# WiFi Based Remotely Environment Monitoring System

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**ABSTRACT:** For most recent couple of years, difficulties of observing and control of distant environmental parameters precisely has developed as new field of research. The idea of Internet of Things (IoT) is additionally rising fastly where everything accompanies web availability for monitoring and control. Monitoring the environmental parameters with the help of internet is additional theory. This can be done by different modules as GSM model. The existing system contains the low level accuracy of Environment related information which will produce the wastage of cost low speed not follow any standard. The proposed system consists of the Wireless Sensor Network. This setup can also be used to measure the temperature of atmosphere using temperature sensor, humidity level using humidity sensor, Gas related information using IR sensor electrochemical sensor. This sensor array used for observing parameters in the range under supervision. Sensors Node has been intended to measure temperature, light, CO2, CO and humidity. The Control node has been intended to start the control activity. The Central Monitoring is based on raspberry pi board.

**KEYWORDS:** RASPBERRY PI, Humidity Sensor, temperature sensor, pressure sensor, light sensor, CO2 sensor, CO sensor.

## I.INTRODUCTION

One of the greatest issues that the arena is dealing with these days is that Environmental pollutants. It includes soil, water and air pollutants. The primary and main Environmental pollution is air pollution which causes global warming and weather trade. It additionally has an effect on human health. Environment monitoring is one of the essential software of wireless sensor community. It consist of various sensors which can be widely dispensed to display extraordinary environment parameters like temperature, humidity, gases, strain , wind pace and so on. This paper performs the review on different environmental air pollutants monitoring structures and strategies to improve the strength efficiency of the system. The new method for monitoring environmental parameters can be defined as a system for surveying some environmental parameters like temperature, humidity, pressure, and quantity of gasses like CO2, CO etc. Main advantages of this system are in industry, smart homes Greenhouse, weather forecasting in military purpose. This is advantageous for remote access to scaling data and it can be operate from long distance. The systems consist cluster of sensor for the sensing environmental parameters. Using raspberry pi is more beneficial over simple microcontroller. Raspberry pi has development board with Broadcom bcm2835 processor on it but microcontroller is just IC. Raspberry pi is along with many peripherals & so it is accessible to communicate the processor with the exterior world. Raspberry pi is having USB Ethernet port. The raspberry pi is open source technologies, i.e. communication web technologies. The main specification of raspberry pi board is it comprise SD card, Ethernet port. Also contains Linux OS, US keyboard, monitor, power supply and video cable. The Central processing unit is considered as main functional part of the raspberry pi board. It performs logical and mathematical operations. The GPU is a special chip on raspberry pi board and is used to speed up the operation for calculation of images. Ethernet port is required for communication with other devices .Home router is connected to access internet the Ethernet port is required.

## II.LITERATURE SURVEY

This paper offers the occasion of a cyber- bodily device that video display units the environmental situations or the close situations in indoor regions at remote locations. The communication among the system parts is created

