IJCRT.ORG ISSN : 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

A SURVEY ON IOT-ENABLED WIRELESS SENSOR NETWORKS PREDICTS AIR POLLUTION

[1]S.Jothilatha of 1st Author, [2]Dr.R.Shankar, [3]S.Duraisamy

[1]Research Scholar , [2]Associate Professor, [3] Assistant Professor

[1]Departmentof Computer Applications ,

[1st] St.Joseph's College for Women,Tirupur,India

Abstract: Air pollution has been increasing due to various number of factors, which includes Population growth, increasing vehicle usages, Industrialisation and Urbanisation, and others – pollution levels kept rising ever. These variables make negative impact on Heath human beings. In order to monitor this, an Internet of Things (IoT)-based wireless sensor networks which is coupled to world of net via wireless communication technologies. Using the MQ135 sensor, these sensors could able to monitor the air quality characteristics, including temperature, humidity, and pollution levels. On gathering , the data is sent to a central server or cloud platform for visualization and analysis. This makes it possible to track the amount of air pollution in a certain location in real time and can help with air quality decision-making.

Keyword : Sensor , Internet of Things, Wireless Sensor Networks

I. INTRODUCTION

Pollution of the Air is the major issue for every nation, either developed or developing. Health issues are growing day by day especially in cities of developing countries where urbanization and growing vehicle numbers pollutes the air. Adverse effects of pollution can cause illness such as respiratory, cardiovascular and even neurological diseases, bronchitis, pneumonia and aggravated asthma and mild health problems like nose, throat and eyes irritation. As per the observation, more than 2,50,000 people are exploited to death

The Internet of Things (IoT) is the network of physical objects devices, instruments, vehicles, buildings and other items embedded with electronics, circuits, software, sensors and network connectivity that enable these objects to collect and exchange data. The Internet of Things allows objects to be sensed and controlled remotely across existing network infrastructure, creating opportunities for more direct integration of the physical world into computer-based systems, and paying way for refinement. The goal of the paper is to analyse the air pollution data received from wireless sensor networks and predict the pollution level accurately.

LITERATURE SURVEY :

There are four distinct categories of equipment to control pollution namely: Continuous Emissions Monitoring Systems (CEMS), Emissions control systems, parametric monitoring systems and oxidizers [1]. Each of these functions at their own respective places and minimise the pollution. Brief explanation of the above mentioned methods. Workers in the industry regularly measure emissions at major sources of pollution using CEMS equipment. Air filtering systems are emission control systems. They are responsible for capturing pollutants as they pass through them. Paper [2], Examine sophisticated air purifier systems with an emphasis on data processing and sensor integration.. In [3] Hossain et al. solar thermal collectors were intergrated to assess radiation from solar.In [4]Yoda et al. discovered invasion of air purifier in well being adults .In[5].[6] focuses on influencing factors when evaluating particulate matter levels on construction sites. In [7]. Gupta et al. carried out tests to gauge how well a solar air heater prototype

performed in different scenarios, evaluating efficiency and thermal stability by analyzing the data gathered. In [8]. [9] detailed about wireless sensor network system for real-time analysis in urban settings. [10] look into The capacity of activated carbon to extract sulfur particles from smog, providing information on reducing smog pollution in [11].[12] probe the jolt of air purifiers on respiratory health of human being

METHODOLOGY

It is proposed to monitor and sense air pollution based on the findings of the analysis and the choice of the best IoT complex technology solutions with the proposed system architecture

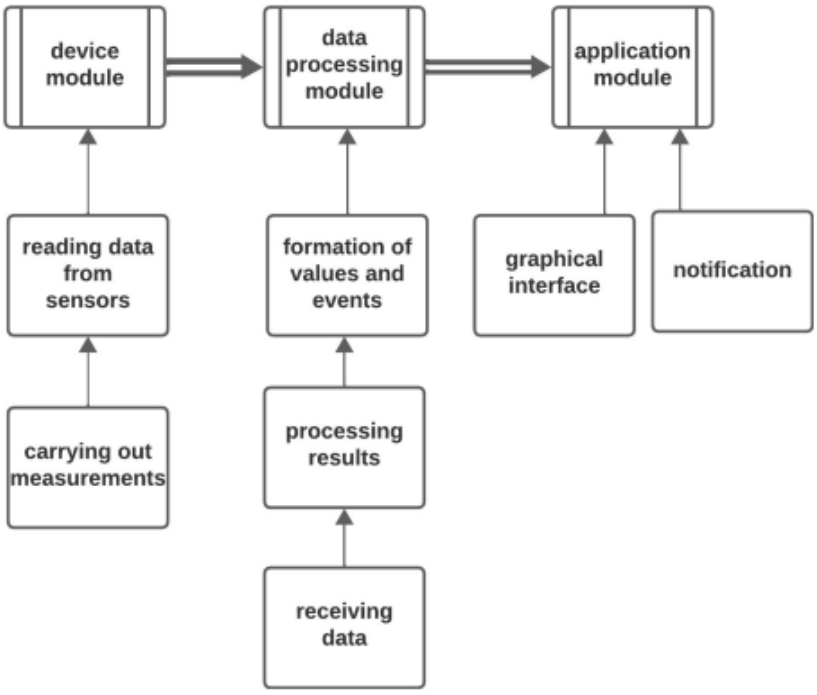
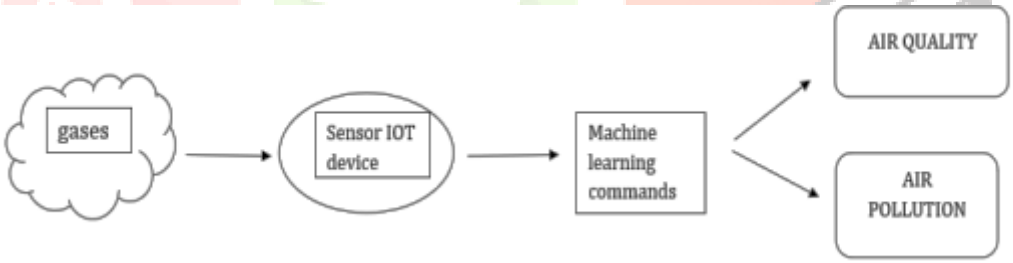


