

International Journal of Innovative Research in Science, Engineering and Technology

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Visit: www.ijirset.com

Vol. 9, Issue 2, February 2020

Safe Route on The Basis of Detecting and Analyzing Dust Prone Area

Pawan Kanta More, Aparna Nanasaheb Kolape, Premnath Ashokrao Kadam, Prof. Viresh Chaptre
B.E. Student's, Department of Information Technology, Zeal College of Engineering & Research, Pune,
Maharashtra, India.

ABSTRACT: The Sicer Route is an application which has a study of all routes and location in World of having dangerous types of dust, this application is a kind of well-wisher to users. This will guide them through their journey. Basically it is used to travel from less polluted and safest routes to their destination. This application has database which holds the polluted cities data, it has been regularly updated with the help of a sensor from every connected location it will be very much helpful to every user to track the polluted dust types in his route & he can change or reroute his or her path as safest path or route according to it. And this project will also provide total dust effected areas database to government which will also help them to control or monitor the dust pollution with new technology

KEYWORDS: Safe Route, Dust, Aerosol, Pollution, Airborne, Gases, Android App.

I. INTRODUCTION

Nowadays the health issues are mostly caused due to the aspects with concern to Dust. Various types of dust are present in the environment which is very harmful. So we are hereby working on a project for developing an android app + hardware system which will detect the type of dust and track the area affected & reroute people with safe zone to their destination. Due to the globalization and advanced industries today the natural air becomes too much polluted. Current world survey tells that the natural air has been 80% contaminated, Helsinki, Finland is the cleanest city in world, which haves air quality is 90% clean & the most polluted city in world in 2019 is Gurugram, from India. If we select 30 polluted cities from world then 22 are from India, which basically leads to high risk diseases to peoples, animals, birds etc. future of world can be finished. The Sicer Route is an android based app which basically has all database collected of cities and all routes which tells the contaminated dust types in air in every area through which the user can easily access the safest route from their source point to destination point. Provide total dust effected areas database to government which will also help them to control or monitor the dust pollution with new technology.

II. LITERATURE SURVEY

As specified in[1] International Standardization Organization, -"Dust: minor solid particles, which are under 75 μ m diameter are take non high priority as those particles, which gets settle do wnunder the irself-weight but it may remain floating in the air for some time. "Dust: solid, Small, dry particles blown into the air by natural forces, such as man-made, wind and by or volcano eruption processes such as milling, screening, demolition, shoveling, grinding, crushing, drilling, bagging, conveying, and sweeping. Dust particles are basically in the range of size about from 1 to 100 μ m in diameter, and they get settle slowly with the pressure of gravity

Examples [2] of the types of dust found in the air environment include:

- Mineral dusts: containing cement dusts, coal And crystallinesilica;
- Metallic dusts: cadmium , lead, beryllium, &nickel;
- chemical dusts: different pesticides andchemicals

International Journal of Innovative Research in Science, Engineering and Technology

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Visit: www.ijirset.com

Vol. 9, Issue 2, February 2020

- Organic and vegetable dusts: Tea dusts, Cotton, wood and flour, pollens;

A system [3] basically designed with the component consisting optical dust sensor GP2Y1010AU0F. Using a virtual instrument which is used for system monitoring and data storage. As compared to the latest technology the accuracy is less with less range of the dust sensing capability.

It has a single base station configured to a PC and an automatic sensing equipment consist of an optical dust sensor. A Transceiver is connected between these two points for brilliant wireless communication. The awesome distance is 300m on open space and 100m between the two units in buildings. As mention above the virtual instrument is made to show all the database which is been made up of n numbers of data monitoring.

Among different process for dust density study the most favorite from all is the optical significant. An exhale light beam from Sensor will be bombarded so the dust particles are scattered on the receptor. And then pulse signals is generated according to the received particles by the receptor. Measures the dust density it also need analysis and storage of the gain results which are usually finished by a PC app. later, the PC app also may provide different visual presentations & difficult data processing of results. So here we have a system which is designed for testing and monitoring dust density which will give us the approx. result of the measurement of the Dust available and the type which they have assigned in the data set.