victimization the existent wi-fi infrastructure. The resulted answer offers the chance of labor measurements from locations everywhere the planet and of visualizing and analyzing the accumulated data from any tool linked to the net. This painting encompasses the entire answer, a cyber-bodily gadget, ranging from the bodily degree, which include sensors and consequently the conversation protocol, and reaching information management and garage at the cyber level. It employs sensors mensuration the close or the ecosystem that send messages to partner degree IoT platform. The verbal exchange protocol and consequently the style of the nodes facilitate in accomplishing low strength intake, providing battery lifetimes of many years. The device removes massive solutions, offers the probability of labor facts wherever wireless network insurance exists, and can be employed in a huge vary of observance applications. [1]This section analysis several of the past works inside the below manner wireless detector networks (WSNs) have become a omnipresent generation resulting from the occasion of low rate and coffee energy wi-fi technology. In this, WSN technology might enable the identity and triangulation of car noise, permitting the supply of the noise to be decided. The environmental pollution observance device in 2008.The machine supported the IEEE 1451 normal. At some stage in this paper, various kinds of sensors as CO2, CO, NO2, O3 square degree connected with the help of microcontroller. For graphical instance it makes use of pc. Practical electrical tool interface module is connected to the laptop through electric device freelance interface that makes use of IEEE 1451 ordinary.[2]The developed pollution observance system victimization Geosensor community in2008.Geosensor network is hired to the sight the condition of far flung region. At some stage in this context model and idea of versatile sampling c language changed & introduced to boom the battery term. This may be designed to exercise session the contaminated rectangular measure as and alarm message and safety guidelines are ship to the parents on this space. [3]It implements practical detector community for various air great observances. Throughout in this system, detector nodes rectangular measure created in numerous rooms that is incorporates tin oxide sensors. This is related to hardwired or wirelessly to the significant unit. It is use to search out temperature and humidness. There square degree a couple of enter unmarried output neural networks use to scale back temperature and humidness influence on gasoline concentration. Wireless technology changed into used for verbal exchange. [4] In this paper it speak on environmental tracking machine. The evaluation discussed special techniques and diverse hardware used inside the surroundings tracking systems. The parameters like low fee, low electricity consumption, reliability, and sign to noise ratio and RF interference is give an explanation for in this. [5]

## III. PROPOSED METHODOLOGY

The proposed methodology of environmental monitoring system can be elaborated with the help of the system overview as mentioned in fig 1.
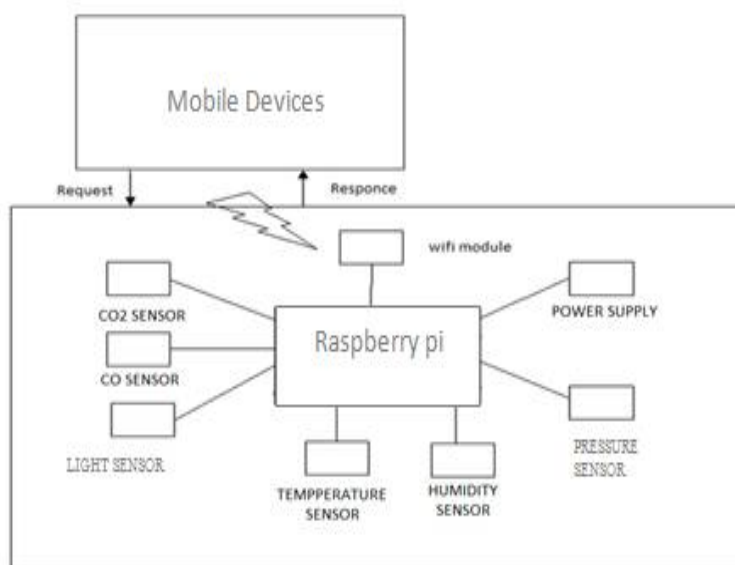


Fig 1- Block diagram of environmental monitoring    systems

First of all a Block diagram of the complete system is prepared. The each part of the block has been implemented step by step. Methodology for this research work can be detailed in the following steps.

Proposed Design

Fig.1 shows the block representation of the proposed Environment monitoring and control system. It has the following parts.

1. Central Monitoring System
2. Sensor and Control Nodes

Central Monitoring Unit (CMU) is connected to the internet. With the help of internet it can communicate other computer terminal or a mobile terminal which can be a smart phone or tabs. Sensors used for measuring temperature, pressure, humidity, light, CO, $CO_2$ can be measured with the help of sensors array. This sensor array is connected to ADC3208. The ADC is used to convert analog to digital data. The ADC is used because analog data is not understood by raspberry pi. So ADC is used. This digital data is given to raspberry pi then it is send to mobile. The sensor data is displayed on remote computer terminal and mobile terminal. The control command can be send from the remote computer terminal or mobile terminal. The system makes use very fast and accurate Google spreadsheet service to log the data online. The control action is initiated using the Google forms service. As the response is received it gives the command to the control node. Sensor node monitors all sensor values and sends it to control unit which then stores values in the Google spreadsheet. This spreadsheet can hold the data for long time and this can be used for analysis purpose. So Record of data is always available online.

