ENVIRONMENT DOCTOR SYSTEM

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Abstract - The degradation of water resources , soil and air pollution has become a common problem. It is necessary to monitor air quality and water quality and keep it under control for a better future and healthy living for all. System uses air sensors to sense presence of harmful gases/compounds in the air and constantly transmit this data to microcontroller. System keeps measuring the parameters of water, such as temperature PH value, turbidity, flow and reports it to the online server over IOT. Also, System also measures the parameters like Soil Moisture , pH, Temperature and Humidity . This system collects data about the air , water and soil quality and determines its purity. It will send us the data about quality from a wireless network. This data will be received by a machine and it will send this data to the server. Next, the data on the server can be displayed to various clients.

1.INTRODUCTION

Our planet breathes with the rhythm of its air, water, and soil. Yet, this intricate dance has been thrown off balance by the unrelenting march of pollution. Contaminated air hangs heavy, rivers run dark, and once fertile ground crumbles under the weight of neglect. It's a grim picture, threatening our very existence. But even in the face of such adversity, hope persists. For where there's a struggle, there's a spark of innovation, a flicker of resilience that refuses to be extinguished. This project embodies that very spirit. It reaches out not with despair, but with a bold vision for a future where clean air whispers through leaves, crystal clear water nourishes life, and healthy soil cradles thriving ecosystems. It proposes a system - a vigilant sentinel - that constantly watches over the health of our environment, monitoring the air we breathe, the water we drink, and the earth that sustains us. Through a network of air sensors, it scans for invisible threats, sniffing out harmful gases and compounds that infiltrate our very lungs.

2. LITERATURE SURVEY

[1]: Participatory Air Quality and Urban Heat Islands Monitoring System

The explanation of the Air Quality Index (AQI) and its standard ranges are described in . From 0-100 ppm the atmosphere is safe for living. If the ppm level increases above 100 then it moves out of the safety zone. If the ppm value rises above 200 then it becomes extremely dangerous for human life. The DHT11 sensor module is used to measure the temperature and the humidity of the surroundings

[2]: Long Term Forecasting Of Ambient Air Quality Using Deep Learning Approach.

The MQ-135 gas sensor is used to measure the air quality of the surroundings . It can be calibrated with respect to fresh air, alcohol, carbon dioxide, hydrogen and methane. In this project, it has been calibrated with respect to fresh air .

[3]: Water Quality Monitoring for Rural Areas-A Sensor Cloud Based Economical Project.

This paper highlights the entire water quality monitoring methods, sensors, embedded design, and information dissipation procedure, role of government, network operator and villagers in ensuring proper information dissipation.

[4]: Real Time Water Quality Monitoring System

This paper describes to ensure the safe supply of drinking water the quality should be monitored in real time for that purpose new approach IOT (Internet of Things) based water quality monitoring has been proposed. In this paper, we present the design of IOT based water quality monitoring system that monitor the quality of water in real time.

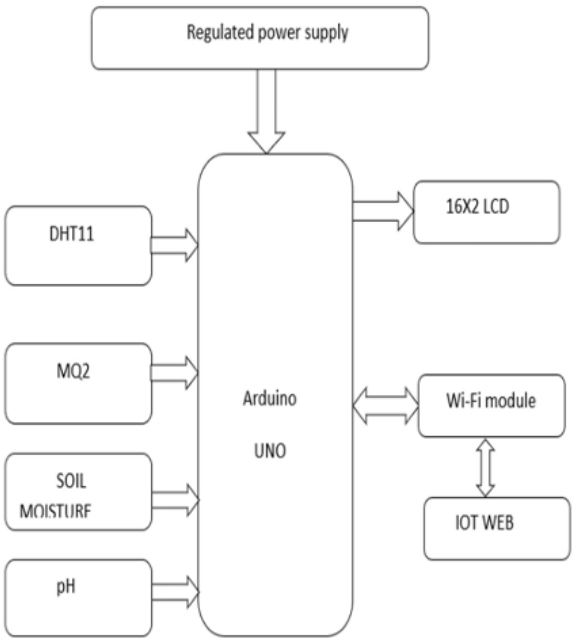
[5]: Design of an IoT Based Soil Monitoring System

This paper describes The IoT plant monitoring system integrates various sensors to monitor and control plant conditions. Gas emissions during day and night are tracked on the IoT cloud, while soil moisture levels determine the operation of a water pump through a controller.

3. PROPOSED SYSTEM

The proposed air quality monitoring is based on the block diagram as shown in Fig. the data in air is acquired by CO2 sensor, CO sensor, soil moisture sensor and temperature and humidity sensor. After the data acquisition stage, the preprocessing stage comes in which the Arduino processes the information received from the sensors and changes it into more viable form to be accessed at the base station and by the user. Wi-Fi module acts as a gateway for the communication between Arduino and the IoT.

