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IOT BASED SAFETY AND POLLUTION CONTROL IN AUTOMOBILE

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Abstract—Now a days, many people are suffering from number of diseases which is only because of impure/unsafe drinking water. The traditional method of testing Temperature and humidity is to collect samples manually and then send them to laboratory for analysis. However, it has been unable to meet the demands of water quality monitoring today. Air and sound pollution is growing issue these days. It is necessary to monitor air quality for a better future and healthy living for all. We propose an air quality as well as sound pollution monitoring system that allows us to monitor and check air quality as well as sound pollution in particular area through IoT. In order to ensure the safe supply of the drinking water the quality needs to be monitor in real time. Here we design and develop a low cost system for real time monitoring of the water quality in IOT(internet of things).The system consist of several sensors used to measuring physical and chemical parameters of the water. The parameters such as temperature, PH, humidity sensor of the water can be measured.

I. INTRODUCTION

Pollution, also called environmental pollution, the addition of any substance (solid, liquid, or gas) or any form of energy(such as heat, sound, or radioactivity) to the environment at a rate faster than it can be dispersed, diluted, decomposed, recycled, or stored in some harmless form. Pollution is the introduction of contaminants into the natural environment that cause adverse change. Pollution can take the form of substances or energy, such as noise, heat or light. An Air contamination is a substance noticeable all around that can effectsly affectpeople and eco framework. The substance can be strong particles, fluid beads, or gases. A poison can be of common beginning or man- made. Toxins are named essential or optional. Air contamination developed in numerous parts of the world because of touchy modern development. Street transport is additionally one of the real supporters of air contamination which add to environmental change that has risky residential and worldwide results.Age and transport of contamination materials are represented by the dispersions of their sources

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as well as by the elements of the climate. Poison mists are in some cases watched going along the breeze headings. To comprehend the included procedures in more detail we require more careful information on the spreads of fine-grain contaminations and their varieties with time. An air contamination observing framework that is thorough regarding spatial and toxin scope and is moderately economical and self-ruling is the need.

II. LITERATURE SURVEY

A literature survey or a literature review in a project report is that section which shows the various analyses and research made in the field of your interest and the results already published, taking into account the various parameters of the project and the extent of the project. It is the most important part of your report as it gives you a direction in the area of your research.

Pandian D R **"Smart Device to monitor water quality to avoid pollution in IoT"** January 2015.

Internet of Things (IoT) is an integrated part of future internet and could be defined as a dynamic global network infrastructure with self-configuring capabilities based on standard and interoperable communication protocols where physical and virtual 'things' have identities, physical attributes and virtual personalities and use intelligent interfaces which are seamlessly integrated into the information network. In the IoT, 'things' are expected to become active

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participants in business, information and social processes where they are enabled to interact and communicate among themselves and with the environment by exchanging data and information 'sensed' about the environment, while reacting autonomously to the 'real/physical world' events and influencing it by running processes that trigger actions and create services with or without direct human intervention.Interfaces in the form of services facilitate interactions with these 'smart things' over the Internet, query and change their state and any information associated with them, taking into account security and privacy issues. The water quality monitoring is the essential need for the human life. There are huge numbers of diseases which cause through the polluted drinking water. The water will be polluted by the human being, animals, natural disasters and seasonal changes. So, people have to aware of their own locality water bodies conditions. To enable this, a prototype is proposed to monitor water quality in IoT environment.

Poonam Pal1, Ritik Gupta2, Sanjana Tiwari3,Ashutosh Sharma4 **"IOT Based Air Pollution Monitoring System Using NVDIA"** Oct -2017

The level of pollution has increased with times by lot of factors like the increase in population, increased vehicle use, industrialization and urbanization which results in harmful effects on human

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wellbeing by directly affecting health of population exposed to it. In order to monitor In this project we are going to make an IOT Based Air Pollution Monitoring System in which we will monitor thand will trigger a alarm when the air quality goes down beyond a certain level, means when there are sufficient amount of harmful gases are present in the air like CO2, smoke, alcohol, benzene and NH3.