Fig. 1: IOT -framework

The framework explains clearly about the working model of IOT devices in deriving air quality and predicting air pollution.



The data received from the previous researches and predictions, we can conclude the levels of air pollution as per the below table

Air Quality Status	Air Quality Index- Parts per Million (PPM)	Description
Good	0 to 50	Air pollution is little with no risk. The cleanness of the air is satisfied.
Moderate	51 to 150	Accepted quality of the air conditions, but some pollutants may cause diseases for sensitive people.
Unhealthy	151 to 200	Very harmful and may cause death.

CONCLUSION

Consideration is given to the issue of air quality monitoring that relies on the automated communication between multiple devices that send data via Internet of Things technology. To provide a safe and comfortable environment for working and using electronics, it is crucial to evaluate the indoor air quality criteria limits accurately. Measuring variables like CO2 concentration, humidity, and air quality can help spot any issues and make it easier to take prompt action to address them.

REFERENCES

[1] V. Upadrista, The IoT Standards Reference Model, in: IoT Standards with Blockchain: Enter- prise Methodology for Internet of Things, Apress, Berkeley, CA, 2021, pp. 61–86. doi:10.1007/ 978-1-4842-7271-8_4.
2. W. Yining, W. Wenbo, Z. Zufeng, Z. Ping, and J. Haowen, "Design and Research of Intelligent Air Purifier System," in 2020 IEEE International Conference on Mechatronics and Automation (ICMA), (2020)
3. M. S. Hossain and A. Kumar, "Design and experimental study of a solar-powered water heater," International Journal of Renewable Energy Research, vol. 10, no. 3, 1565-1572, (2020)
4. A. Shiue, S. C. Hu, and M. L. Tu, "Particles Removal by Negative Ionic Air Purifier in Cleanroom," Aerosol Air Qual. Res., vol. 11, no. 2, 179–186, (2011)
5. Y. Yoda, K. Tamura, S. Adachi, N. Otani, S. F. Nakayama, and M. Shima, "Effects of the Use of Air Purifier on Indoor Environment and Respiratory System Among Healthy Adults," Int. J. Environ. Res. Public Health, vol. 17, no. 10, (2020)
6. I. P. S. Araújo, D. B. Costa, and R. J. B. de Moraes, "Identification and Characterization of Particulate Matter Concentration in Construction Jobsites," Sustainability, vol. 6, 7666–7688, (2014)
7. Z. D. Bolashikov and A. K. Melikov, "Methods for Indoor Air Disinfection and Purification from Airborne Pathogens for Application in HVAC Systems," in Proc. sixth international conference on indoor air quality, ventilation & energy conservation in buildings, 565-573.(2017)
8. S. Gupta and R. Singh, "Design and optimization of a solar air heater for residential heating applications," Solar Energy, vol. 171, 545-555, (2018) E3S Web of Conferences 529, 04016 (2024) ICSMEE'24 https://doi.org/10.1051/e3sconf/202452904016 12
9. J.-H. Liu et al., "An Air Quality Monitoring System for Urban Areas Based on the Technology of Wireless Sensor Networks," Int. J. Smart Sens. Intell. Syst., vol. 5, no. 1, 4230–4244, (2012)
10. S. Ge, Z. Liu, Y. Furuta, and W. Peng, "Characteristics of Activated Carbon Remove Sulfur Particles Against Smog," Saudi J. Biol. Sci., vol. 24, no. 6, 1370– 1374, (2017)
11. S. B. Divate and R. V. Hinge, "Review on Research Removal of Phenol from Wastewater by Using Different Methods," Int. J. Sci. Res. Publ., vol. 4, no. 1, 2250– 3153, (2014)
12. K. Smith, L. Johnson, J. Davis, A. Wilson, and B. Thompson, "Impact of Air Purification Systems on Indoor Air Quality and Respiratory Health in Healthy Adults," Journal of Environmental Health, vol. 25, no. 4,. 321-335, (2021)