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Air Polluted Path Monitoring System

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Abstract: *Air pollution awareness is very important to the citizens, especially for those people who suffer from illnesses because of the air pollution. There are different types of pollution one of them is the air pollution, this pollution causes so many health issues. Air pollution is increasing know a days because of huge vehicular traffic. This huge vehicular traffic generating horrible gases in air. Which includes gases like Sulphur Dioxide, Nitrogen Dioxide, and Carbon Monoxide etc.*
There are different systems that reminded best early route to the user, but no any route which is better for the human health. So it's very important to travel healthy. This project develops a model that remanded route to the user, which have less air pollution and healthy for the user. Dijkstra algorithm is used into this model to find the less air polluted path. This project is definitely initiative for the healthy lifestyle of every person.

I. Introduction

Form last few years, pollution in large quantities has been increased in our environment. There are so many ways of the pollution, one of them way is through the air. Due to air pollution so many people are suffering from illnesses. From air pollution different disease occur like a lung cancer. Air pollution is increasing because of the huge vehicular traffic, which generate the harmful gases in environment.
So there is need of the system that recommend less air polluting route to the user who is traveling. There are different systems that recommend route to the user which is less distance from source to destination. But no one system that provide a route which is less air polluted.

Therefore, here we are developing a system that calculating a route which is less air polluted and recommend while user traveling from one source to destination. This route will take more distance, more time to reach at the destination, but recommend route which is less air polluted and healthy for user.
This model is definitely helpful for those people who are suffering from disease which is occurred due to air pollution and also helpful for a people who are traveling daily, to protect their health from the harmful air pollution.

II. Existing System

Over the past years there are different systems developed on route monitoring to calculate distance and time to destination from source. But there is no any existing system that calculate and monitoring route which is less air polluted**.**

III. Proposed System

Proposed system provide such path which will have the less air pollution from user source to destination. Here present model that returns a route which is less air polluted.

An air polluted path monitoring system can be find out the less polluted path. User can set the source and destination. Applying Dijkstra's algorithm to calculated the pollution and recommended the less polluted path. This feature will use for the admin login into the system. This is also gives high priority requirement of system because it gives shows the list of less polluted path or add area which is added by govt. of India or CPCB. This is the main functionality of the project.

The System effectively used for travelling. User must have to add source and destination where he wants to travel. This is also gives high priority requirement of system because it gives shows the list of less polluted path.

The overall block diagram of the proposed system is given below:

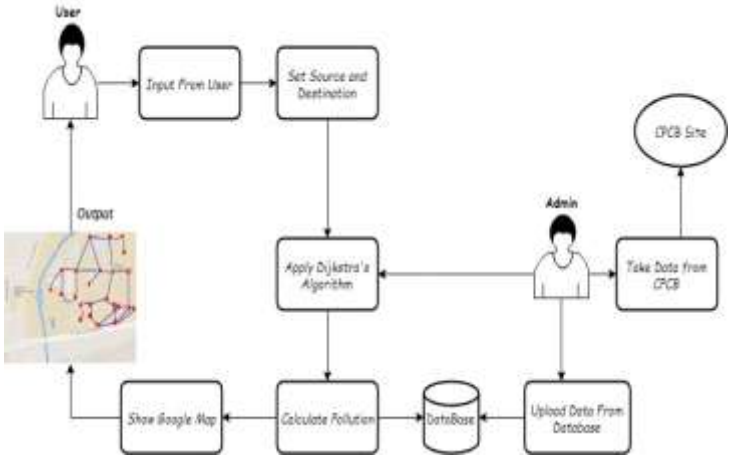

Fig:1 Block Diagram

At the first level input is taken by the system is the user credential that means user. And output will be the user login success. At the second level input is taken by the system is the request for the air polluted data to CPCB. And output will be air polluted data will take from CPCB and inserted into database by admin.

At the third level input is taken by the system user is the set source and destination locations. And output will be show less air polluted path display to the system user by admin.

In this project basically four modules are included, which are listed as following:

1) Admin module
2) User module
3) Less air Polluted Path
4) Recommendation of Less Air Polluted Area Path

- **Admin Module:**

Admin module is used to add the pollution data by area wise into into the application. This air pollution data are taken from CPCB side of government.

