± 7.5 volts) from a single 5-volt supply by on-chip charge pumps and external capacitors. This makes it useful for implementing TIA-232 in devices that otherwise do not need any other voltages.

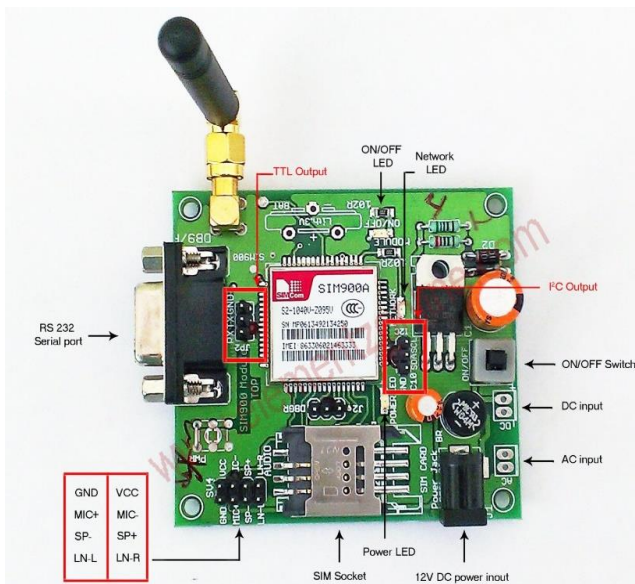
INFRARED SENSOR:



An infrared sensor is an digital device, that emits if you want to experience a few elements of the surroundings. An IR sensor can degree the warmth of an item in addition to detects the motion. That screen sign converted to virtual or analog sign ship to the microcontroller. The emitter is actually an IR LED (Light Emitting Diode) and the detector is actually an IR photodiode. Photodiode is touchy to IR mild of the equal wavelength that's emitted via way of means of the IR LED. When IR mild falls at the photodiode, the resistances and the output voltages will alternate in share to the value of the IR mild received. There are 5 simple factors utilized in a regular infrared detection system: an infrared source, a transmission medium, optical component, infrared detectors or receivers and sign processing. Infrared lasers and Infrared LED's of precise wavelength used as infrared sources. The 3 major varieties of media used for infrared transmission are vacuum, surroundings and optical fibers. Optical additives are used to cognizance the infrared radiation or to restriction the spectral response.

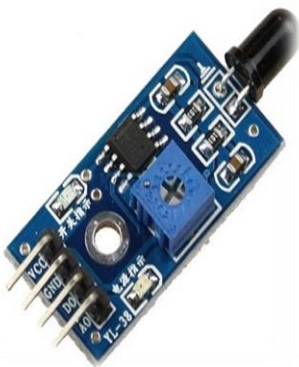
GSM Modem:

A GSM modem is a wi-fi modem that works with a GSM wi-fi network. A wi-fi modem behaves like a dial-up modem. The major distinction among them is that a dial-up modem sends and gets records via a set phone line even as a wi-fi modem sends and gets records via radio waves.



A GSM modem may be an outside tool or a PC Card / PCMCIA Card. Typically, an outside GSM modem is hooked up to a laptop thru a serial cable or a USB cable. A GSM modem withinside the shape of a PC Card / PCMCIA Card is designed to be used with a computer laptop. It must be inserted into one of the PC Card / PCMCIA Card slots of a computer laptop. Like a GSM cellular phone, a GSM modem calls for a SIM card from a wi-fi provider with the intention to operate. As cited in in advance sections of this SMS tutorial, computer systems use AT instructions to manipulate modems. Both GSM modems and dial-up modems assist a not unusualplace set of trendy AT instructions. You can use a GSM modem much like a dial-up modem. In addition to the same old AT instructions, GSM modems assist an prolonged set of AT instructions. These prolonged AT instructions are described withinside the GSM standards

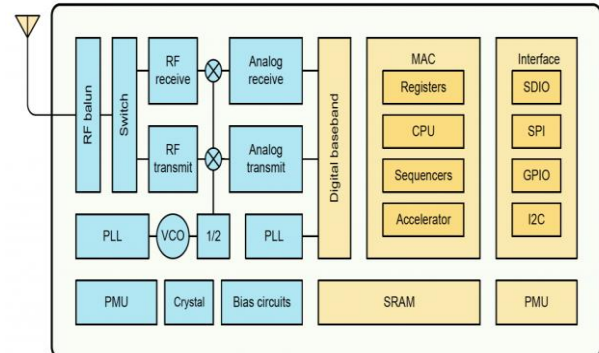
FLAME SENSOR:



A sensor that is maximum touchy to a ordinary mild is referred to as a flame sensor. That's why this sensor module is utilized in flame alarms. This sensor detects flame in any other case wavelength in the variety of 760 nm – 1100 nm from the mild source. This sensor may be without difficulty broken to excessive temperature. So, this sensor may be positioned at a sure distance from the flame. The flame

