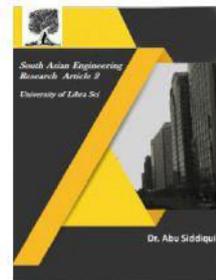




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IMPLEMENTATION OF GREEN HOUSE GASES AND HARMFUL GASES WIRELESS NETWORK MONITORING

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ABSTRACT: Environmental monitoring is a type of monitoring in which, monitor the quality of environment and we are measure the Environmental physical parameter and control the all environmental physical parameter according to environment required. All types of Environmental program are design and start according to current situation of Environmental physical parameter. India is very largest country in this world and many people depends on agriculture because India world 2nd largest agriculture activity done [1], but there are many problems are interrupt. Water is main issue for agriculture because weather is not supportive and all farmers are depends on natural water and rain water and it is not easily available due to global warming. In recent years, we are use 85% fossil fuel for energy resource and all country are depends on gas, oil, coal, wood. Due to uses of oil, gas and coal they cause many harmful effect on our health or environment and these effects are acid rain, ozone, global warming and smog [2]. Here we have discuss about the some scientific reason for air pollution due to greenhouse gases, thermal pollution and combustion of fossil fuel and its effect on our environment or human health.

Key Words: Global warming, green house effect, image processing, wireless sensor networks.

1. INTRODUCTION

A greenhouse gas is any gaseous compound in the atmosphere that is capable of absorbing infrared radiation, thereby trapping and holding heat in the atmosphere. By increasing the heat in the atmosphere, greenhouse gases are responsible for the greenhouse effect, which ultimately leads to global warming. Many of the world's largest cities today have bad air quality. To avoid such effects an efficient green house gases monitoring system is necessary. Wireless sensor networks (WSN) have been deployed for green house gases monitoring. The WSN is built of "nodes" – from a few to several hundreds or even thousands, where each node is connected to one (or sometimes several) sensors. Each such sensor network node has typically several parts: a radio transceiver with an internal antenna or connection to an external

antenna, a micro-controller, an electronic circuit for interfacing with the sensors and an energy source, usually a battery. We implemented the proposed green house gases monitoring system in different phases. The phases are sensors interfacing, Zig-bee network formation, web server creation, services on Internet.

2. RELATED WORK

Mallakalva Aneelkumar Reddy, et al [1] the paper titled as "On-line Monitoring of Green House gases Storage and Leakage Using Wireless Sensor Network" In this paper an effective observing of greenhouse gases is implemented by means of X-bee Digi modules and open source hardware platform Arduino, where each sensor nodes are equipped with Arduino microcontroller and Xbee Zig-bee series module and a battery source. The sensors detect the information and the gathered

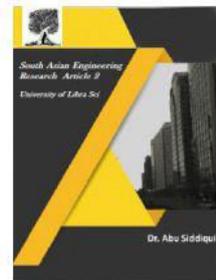


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data is sent to the central monitoring unit which acts as a sink node. Data are constantly transmitted from zig-bee sensor nodes to zig-bee coordinator node. This method can be used anywhere in the atmosphere and particularly useful in industries, hospitals etc. Web-server is formed using Ethernet shield which is used to make the complete system on-line. The detected information can be available to client anyplace on the planet using World Wide Web.

Rupesh G. Mundada et al [2] the paper titled as “Detection and Classification of Pests in Greenhouse Using Image Processing” This paper proposes a software prototype scheme for early pest recognition on the infected crops in greenhouse. Images of the infected leaf are caught by a camera with pan tilt and zoom and processed using image processing techniques to spot presence of pests. SVM classifier identifies the pests and in the classification of pest based on their structures. Results indicate more accuracy in recognizing the presence of pest at early stage.

M.Gao et al [3] the paper titled as “Environmental monitoring system with wireless mesh network based on Embedded System” This paper presents the environmental monitoring system with ARM9 S3C2410 microprocessor. The adaptable and self-sorting out wireless mesh network is utilized to accomplish the constant procurement and multi-hop wireless communication of parameters of the observing atmospheric environment, for example, SO₂, NO₂, NO, temperature, moisture etc. The whole monitoring system can be immediately arranged and quickly pulled back without backing of base station and has a solid selfhealing capability and network robustness and can be utilized for an assortment of infrequent atmospheric environmental monitoring.

