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Environment Quality Monitoring System by Using Sensor Array

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Abstract: ***For most couple of years, recent difficulties of checking and control of far off natural parameters precisely has developed as new field of research. The idea of Internet of Things (IOT) is additionally growing speedy where everything around us goes with a web accessibility for observing and control. Monitoring the ecological parameters and starting a control activity from web is likewise some portion of this idea. In proposed work, design an environment monitoring system, fit for observing and control of environmental parameters like temperature, pressure and humidity. Also, focuses on design of a low cost system that is capable. Which is not just remotely observing the earth factors like temperature, Pressure and humidity additionally starts some control activity like exchanging devices ON/OFF from the web. Sensors hub has been intended to gauge the temperature, weight and mugginess.. The Control hub has been designed to initiate the control action. The Central Monitoring is depends on ARM11 raspberry pi board.***

Keywords: RASPBERRY PI, Humidity Sensor, moisturizer sensor, temperature sensor.

I. INTRODUCTION

Environment monitoring system is a system that is fit for measuring couple of environmental parameters like temperature, stickiness, and weight and so on. These parameters are imperative in numerous applications like in industry, brilliant homes Greenhouse and climate determining. Advanced Environment monitoring systems offer many features like remote access to the measurement data and furthermore can start some control activity from inaccessible area. These frameworks utilize Wireless sensor Networks for detecting the environment parameters. Wireless Sensor Network (WSN) has sensors to detect the physical parameters and they are interconnected wirelessly to trade information. They have a central monitoring system that is associated with the web to access the information remotely. A few sensors are equipped in each remote area to measure ecological parameters and these measurements are transfer to the focal office for capacity and analysis reason. Likewise, the focal office can offer charge to remote area for yield control execution. These elements offer an approach to keep up condition and permit acquiring alert on event of any abnormal conditions like parameters exceeding. A WSN permits organization of number of sensor hubs which design themselves depending on the system topology and neighborhood circumstance. After sensing their physical condiion and processing the acquired information locally, nodes communicate their information (or an extract) towards a network sink, where information is further handled and made accessible for readout. As transmitted information should find the best route towards its goal automatically, the network can be remotely controlled and along these lines be taken care of as one estimation handled as one large mapping instrument. Few systems also offer the remote logging facilities that are the parameters can be stored at regular intervals at the remote server so that they can be alluded whenever. The rapid development and miniaturization of sensor devices, and the recent advances in wireless communication and networking technologies, are permitting researchers and engineers to create networks of little sensors that can be utilized to continuously monitor the health and stability of the environment we live in. Wireless Sensor Networks (WSNs) comprise of various spatially distributed sensors with computing, handling and communication capabilities that can continuously detect and transmit information to a base station, where information can be processed and observed in real time. This paper provides a detailed study and implementation of a WSN for ongoing and continuous environmental monitoring of nursery gases. A tree-topology WSN comprising of two sensor nodes and a base station was successfully fabricated and tested using open source and inexpensive hardware to measure the concentration level of few nursery gasses.

II. LITERATURE REVIEW

Wireless sensor networks (WSNs) are turning into a universal innovation resulting from the development of low cost and low power wireless technology. WSNs are a group of spatially distributed detecting hubs with low maintenance requirements, which can automatically monitor environmental parameters and cooperatively transfer the data through a gateway to a main database using wireless networking. There are a multitude of applications for WSN ranging from environmental monitoring to health care. Civil engineering is one area in which WSNs are having a significant impact with the development of ‘smart infrastructure’.

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George Mois, Teodora Sanislav, and Silviu C. Folea, Member of IEEE Presented A Cyber-Physical System for Environmental Monitoring in 2016.

This paper exhibits the improvement of a digital physical framework that screens the natural conditions or the encompassing conditions in indoor spaces at remote areas. The came about arrangement gives the likelihood of logging estimations from areas everywhere throughout the world and of imagining and breaking down the assembled information from any gadget associated with the Internet. This work includes the entire arrangement, a digital physical framework, beginning from the physical level, comprising of sensors and the correspondence convention, and achieving information administration and capacity at the digital level. The exploratory outcomes demonstrate that the proposed framework speaks to a reasonable and clear answer for natural and encompassing checking applications.

Kadri et al. [8] in 2013 introduced ongoing time air contamination checking in view of Machine to machine correspondence.

The framework was actualised with different monitoring station which consist of different gaseous and meteorological sensors. Each observing station speak with backend server through M2M communication which uses GPRS network.

Anuj Kumar et 2013 conducted a review on environmental monitoring system. Survey talked about various method used in the environment monitoring systems. It likewise considered the parameters like minimal effort, low power utilization, unwavering quality and signal to noise ratio and RF interference.