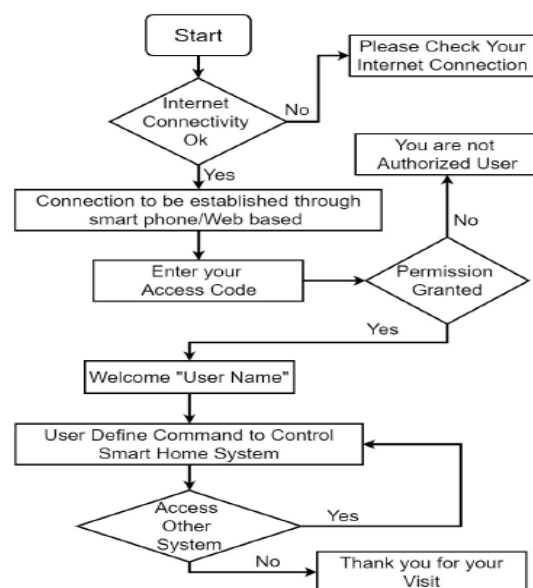
detection may be carried out from a 100cm distance and the detection attitude could be 600. The output of this sensor is an analog sign or virtual sign. These sensors are utilized in firefighting robots like as a flame alarm.

WIFI ARCHITECTURE:



Recently, I were doing a variety of paintings with the NodeMCU ESP8266-12E improvement board. As with preceding ESP board versions, locating properly documentation remains challenging. While the authentic ESP6266-01 module most effective had GPIO (preferred motive enter output) pins, this ultra-modern new release has many more. While the underlying Espressif chip has 17 GPIO, they're now no longer completely uncovered or to be had at the improvement board. And lots of them are shared or multiplexed with different improvement board features. This approach that they're now no longer to be had for application use, or most effective to be had sometimes. In fact, this board has 4 distinct purposeful modes Wi-Fi Key Features are 802.eleven b/g/n support, 802.eleven n support (2.four GHz) as much as 72.2 Mbps, Defragmentation, 2 x digital Wi-Fi interface, Automatic beacon monitoring (hardware TSF), Support Infrastructure BSS Station mode/SoftAP mode/Promiscuous mode.

FLOW CHART:

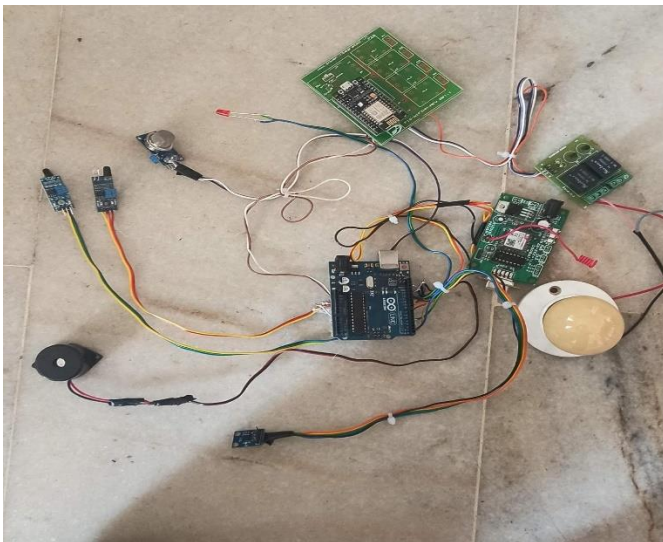


V. RESULTS AND DISCUSSION

It's a home automation device based on IOT by using controller "atmega328p", through this controller sensors like Fire detection, Gas Detection, IR Sensor were Connected. IR Sensor is used for Lights, Gas Detection sensor is used for detecting alarm and fire sensor is used for detecting fire. With the help of IOT Home appliances like Fans, Lights, etc.. were controller by Voice which would help for the differently abled peoples who can't control those with traditional way by using switches. Voice commanding done by using smartphone via Google assistant, Another important part of this work is with GSM Module, it is connected to Accelerometer and this module connected to controller atmega328p, by using accelerometer which functions based on 3 axis principle (x,y,z) at constant point it remains at 0, If any movements were detected then it will give output as 1. This principle of Accelerometer is used for monitoring differently abled peoples, if they fall unconscious or fell down using this accelerometer, the GSM Module will alter the attender or relative of the differently abled peoples through SMS.

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VI. CONCLUSION

The proposed Home Automation System complements mobility and supports monitoring and control of devices from any faraway place inside Wi-Fi range. Being a easy and person pleasant application it serves as an application of great assist to the old aged or Differently abled peoples, where they aim to support autonomous living. Thus, the Internet of Things primarily based totally Home Automation System is higher than all traditional existing Home Automation Systems. We will be able to use everyday objects as our personal helpers and they will be incorporated in our homes in a non-intrusive way. With both sensors and devices drawing near free and sizes drawing near invisible, we are about to enter the age of smart everything.