Vincent Martin et al [4] the paper titled as “Early Pest Detection in Greenhouses”. The objective of this paper is the location of bio-aggressors on plant structures such as leaves. The objective of

this work is to characterize a creative choice emotionally supportive network, which handles multi camera information and takes after a nonexclusive way to deal with adjust to various classes of bio-aggressors. This methodology is non-damaging and non-intrusive. It will permit makers to take rapid remedial decisions. The major issue is to achieve an adequate level of power for consistent observation. To this end, vision algorithms (segmentation, classification and tracking) must be adjusted to adapt to brightening changes, plant developments, insect attributes. The primary model of our system is under test in a rose greenhouse outfitted with five wireless video cameras and this shows preliminary results for insect detection on sticky traps.

Anuj Kumar et al [5] the paper titled as “Indoor Environment Gas Monitoring System Based on the Digital Signal Processor”. The objective of this paper is to monitor indoor environment the sensor arrays have been developed, however, these systems are costly and have not gained wide acceptance. Precise monitoring of building environment has a vast potential in terms of energy savings. This system is utilized to overcome the problem of real time processing of carbon monoxide and carbon dioxide gases measurement using a DSP board (TMS320C6455) and then applying to the proposed gas monitoring system.

3. THE EFFECTS OF GREENHOUSE

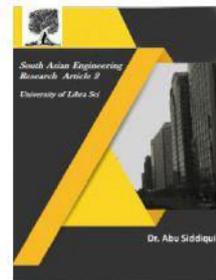
When glasses are allow the sun light or solar radiation entered into a car or house and blocks the all infrared radiation emitted by interior surface, due to this process temperature of interior is very high in greenhouse, home and car. This type of heating effect is called greenhouse effect [2].

3.1 The contribution of Gases in Green house effects on the Earth:

- carbon dioxide, 9–26%



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- water vapour, 36–70%
- ozone, 3–7%
- methane, 4–9%

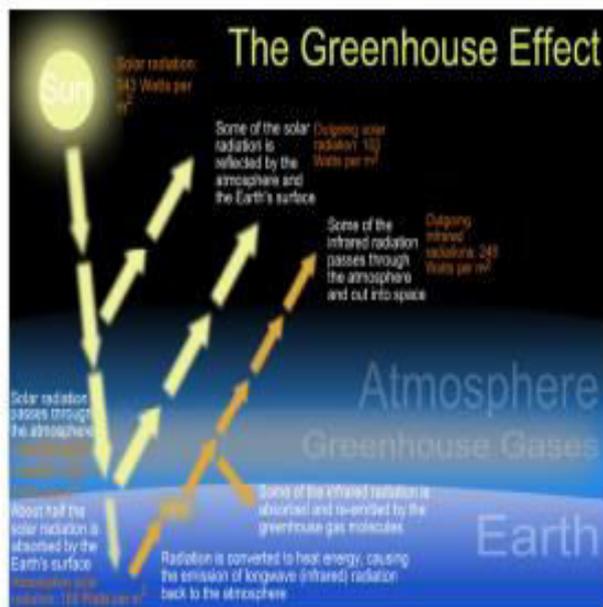


Figure:1 The Effects of Greenhouse

3.2 Effects of Greenhouse gases on our health and environment.

Carbon dioxide – Carbon dioxide (CO₂) gas is available in more amount on the earth atmosphere and it is totally waste, because it is very harmful gas for all. Carbon dioxide gas dissolves with ocean water and produce carbonic acid.

Carbon monoxide- The main source of carbon monoxide is motor vehicles in cities. In our environment, 90% of (CO) carbon monoxide are comes from motor fuels due to incomplete combustion of carbon. Carbon monoxide (CO) is decreases the level of oxygen gas in human body and effect the brain and muscles, due to this problem our body react very slow and react like a patient.

Hydrocarbon and Nitrogen oxides gas

The main source of nitrogen oxide are fossil fuels and the main source of hydrocarbon are refining the petroleum and transfer the petroleum.

When fuels are not combustion very well then it convert into hydrocarbon. Its effect on Ozone level and damage it. It is also effect on eye, plant,

fruit and asthma. It is very harmful gas for human people, because it causes cancer disease, heart disease and breathing diseases [2].

Ozone layer - Ozone are effects on environment and damage the human body like (skin problem, cancer, eye problem, damage the lungs, wheezing, breath shortness, headaches, fatigue, Asthma) its cause many type of diseases. Carbon monoxide (CO) is also a serious problem in smog pollutant, because carbon monoxide (CO) is very poisonous gas, colourless gas and order less gas [2].