II. DESIGN OF MONITORING SYSTEM

The proposed system consists of the Wireless Sensor Network for acquiring climate data locally. In WSN various Environment monitoring sensors are placed inside the field, sensors include temperature sensor, humidity sensor and moisturizer sensor. Using this information, Environment monitoring parameters calculated remotely at control system and display on the remote station android mobile wirelessly. This Unit consists of a Wi-Fi module, sensors, a microcontroller, and power sources. Several WSUs can be deployed in-field to monitor as a distributed sensor network for accurate Environment monitoring system. 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 . Each unit is based on the microcontroller RASPBERRY PI that controls the Wi-Fi module and processes information came from the all sensors.

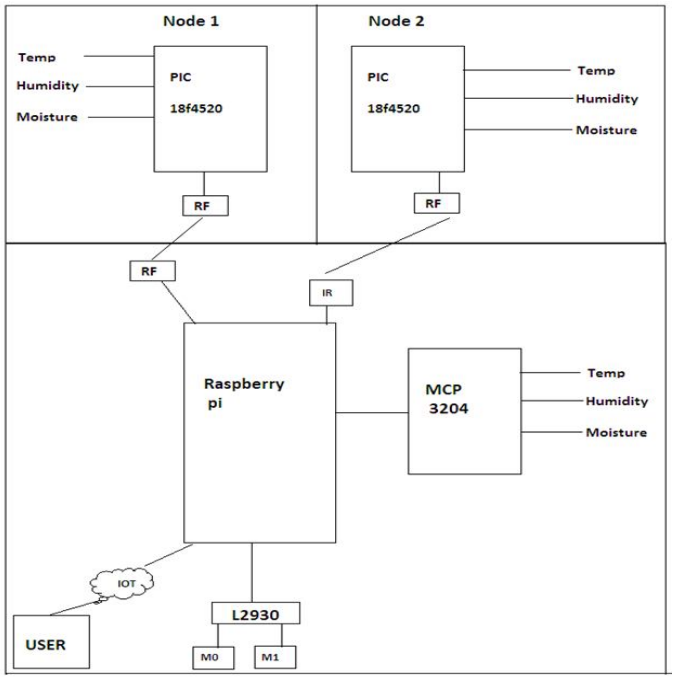

Fig.1- Block diagram of environment quality monitoring system by using sensor array

Here we design a system for environment monitoring. In this we monitor the temp, humidity, moisture using IOT. here we design two node which is sense the temp, humidity, moisture for that pic18f4520 controller is used , the both node connected to main server which is install in raspberry pi using Rf module . Both nodes communicate to server by RF link. All parameter is sense and send to Raspberry pi and raspberry by shows that parameter on web page. If any node fail for any reason then main server that fault is sense

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and display notification of failure on web page in that case the server moves to that location and replace that node by own that means all sensor is connected to server also and those parameter is show on web page at location of that node is fail. In this way we can easily monitor environmental parameter without any interruption. Here two motor are connected to server for moving the robot and also interface the IR sensor for detecting node location

A. Advantages

1) Maintain accuracy & efficiency by implementing the IEEE standard using wifi

2) This project can be used to save power

III. EXPERIMENTAL RESULTS

Here we plot graph of data for sensors. Here we consider time from 9 to 9:30, take reading for every 10 minutes and show on GUI. The physical parameters like Temperature, Moisture and Humidity measurement analysis given below. All physical data converted into digital format by python. Here we use 10 bits resolution ADC MCP 3204 and finally whole data will store in database for permanent records.

TABLE NO.1 PARAMETERS ANALYSIS

TIME	TEMP	Moisture	Humidity
9.00	28	25	200
9.10	26	28	230
9.20	29	30	190
9.30	30	32	199

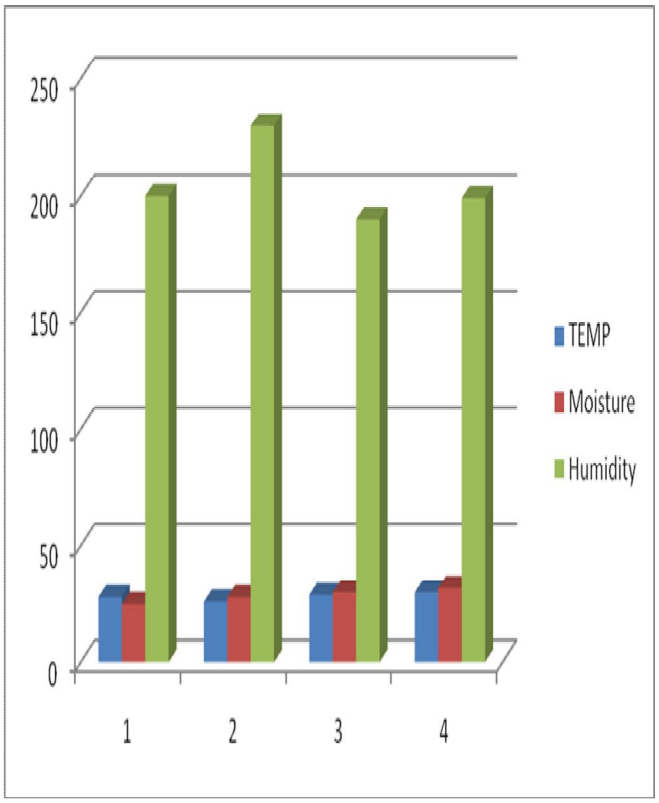

Fig 2: Performance benchmarking based on analysis.