4. SYSTEM ARCHITECTURE

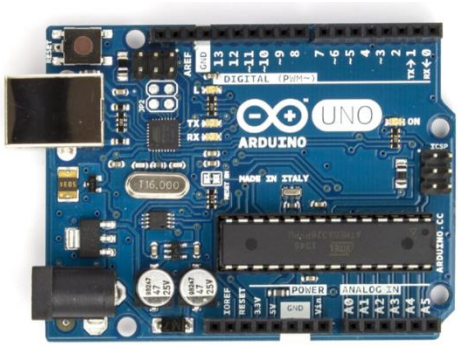


System Architecture

5. DESCRPTION OF COMPONENTS

- **Arduino**

  The Arduino Uno 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 ceramic resonator, 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.



- **LCD (Liquid Crystal Display):**

  Liquid Crystal Display also called as LCD is very helpful in providing user interface.

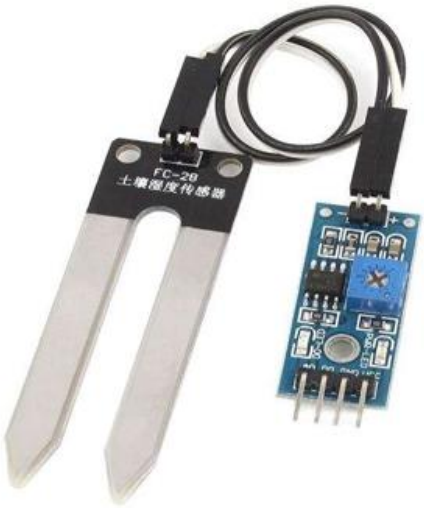
LCD

- **Air Quality Sensor**

  The MQ-2 gas sensor senses the gases like ammonia nitrogen, oxygen, alcohols, aromatic compounds, sulfide and smoke. The operating voltage of this gas sensor is from 2.5V to 5.0V.

- **Soil Sensor (FC-28)**

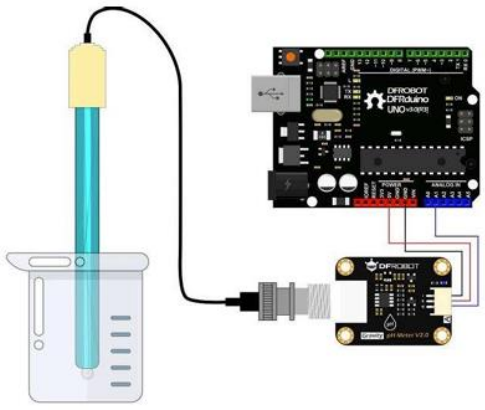
  The FC-28 Soil Moisture Sensor gauges soil moisture levels through a probe, aiding in precise irrigation for optimal plant growth. Its affordable and straightforward design makes it popular in agriculture and gardening.



FC-28

- **Water Quality Sensor**

  The Water Quality Sensors are electronic devices designed to measure and monitor various parameters indicative of water quality. These sensors typically include probes that can assess factors such as pH levels, electrical conductivity, temperature, and turbidity in water. SEN0161 is known for its pH sensing capabilities.



SENO

6. WORKING

The general working process of our proposed system:

- Sensor Data Collection:

  Various sensors, such as those for CO2, benzene, smoke, alcohol, LPG, temperature, and humidity, continuously monitor the surrounding environment.

- Data Transmission:

  The sensor data is transmitted to an Arduino Uno, which acts as the central processing unit for the system.

- IoT Communication:

  The Arduino, connected to the internet through IoT technology, uploads the processed data to a designated web server.

- Web Server Interaction:

  The web server stores and manages the received data, creating a database of air quality metrics over time. Authorities and users can access this information through a web interface, enabling them to monitor air quality in different locations.

- Alerts and Analysis:

  The system can be programmed to generate alerts or notifications when pollutant levels exceed predefined thresholds, facilitating immediate action. Historical data stored on the server allows for trend analysis and long term assessment of air quality in specific areas.

7. CONCLUSION

The "Environment Doctor System" stands as an indispensable innovation, serving as a vigilant guardian of our ecosystem. With its real-time environmental monitoring capabilities and proactive measures, this system not only diagnoses the health of our surroundings but also provides timely interventions to address emerging issues. In a world grappling with escalating environmental challenges, this comprehensive solution embodies a crucial step towards a sustainable future, where the delicate balance of nature is preserved through informed decision-making and collective efforts to heal our planet.

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