3.3 Greenhouse Gas Monitoring

Greenhouse gas monitoring is the direct measurement of greenhouse gas emissions and levels. The monitoring and reporting of greenhouse gas emissions forms the basis for the evaluation, planning and monitoring of climate policy. Monitoring and reporting can be used to make sure that nations adhere to agree upon emission limits. The primary aim for the project is to assess monitoring techniques for geological storage of carbon dioxide (CO₂) Monitoring the effectiveness of geological storage of CO₂ is a challenging task because CO₂ is present naturally in the atmosphere. The Greenhouse gases such as CO₂, CO, Methane etc. are present in a Greenhouse. The Gas sensor (MQ-6) senses CO₂, Methane and the CO sensor (MQ-7) sense the CO content from the greenhouse.

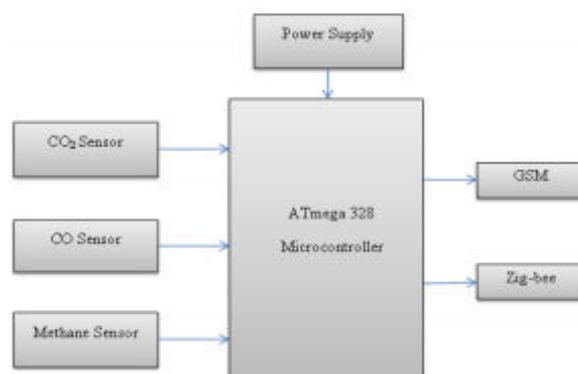
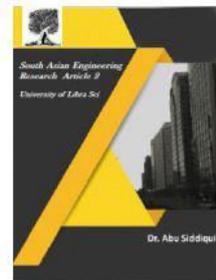


Fig-2: Block diagram of greenhouse gases monitoring



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3.4 WIRELESS REMOTE MONITORING SYSTEM DESIGN

Entire monitoring system to monitor the main station at the core, monitoring the main station there are three major tasks, namely by receiving remote terminal data; second is to send data to a central monitoring server; Third, when determining an emergency alarm information, via GSM module to send text messages to mobile phone users to bind to enable monitoring and timely decision-making and are able to deal with. Overall system shown in Figure 3.

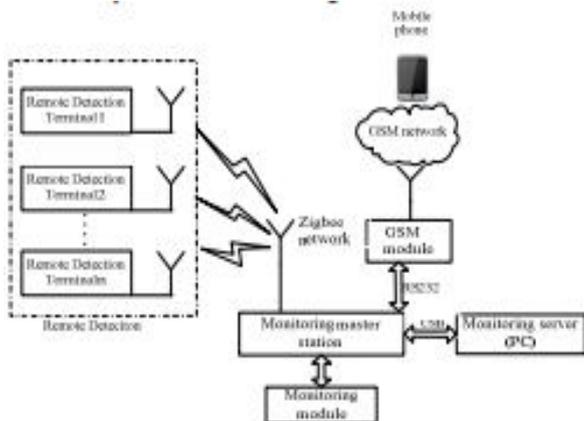


Figure 3. System structure

4. SYSTEM SOFTWARE DESIGN and SYSTEM TESTING

A. ZigBee monitoring master station

software design ZigBee monitoring master station's main functions are: formation of networks, the network address assigned to the nodes in the network [6]; receiving remote terminal data analysis and processing, real-time updates and display terminal data or status information when there is live data exceeds the alarm value when, through the GSM network to the mobile terminal; through the serial port to send data first bit machine monitoring software, as well as polling key tasks, the PC user commands. Program main flow chart shown in Figure 4.

