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Poster: Air quality friendly route recommendation system

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Citation

POSTER: Air Quality Friendly Route Recommendation System

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1. GOAL

To model the overall personal inhalation of hazardous gases through the air (both indoor and outdoor) by an individual, provide air quality friendly route recommendations, thus raising the overall quality of urban movement and living healthy life.

2. MOTIVATION

Knowingly or unknowingly human beings are carrying a heavy burden of air pollution on their health. The World Health Organization (WHO) reports the death of 7 million people annually due to air pollution. People die due to air pollution induced diseases like ischaemic heart disease, Lung cancer etc. The International Agency for Research on Cancer (IARC) reports that air pollution killed 2,23,000 people in one year from lung cancer worldwide. So it is motivating to design such a system which can evaluate the quality of routes in the real time and estimate the personal exposure to the environmental pollution and suggest alternative friendly, less polluted routes to the users, which can help in avoiding excessive inhalation of air pollution.

3. RESEARCH QUESTIONS

- What are the critical factors (f) that need to be considered to define the quality of the route like AQI, time taken to complete the journey, road conditions etc.

- Finding the most optimal and cost effective vector V $\{f_1, f_2, f_3 \dots f_n \}$ where f_N can be any factor as mentioned in the point above.

- Giving good personalized experience.

  Mapping the most optimal model which meets ones personal health and conditions, which for example may be different for young and old, patients with Asthma to those having a heart disease etc.

4. CHALLENGES

- Portable air monitors are still expensive.

- Integration with Fixed air monitors.

- Air pollution concentration mainly due to vehicular traffic, vary within the city, as much as inter city.

- Identifying factors influencing pollution like humidity, wind speed, location etc.

- Maintaining confidentiality of the user data as the medical history of an individual and his/her movement in the city can be purely confidential based on person to person.

5. PROTOTYPE

Current Navigation systems/transit planners consider only the time metric. We will consider *Air Quality* as one of the metric to compute the better routes. So we try to represent the proposed system prototype through the block diagram in Figure 1.
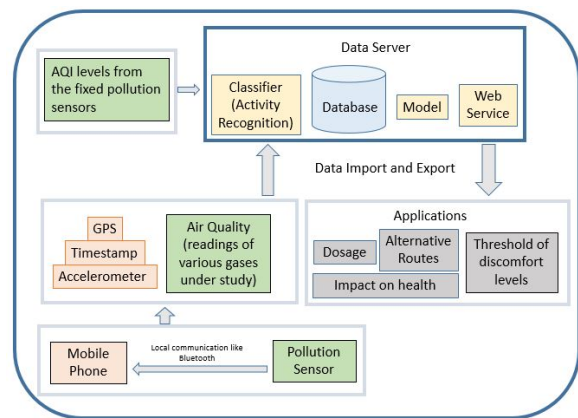

Figure 1: System Prototype

6. FINAL OUTCOME

It is hard to realize the effect of these pollutants, in a single day but if seen over a longer period of time, they are very hazardous to health resulting in critical illness which can lead to death or major diseases. As a final outcome of our project we wish to reduce the overall exposure to air pollution, leading a better and healthy life.