Ms. Sarika Deshmukh Mr. Saurabh Surendran Prof M.P. Sardey **"Air and Sound Pollution Monitoring Systemusing IoT".**

As modernization is growing rapidly internet technologies and wireless sensor networks are advanced, a new trend in the era of omnipresence is being realized. The increase in the number of internet users and application on the internet working technologies enable networking of everyday objects requiring human-to-human or human-to-computer communication. Internet of Things allows an exchange of information to and from a device or thing. To design an IoT based Air and Sound pollution monitoring system which can be accessed with the help of Wi-Fi module and to analyse the pollution level of a particular place or site. To pick up the data from the atmosphere or contents of atmosphere various sensors are used .In this system air pollutants will be measured are carbon monoxide, carbon dioxide, cooking fumes, smoke and temperature.

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III. EXISTING SYSTEM

According to the survey, the below mentioned Air, Water, Soil and SoundPollution

Monitoring and NotificationSystems are Implemented as separatesystems. Air pollution monitoring and notification system: In the earlier years, the contamination levels because of various ventures and urbanization have been rising significantly, making it urgent to have a trusted and innovatively propelled method forestimating and observing probably the mostvital air components, including CO2, clean, and temperature, so as to have the capacity. portion of the present progress acts, forexample,

woodlands cutting,

expanded utilization of vehicles and other mechanicalacts imperil our wellbeing as well as the earth. Water pollution: monitoring and notification system: The framework can quantify the physiochemical parameters of water quality, for example, stream, temperature, pH, conductivity, and the oxidation lessening potential. These physiochemical parameters are utilized to identify water contaminants.

The sensors, which are planned from first standards and actualized with flag molding circuits, are associated with a microcontroller-based estimating hub, which Sound pollution monitoring and notification system:

The principle goal of IOT Air and Sound Monitoring System is that the Air andsound contamination is a developing issue

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nowadays. It is important to screen air quality and monitor it for a superior future and solid living for all. Here we propose an air quality and also solid contamination observing framework that enables us to screen and check live air quality and additionally stable contamination in a territory through IOT. Framework utilizes air sensors to detect nearness of destructive gases/mixes noticeable all around and always transmit this information.

IV. PROPOSED SYSTEM

Proposing the combination of Air, Water, Soil,Sound pollution monitoring and notification systems and making into a single system using IoT.Detection of harmful gases such as CO, Smoke, LPG etc. using gas leakage sensors. Detection of soil moisture level using soil sensor. Detection of pollutants in water using various sensors such as ph, temperature and turbidity. Usage of GSM to get the parametersvalues as a message to the mobile phone when it crossed some limit and continuous monitoring of the parameters values using app and if it crossed some amount of limit some authority people will the notification messagewith google location.

V. REQUIRMENTS SPECIFICATION

Requirements specification refers to specific design requirement. It's the process of writing down the user and system requirements into a document. The requirements should be clear, easy to understand, complete and consistent NVDIA: The NVDIA is a microcontroller board based on the ATmega328 (datasheet). It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz crystal oscillator, a USB connection, a power jack, an ICSP header, and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started. The Uno differs from all preceding boards in that it does not use the FTDI USB-to-serial driver chip. Instead, it features the Atmega8U2 programmed as a USB-to-serial converter. "Uno" means one in Italian and is named to mark the upcoming release of NVDIA 1.0. The Uno and version1.0 will be the reference versions of NVDIA, moving forward. The Uno is the latest in a series of USB NVDIA boards, and the reference model for the NVDIA platform; for a comparison with previous versions, see the index of NVDIA boards.