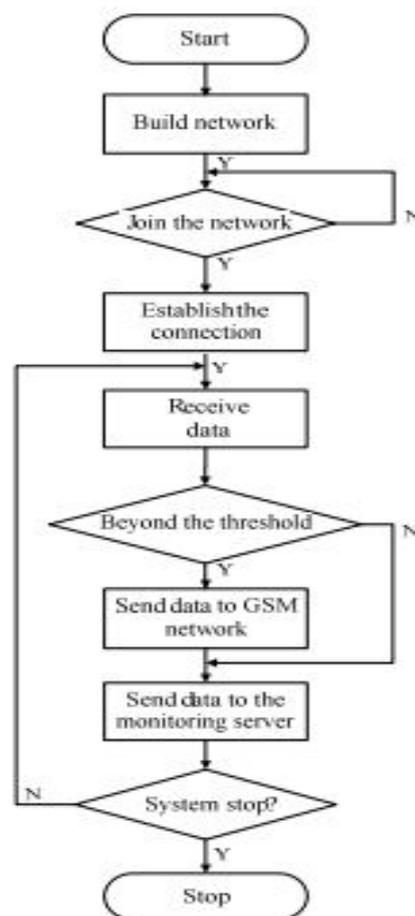


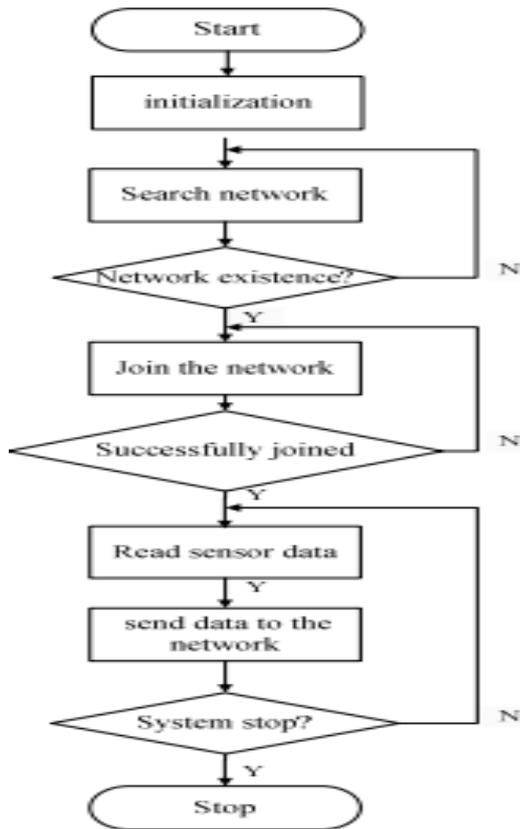
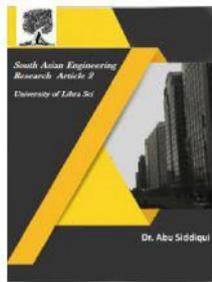
Figure 4. ZigBee master program flow monitoring

B. GSM Network Software Design

Wireless transmission network software design TC35i module MCU controls the wireless transceiver for short messages , including TC35i module initialization, receiving a control command, the program sends the message of three parts. Establish a communication module, generally with ATE instructions to complete this confirmation; then use the command AT + CMGF selected short message data format; After receiving the correct answers GSM module AT command to complete readout function. The design uses AT + CNMI = 2,1 SMS arrives automatically prompts, Extracting short message by a program stored in the position information in the SIM.



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SYSTEM TESTING

There is a monitoring system is mainly the main station, two remote terminal, a mobile phone and a stage mechanism into. One of the remote terminal and monitor the main station shown in Figure 4.1-4.2. Butane gas system as the detection target.



Figure4.1. Remote Terminal 1



Figure 4.2. Monitoring Master

Before testing the GSM module into a mobile SIM card and monitor through the serial port is connected to the main station. System testing real-time display sub-station gathering and temperature and humidity of the gas concentration curve shown in Figure 5.1-5.2.

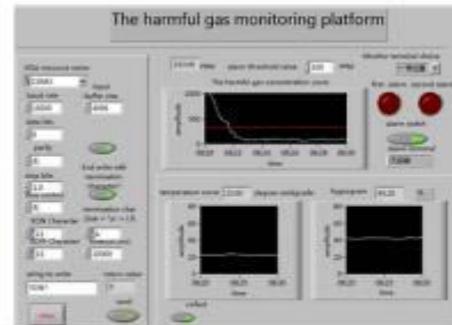


Figure 5.1. the 1st normal data curve

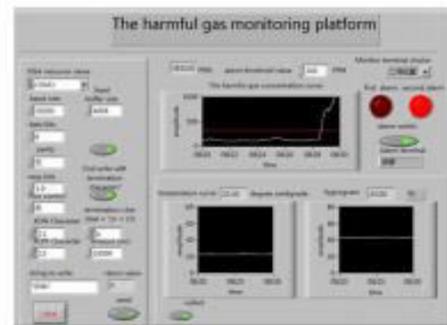


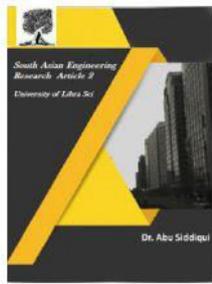
Figure 5.2. the 2nd alarm data curve

5. CONCLUSION

The results show that under the experimental conditions, ZigBee wireless sensor network can quickly network, receiving child node network, data transceiver, Interact with the user through the GSM network, and through the PC real-time display of temperature, humidity and gas concentration curves and alarm information.

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