V. CONCLUSION

Wireless Sensor Network is designed successfully and implemented for the purpose for which it has been designed. On observation of the performance it is concluded that the present system is reliable and variety of applications can be applied. Application parameters calculation and monitoring is precise and automatic even over the larger area. System can be monitor globally using uploaded data over internet. Parameters limit can be changed depending upon the environment

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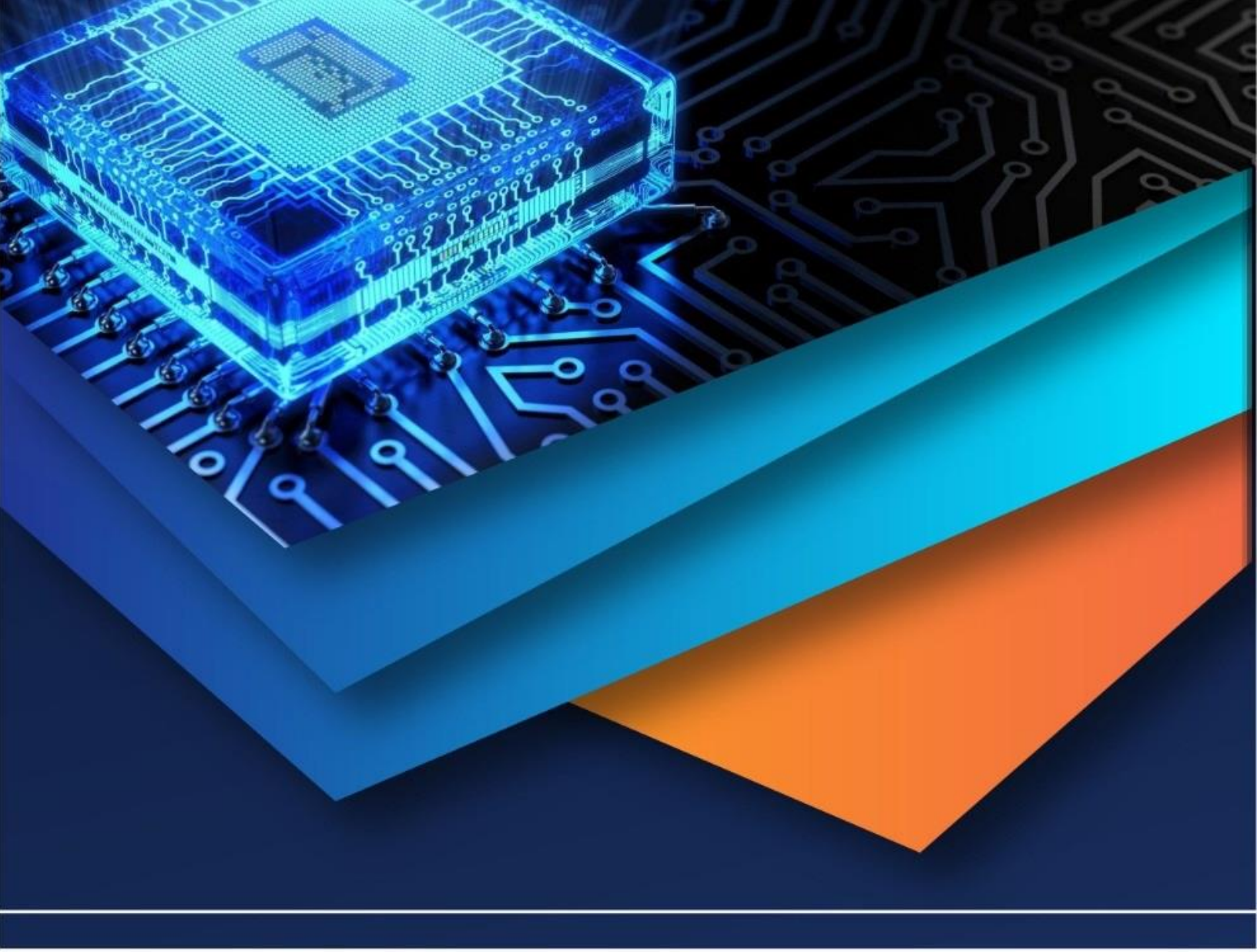

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