Features of NVDIA:

- Microcontroller: ATmega328.
- Operating Voltage: 5V.
- Input Voltage (recommended): 7-12V.
- Input Voltage (limits): 6-20V.
- Digital I/O Pins: 14 (of which 6 provide PWM output)
- Analog Input Pins: 6.
- DC Current per I/O Pin: 40 mA.
- DC Current for 3.3V Pin: 50 mA

Basic Functions of NVDIA Technology:

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- Digital read pin reads the digital value ofthe given pin.

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- Digital write pin is used to write the digital value of the given pin.
- Pin mode pin is used to set the pin to I/O mode.
- Analog read pin reads and returns the value.
- Analog write pin writes the value of the pin NVDIA

NVDIA

GSM SIM 900A :

GSM/GPRS Modem-RS232 is built with Dual Band GSM/GPRS engine SIM900A, works on frequencies 900/ 1800 MHz . The Modem is coming with RS232 interface, which allows you connect PC as well as microcontroller with RS232 Chip(MAX232). The baud rate is configurable from 9600-115200 through AT command. The GSM/GPRS Modem is having internal TCP/IP stack to enable you to connect with internet via GPRS. It is suitable for SMS, Voice as well as data transfer application in M2M interface. The onboard Regulated Power supply allows you to connect wide range unregulated power supply . Using this modem, you can make audio calls, SMS, Read SMS, attend the incoming calls and internet through simple AT commands.

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GSM SIM 900A

DHT11 - Humidity and Temperature Sensor: The DHT11 is a basic, low-cost digitaltemperature and humidity sensor. It uses acapacitive humidity sensor and thermistor tomeasure the surrounding air, and spits out adigital signal on the data pin (no analog inputpins needed).Its fairly simple to use, requirescareful timing to grab data. The only realdownside of this sensor is you can only getnew data from it once every 2 seconds.

DHT
11

MQ-2 gas sensor:

Sensitive material of MQ-2 gas sensor is SnO2, which with lower conductivity in cleanair. When the target combustible gas exist, the sensor's conductivity is higher along with the gas concentration rising. Please use simple electro circuit, Convert change of conductivity to correspond output signal of gas concentration.MQ-2 gas sensor has high sensitivity to LPG, Propane and Hydrogen, also could be used to Methane and other

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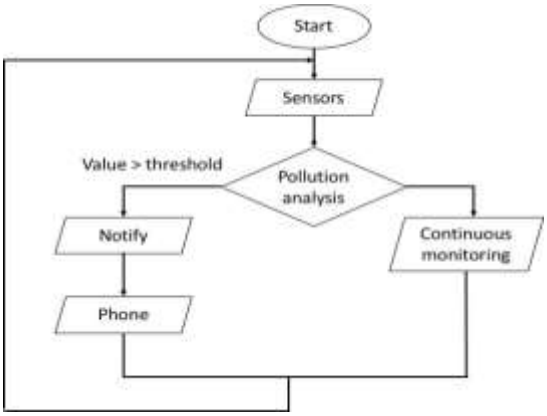
combustible steam, it is with low cost and suitable for different application.

GAS SENSOR

SOUND SENSOR: The sound sensor module provides an easy way to detect sound and is generally used for detecting sound intensity. This module can be used for security, switch, and monitoring applications. Its accuracy can be easily adjusted for the convenience of usage. It uses a microphone which supplies the input to an amplifier, peak detector and buffer. When the sensor detects a sound, it processes an output signal voltage which is sent to a microcontroller then performs necessary processing.

SOUND SENSOR

ACTIVITY DIAGRAM.



BLUETOOTH DEVICE:

For the communication between mobile phone and microcontroller Bluetooth module (HC-05) is used. HC-05 is low power 1.8V operation and is easy to use with Bluetooth SPP (serial port protocol).Serial port Bluetooth module have a Bluetooth 2.0+EDR (enhanced data rate), 3Mbps modulation with complete 2.4GHZ radio transceiver and baseband. Using Bluetooth profile and android platform architecture different type of Bluetooth applications can be developed.