CPCB side is the government of India website which display the data of different pollution. Air pollutions data are display by city wise and different gases present in that area. This data will take the admin module to calculate the less air polluted.

- **User Module:**

User module login into the system and set the source and destination for the find out the less air pollution route for travel healthy. User module is the main part of the project which will use this application.

• Less Air Polluted path:

Less air polluted path module will calculate the less air polluted route using the air polluted data which is taken from the CPCB side by admin module. This Less air Polluted path is calculated using the Dijkstra algorithm.

- **Recommendation Less Air Polluted Area Path:**

This module is basically used to display the less air polluted areas route to the user module which is calculated by the Less Air Polluted path module. This route is between the areas of source to destination which is set by the user module.

Algorithm Used:

In this project two algorithms are used which are listed are following:

1) Dijkstra Algorithm:

This algorithm used in this project for the finding the less air pollution path from different levels of the air polluted data.

2) AES Algorithm:

This algorithm used in this project for the encryption of the user credentials.

IV. Mathematical Model

Let S ={ I, C, fmain, DD, NDD, O, Success, Failure}
Where
s = system.
The GUI provides user Login / Registration for the system after that user enter Source and Destination.

Input
I = {I1, I2, I3, I4}
1. I1: Login Credentials
2. I2: Source
3. I3: Destination
4. I4: Concentration of gases after particular time interval

Constraints
C = {C1, C2}
1. C1 : Limited only for Delhi state
2. C2: Only 14 locations of Delhi from where concentration of gases are obtained.

Functions
fmain = { F1, F2}
1. F1: Check login Credentials
2. F2: Implementation of Dijkstra Algorithm
3. F3: Calculation of AQI

Deterministic Data
DD = Deterministic Data. Such data which is predicted before execution of project. We have 14 number of location from one of the input is coming after every 15 - 20 minutes.

Non Deterministic data
NDD = Non Deterministic Data. Such data which cannot be predicted before execution of project. We cannot predict what is going to be the weights of the edges of the graph before execution.

Output
O = O1, O2
1. O1: Login Successful
2. O2: Optimal path between source and destination

Success
Success = S1, S2
1. S1 = Air Quality Index Calculated
2. S2 = Optimal path generated

Failure
Failure = Fl1, Fl2
1. Fl1 = to retrieve data from pollution monitoring station website.
2. Fl2 = Disconnection of platforms.

V. Literature Survey

Over the past year, there are different system developed that monitoring the route for distance and time. Also there are system that monitoring the pollution, like system that monitoring air pollution. But no one system that recommend a route using air pollution.

1) Paper Name: Scalable Measurement of Air Pollution using COTS IoT Devices
Author Name: Varun Jain, Mansi Goel, VinayakNaik, Ramachandran Ramjee

Air pollution levels have been rising at an alarming rate for the past ten years. The situation is considerably worse in developing nations, such as India. The average concentration of PM10 in Delhi has increased by over 66and 2010 and continues to increase further. Rising air pollution has been shown to have a detrimental effect on human health.

2) Paper Name: Extracting Patterns and Variations in Air Quality of Four Tier I Cities in India
Author Name: Alka Yadav; DurgaToshniwal

The cities in India are classified into Tier I, II and III based on population. Air pollution is an issue of major concern as it has adverse impact on human health and ecosystem. Tier I cities in India have high levels of pollutants due to increased vehicles, industrial units etc. In the present work, the air quality data from New Delhi, Mumbai, Chennai and Bengaluru has been used.

In this paper, we are going to develop a model that overcomes the previous systems. We are going to develop a system that display the route using air pollution data, which will have less air pollution.

VI. Conclusion and Future Scope

In previous research we addressed the problem of achieved to find out shortest path with minimum pollution using Dijkstra Algorithm. To full fill the user requirement for the searching path in this way we have achieved to find out shortest path with minimum pollution using Dijkstra Algorithm. Here we are taking AQI index from CPCB website which is being updated after every 15-20 minutes. We are taking inputs from user through mobile app. Computing shortest path using Dijkstra Algorithm and results are send back to user on mobile app and those results are displayed using Google maps. With the accurate result.

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