In this paper [4] detailed understanding study has been taken to detailed characterized atmospheric aerosol particles in forms of ionic constituents & carbonaceous species for a year cycle at Pune, Maharashtra, India. This study gives the proof for the ionic chemistry, lower aerosols creation, temporary variability and basically its result in climate in the atmosphere. The avg. close attention of PM_{2.5} and PM₁₀ were 109.6 ± 23.2 and 166.9 ± 4 $\mu\text{g m}^{-3}$, respectively, by far exceeding World Health Organization (WHO) & National Ambient Air Quality (NAAQ) standards. Seasonal analyses shows that PM_{2.5} and PM₁₀ mass concentrations were higher in the after monsoon followed by the winter season and lower during the monsoon season. The avg. concentrations of organic carbon (OC) and elemental carbon (EC) were 31.3 ± 7.4 and 4.2 ± 2.4 $\mu\text{g m}^{-3}$ for PM_{2.5}, while, 34.2 ± 6.2 and 5.0 ± 2.3 $\mu\text{g m}^{-3}$ for PM₁₀, it was as winter > post-monsoon > summer > monsoon. The overall chemical analysis shows that it consist higher PM concentration.

Here in this [5] paper we studied analysis and interpretation of periodic, weekly and seasonal chart of 1-hr avg. PM (PM₁₀, PM_{2.5} and PM₁) attentions measured near an urban area in Chennai city, India, as on Nov. 2007 to May 2008. The Particulate Matter data analysis described clear diurnal, weekly and seasonal period at the study area. In timing cycle, highest PM concentrations were observed during weekday's peak hrs. traffic and lowest PM concentrations were found during poor traffic (afternoon and nighttime). The seasonal PM data analysis showed highest concentrations during after monsoon season (PM₁₀=189, PM_{2.5}= 84, PM₁ = 66 $\mu\text{g/m}^3$) compared to winter (PM₁₀ = 135, PM_{2.5} = 73, PM₁ = 59 $\mu\text{g/m}^3$) and summer (PM₁₀ = 102, PM_{2.5} = 50, PM₁ = 34 $\mu\text{g/m}^3$) seasons. The particle size distribution during after monsoon, winter and summer seasons showed two distinct modes viz. accumulation (mean diameter, d = 2.2 μm ; distribution = 40%) and coarse (d = 7.1 μm , distribution = 60%).

III. SYSTEM DESIGN

The System details can be visualized below using following fig(1), in that there are two models at first the hardware and database connectivity is shown and in second we can see the system design of application.

International Journal of Innovative Research in Science, Engineering and Technology

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Visit: www.ijirset.com

Vol. 9, Issue 2, February 2020

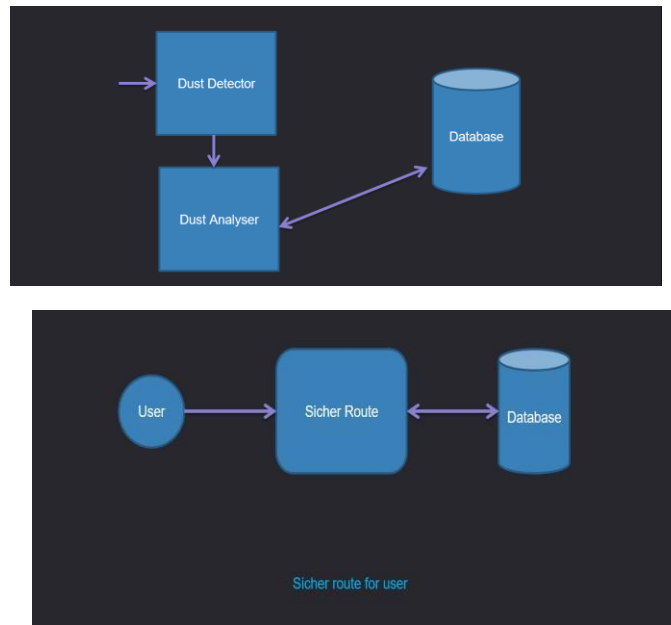


Fig. 1. System Design

IV. SYSTEM MODULE

Sicher Route App: it is an application which is going to give an overview of dust effected areas to user which will guide him/her with his journey. This app will guide users and patients with their whole journey with dust free route.

Optical Dust Sensors: GP2Y1010AU0F is optical dust sensors which operate without the sensor are more heat resistor. It is suitable for low-power systems. Basically its work is to bombard the optical rays on the particles which will be scattered and received by receptors and finally it will produce the approximate value of dust density.

Database: It is used to store total data which is been monitored while running the project. Data is been going to generate after running the system and will produces logs of every seconds and it will be stored in the database. The stored data will be used in application to detect the dust affected area and will be helpful to guide through the route selection. In future the same data will be used for machine learning.