BLUETOOTH DEVICE

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VI. DESIGN &ANALYSIS

Design is the creation of a plan or convention for the construction of an object, system or measurable human interaction (as in architectural blueprints,engineering drawings, business processes, circuit diagrams, and sewing patterns). In some cases, the direct construction of an object (as in engineering, management, coding, and graphic design) is also considered to use design thinking. The project analysis provides critical data support to a technical team. Analysis functions may include budget tracking and financial forecasting, project evaluation and monitoring, maintaining compliance with corporate and public regulations, and performing any data analysis relevant to project tasks.System Architecture:The proposed air, water, soil and sound monitoring is based on the below block diagram. The data from temperature and humidity sensor, ph sensor, soil sensor, gas sensor, sound sensor is acquired. After the data is obtained, the first stage is completed.Next the pre-processing stage comes in with the NVDIA processes the information received from the sensor.

VII. IMPLEMENTATION:

Implementation is the process of putting a decision or plan into effect or execution. Ii is a realization of a technical specification or algorithm as a program, software component, or other computer

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system through computer programming and deployment. NVDIA board designs use a variety of microprocessors and controllers. The boards are equipped with sets of digital and analog input/output(I/O) pins that may be interfaced to various expansion boards or Breadboards (*shields*)and other circuits. The boards feature serial communications interfaces, including Universal Serial Bus (USB) on some models, which are also used forloading programs from personal computers. The microcontrollers are typically programmed using a dialect of featuresfrom the programming languages C and C++. In addition to using traditional compiler toolchains, the NVDIA project provides an integrated development environment(IDE) based on the Processing language project.

VIII. TESTING

Testing- Testing is a key step. Testing can be defined as checking for correct behaviour prior to release to end users. It is process of testing software for defects

UNIT TESTING: Unit Testing is a level of software testing where individual units/ components of a software are tested. The purpose is to validate that each unit of the software performs as designed. A unit is the smallest testable part of any software.

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INTEGRATION TESTING: integration testing is a level of software testing where individual units are combined and tested as a group. The purpose of this level of testing is to expose faults in the interaction between integrated units. Test drivers and test stubs are used to assist in Integration Testing. This stage is carried out in two modes, as a complete package or as an increment to the earlier package. Most of the time black box testing technique is used. However, sometimes a combination of Black and White box testing is also used in this stage.

SYSTEM TESTING: System testing is a level of software testing where a complete and integrated software is tested. The purpose of this test is to evaluate the system's compliance with the specified requirements. .In this stage the software is tested from all possible dimensions for all intended purposes and platforms. In this stage Black box testing technique is normally used. System testing of software or hardware is testing conducted on a complete, integrated system to evaluate the system's compliance with its specified requirements. System testing falls within the scope of black-box testing, and as such, should require no knowledge of the inner design of the code or logic.

IX. RESULT

Screenshot of message if it crosses the limit.

screenshot of message with location when there is high sound.

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Message with Location when Temperature crosses limited.

X. CONCLUSION AND FUTURE ENCHANCEMENT

The system to monitor various parameters of environment using NVDIA microcontroller, WSN and GSM Technology is proposed to improve quality of air. With the use of technologies like WSN and GSM enhances the process of monitoring various aspects of environment such as air quality monitoring issue proposed in this paper. The detection and monitoring of dangerous gases is taken into account in a serious manner and related precautions have been considered here in the form of an alert message and a buzzer so that the necessary action may be taken.

Limitations:

- Reduce overall cost of the monitoring system
- Reduce time required for generating monitoring system
- Reduce size of the monitoring system
- Reduce components of the monitoring system
- As sensors are very sensitive they must be handled carefully

Future Enhancements:

- Accuracy of the system values depends mainly on the sensors used.

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In future the project can be upgraded in more waysthan one.

- Interface more number of sensors to know detail content of all type of pollution in environment
- Design webpage and upload data on webpagewith date and time.
- Interface SD card to store data.
- Interface GPS module to monitor thepollution at exact location.

XI. REFERANCE

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