Modules

1. RASPBERRY PI 3 BOARD

Raspberry Pi is also a credit-card-sized single board portable computer developed among the dominion by Raspberry Pi foundation with the intention of stimulating the teaching of basic technology in colleges. it's two models; Model A has twenty 56Mb RAM, one USB port and no network affiliation. Model B has 512Mb RAM, 2 USB ports Associate in Nursingd Associate in Nursing local area network port. Python is also used for machine arithmetic in addition as for the analysis of experimental data or management systems. Because of the distinctive blessings of the Raspberry Pi system, this technology holds nice promise for providing solutions at intervals the developing world.

2. Sensors

A light dependent resistor additionally realize as a LDR, image resistor, photoconductor or photocell, is a resistor whose resistance will increase or decreases depending on the amount of light intensity. LDRs could have a diffusion of resistance and capabilities. The LM35 is an included circuit sensor that can be utilized to quantify temperature with an electrical yield corresponding to the temperature (in oC). The LM35 creates a higher yield voltage than thermocouples and won't require that the yield voltage be intensified. This sensor is utilized to show encompassing temperature. The humidity sensor SY-HS 200 is used to measure humidity. The humidity sensor measures humidity in %RH.A pressure sensor is used to measure pressure & gas sensor is used for monitoring gas.

Step 1: This is the very first step of proposed system, where sensor of array is connected to the ADC3208.The requirement of ADC is that , it converts analog data sense by sensor is converted into digital data. This data is given to Raspberry pi.

Step 2: This data is passed to the data sheet as MySQL table. This output data of sensor is send to mobile .The scripting language used for this is html.

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## IV. RESULTS

To show the effectiveness of proposed system some experimental results are shown.
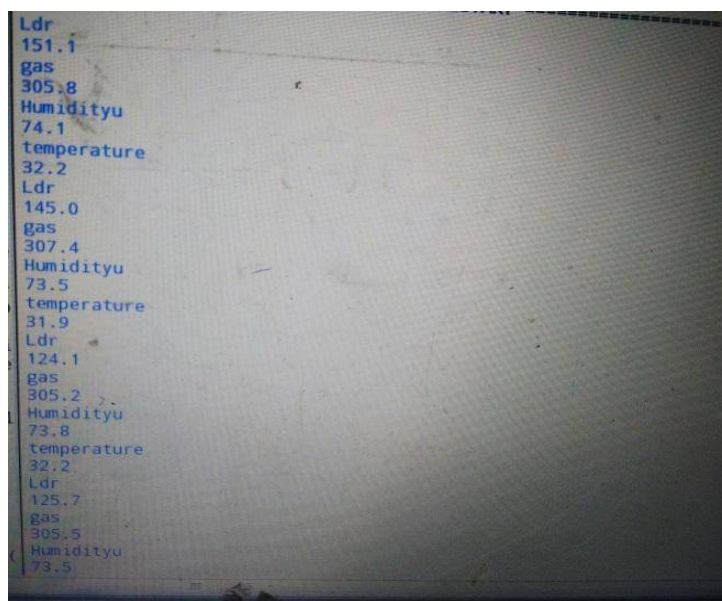


Fig 2-Experimental module



Fig 3- Output on Python window

| SR.NO. | PARAMETERS | EXPERIMENTAL RESULT |
|--------|------------|---------------------|
| 1. | Light Intensity | 151.1 |
| 2. | Temperature | $32.3^{o}C$ |
| 3. | Humidity | 73.5%RH |
| 4. | Pressure | 89.4pa |
| 5. | CO | 303.5ppm |
| 6. | $CO_2$ | 227.8ppm |

## V. CONCLUSION

In rising environmental parameters such as temperature, level of CO2 ,CO humans are responsible. Because of rising level of these parameters pollution level is increasing tremendously. With the help of this project we can control increasing level of these parameters. This is very different technology implemented useful to control environmental quantities.

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