International Journal of Innovative Research in Science, Engineering and Technology

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Visit: www.ijirset.com

Vol. 9, Issue 2, February 2020

V. HIGH LEVEL DESIGN

It is the High level design which simply describes the total connectivity of how the system is interconnected with each other. This diagram details the i/p connection of database and all sensors

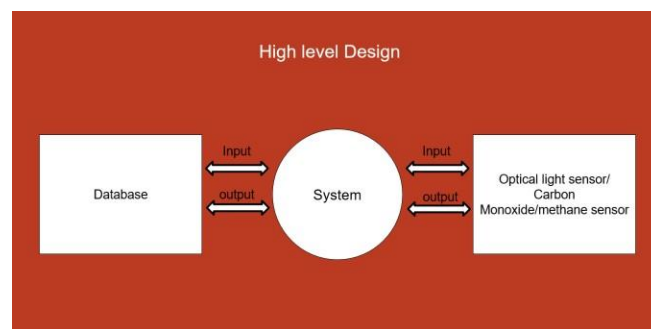


Fig. 2. High Level Design

VI. EXISTING SYSTEM APPROACH

Here the prototype of wireless system for dust presence detection is shown. The system is designed as inexpensive commercially available. It provides only the dust presence ratio



Fig. 3. Existing System

VII. PROPOSED SYSTEM APPROACH

This app is used basically for medical cause and general purpose.

This app will be most helpful for community mostly for kids and patients.

This app will basically show a map for users who want to travel for their destination through safe route. This will also use to develop a report or data sheet which will helpful for machine learning in future

This will also help Government to re-investigate the areas which produces more dust as from decided productions contract, which leads for high risk for the nearby situated local residents.

International Journal of Innovative Research in Science, Engineering and Technology

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Visit: www.ijirset.com

Vol. 9, Issue 2, February 2020

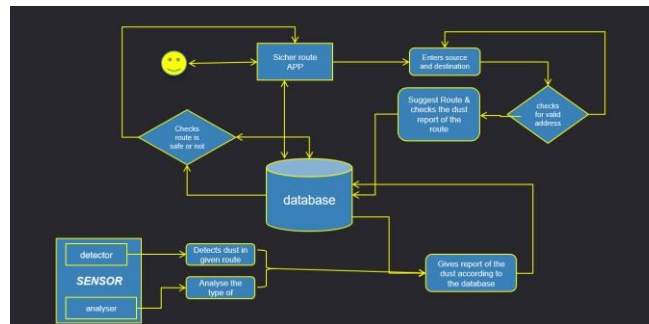


Fig. 4. Proposed System

VIII. METHODOLOGY USED

Arduino Uno Board: It is used to connecting all the hardware sensors with it.

1. Arduino Studio: Java language is used for configuring all the sensors init.
2. Android Studio: It's an platform to develop a android app

IX. CONCLUSION

Thus we conclude that after implementation of this project it will help to detect the type of dust & its density from the air and help people to take possible precautions to its user.

X. FUTURE WORK

Can be developed on advanced system, which can also help for controlling the dust in detected area. It can also be used in the future to do deep research on dust production and reducing dust production. So less effort will be taken to reduce dust. In the future, a sensor can be developed which can detect the exact type of dust.

REFERENCES

- [1]. WORLD HEALTH ORGANIZATION, "Air Borne" – WHO/SDE/OEH/99.14 – 2014
- [2]. Rohi Jan, Ritwika Roy, Suman Yadav, P. Gursumeeran Satsangi "Exposure assessment of children to particulate matter and gaseous species in school environments of Pune, India", published on 3 November 2016
- [3]. Uglješa Z. Jovanović¹, Igor D. Jovanović², Andrija Z. Petrušić³, Zoran M. Petrušić⁴, Dragan D. Mančić⁵ "Low-cost Wireless Dust Monitoring System" - IEEEE - 2013-2014.
- [4]. Atar Singh Pipal¹, Suresh Tiwari², P. Gursumeeran Satsangi¹, " Seasonal Chemical Characteristics of Atmospheric Aerosol Particles and its Light Extinction Coefficients over Pune, India" – 2015
- [5]. Srimuruganandam Bathmanabhan, Shiva Nagendra Saragur Madanayak , " Analysis and interpretation of particulate matter – PM10, PM2.5 and PM1 emissions from the heterogeneous traffic near an urban roadway"