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Artificial Intelligence Based Smart Tree for Metropoliton Cities to Increase Air Purity

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ABSTRACT: The main objective of this system is to purify the air in metropolitan cities .Industrial process gases contain dust particles. Electrostatic precipitator is a device used nowadays to collect dust particles. A precipitator affected by various factors and it is larger in size. So we are implementing new method of air purification system. System contains solar energy which provides entire power to the system. We can able to monitor the atmospheric smoke level and temperature by using sensors. If smoke becomes abnormal then entire purification system will be activated by microcontroller and it will be automatically updated to the IOT server. The purification system contains heater that removes unwanted gases in the air and purified air comes out by the exhaust fan.

KEYWORDS: Artificial Intelligence, Air purifier, IOT.

I. INTRODUCTION

In Over the past quarter century, there has been an exponential growth of industries. Considering the significance of air quality on human lives, the World Health Organization (WHO) has developed guidelines for reducing the health effects of air pollution on public health by setting the limits of the concentrations of various air pollutants, some of which are ground-level ozone (O₃), nitrogen dioxide (NO₂), and sulphur dioxide (SO₂).

The foremost problem is the, including suspended particulate matter (SPM), carbon monoxide (CO), oxides of nitrogen (NO), oxides of sulphur (SO), lead aerosol, volatile organic compounds (VOC), and other toxics. severe environmental pollution which has caused defects of atmosphere, climate change, stratospheric ozone depletion, loss of biodiversity, changes in hydrological systems and the supplies of fresh water, land degradation and stress on systems of food producing, acid rain, and global warming [1] Stationary and mobile sources release various chemical pollutants

It is well known that some of these chemical pollutants have increased the occurrence of diseases such as lung cancer, pneumonia, asthma, chronic bronchitis, coronary artery disease, and chronic pulmonary diseases [2-3]. Hence, there is a growing demand for the environmental pollution monitoring systems. conventional air automatic monitoring system is large bulk, unstable operation and high cost. Due to high cost and large in size make it impossible for large-scale installation.

This system can only be installed in monitoring locations of some enterprises, thus system data is unavailable to predict overall pollution situation. To overcome defects of the traditional monitoring system and detection methods and to reduce test cost, this work proposes a method combining IOT technology with environment monitoring .The commercially

II. RELATED WORK

The concept of air purifier was first introduced by German brothers Manfred and Klaus Hammes in 1963 for home use. This method was later inspired by industries for air purification. This system consist of smoke sensor ,humidity sensor ,temperature sensor which detects the respective values and sends to the arduino UNO processor. Then the air purifier connected to the output pins of the arduino processor

When the level of CO_2 increases in air and the smoke level gets abnormal the air purifier gets activated and remove the unwanted gases in air and the purified air comes out of exhaust fan

The work in this paper is divided into two stages.1) Air quality detection 2) purification. The sensors present in the system detects the unwanted gases present inside the air. Then the purifier gets activated and removes the gases then the purified air comes out from exhaust fan

III. METHODOLOGY

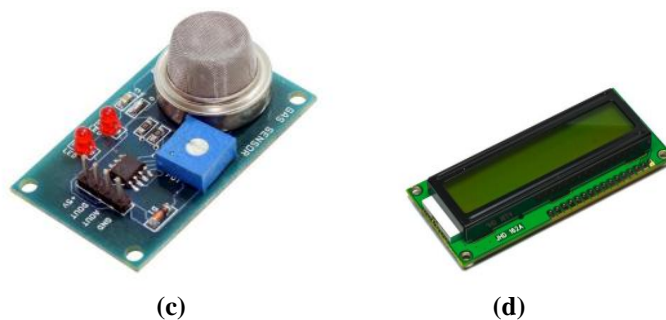
We are implementing the new method of air purification system in metropolitan cities. The system comprises of solar energy which provides power to the entire system. We can able to monitor the atmospheric smoke level by using smoke sensor and in addition to that the environmental off once the smoke level become abnormal and it will be automatically updated to the IOT. Temperature will be monitored by using smoke sensor. All the sensor details will be continuously monitored by the microcontroller and if the smoke level becomes abnormal then the microcontroller will give a command to the driver circuit to turn the purification mechanism. All the details will be displayed in the LCD and it is automatically updated to the IOT server.

IV. EXPERIMENTAL RESULTS

Figures shows the components of air purification and detection of impure gases. Fig(a)shows the arduino microcontroller. This monitors the entire process and helps to update in server. Fig(b) is the battery which provides power to the entire system and it is charged by solar panel.



Fig(c) is the MQ-8 gas sensor at the operating voltage 5vdc and detects the impure gases like CO_2 , NO_2 etc. FIG (d) is LCD which displays the range of temperature and amount of gases present.



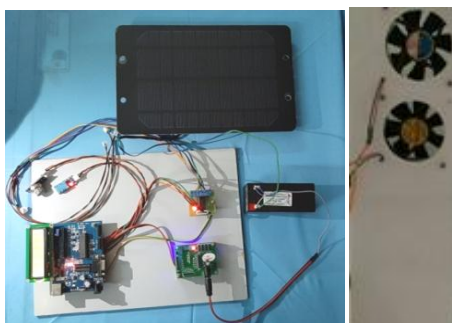
Fig(e) is the IOT module and it is the network of every objects embedded with electronics, software so it helps to display results in PC. Fig(f) is the solar panel which gets energy from sun and the battery gets charged by natural manner. Fig(g) is the overall setup of the system which is connected by above mentioned components.



(e)



(f)



(g)

The air purifier contains two exhaust fans one is used to suck the unwanted air and it purifies that air by using the various components connected together and the purified air comes out through another fan. It can purify the air about 95%.

V. CONCLUSION

We have implemented an AI based air purification technique to reduce air pollution. Our algorithm successfully detects the unwanted gases from the air which consists of several chemicals and purifies the impure air successfully

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