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Detecting and Analysing Urban Regions with High Impact of Weather Changes on Pollution

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Abstract: The urban planners need to understand the functional characteristics of various regions throughout the city, namely (i) Recognition of regional Weather-Traffic changes analysis throughout a city. (ii) Among complex regional features, such as road structure and population density. However these two questions are minor challenge to answer, because urban traffic changes dynamically on time and is substantially affected by many other factors. First we compose on these questions, by discussing the development a Weather-Traffic Index (WTI) system. The Weather-Traffic Index (WTI) includes two components: Weather-Traffic Index establishment and key factor analysis. In the proposed system, Weather-Traffic Indices extracted has to be validated to be surprisingly consistent with real world observations. Further regional key factor analysis gives interesting results. For example, the age of houses is symbolically impact on the WTI, which sheds light on future urban planning and reconstruction.

Keywords: Trajectory Analysis, Weather-Traffic Index, Traffic Prediction, Urban Computing.

I. INTRODUCTION

In [1] Urban Data Analytic (refers to the people creating and using the urban information) and service providing into a recurrent process URBAN computing includes urban sensing, data management, for an effective or efficient and continuous improvement of people's lives in the city environment. The aim is to solve different problems that have emerged in the city, few such problems are traffic congestion, energy consumption, and pollution, based on the data of traffic flow, human mobility, and geographical data, etc. The aim of the project is to overcome a variety of problems that have being arising in the city, few such problems are traffic congestion (this makes trip times longer and increases vehicle queuing), energy consumption, and pollution which is based on the data that has been generated on traffic flow, movement of people in that environment (population), and the data and information which has an impact on that location at that particular time (geographical data), etc. Taking all this as consideration, many works have been carried out to identify the impact of weather change on traffic for example, a heavy rain can slow down the traffic and cause overcrowded due to low vision caused by moisture in the air, the decreasing temperature (effects of cold weather) in very cold days might freezes the roads that might cause impact on the transport, etc.

Some of Example which depicts Weather Changes on Pollution are



Fig. 1 Pollution produced by vehicles.



Fig. 2 Pollution produced by industries.

II. PROBLEM STATEMENT

The main problem here is to cover a traffic details over all city. Now-a-days Air pollution is the main reason which affects the public health. The growth of population level and urbanization is increasing by the meteorological parameters. In this Existing approach there is no such efficient support for forecast pollution of Urban.

The following are the problems:

- A. Absence of Traffic monitoring System.
- B. Uses Manual Prediction.
- C. Accuracy is less.

III.LITERATURE REVIEW

In [2] Urbanization is a fast process which has influenced many people who are living in the cities, but also, they come across many issues, some of them are traffic congestion, energy consumption (wastage of fuel), and pollution. Urban computing is implemented, to overcome this type of problems by the use of the dummy data that has been recorded in cities (traffic flow, mobility, and geographical data). Urban computing will also include urban sensing, data management, data analytics, and service providing to a repeated process for an attractive, effective, efficient and continuous improvement of people's lives, city operation systems, and the environment. Urban computing relates more than one branch of knowledge like transportation, civil engineering, environment, economy, ecology, and sociology in the context of urban regions. Firstly, the concept of urban computing is being introduced that depends on its general framework and key challenges from the view point of computer sciences. Secondly, the urban computing applications are divided into seven fields they are urban planning, transportation, environment, energy, social, economy, public safety and security, which includes different scenarios (situation) in each category. Thirdly, the technologies which is being needed for urban computing are classified into four different fields, they are urban sensing, urban data management, heterogeneous data (variety of non-similar data), and urban data visualization. Finally, a information about the future of urban computing is provided which includes the topic that are missing in a community.

In [3] Urbanization is the more important factors of productivity and growth of urbanizing in the environment. Between the year 2014 and 2050, the urban area population will be increased by approximately 2.5 billion, which might reach up to 66% of the population in the earth. In 2030, China alone will have been nearly 1.5 billion of the population in the earth. India, Nigeria and Indonesia might overcome rapid growth in the population. The economic development depends on the increased productivity (population), which results in the absorption of people and economic activities in cities, so that can lead to an energetic market (deals with the supply of energy) and fertile environment which have innovation ideas and new technologies. Similarly, there is well-managed countries most of the cities, which can be taken as an example and continue to concentrate on the cities and implement the techniques which are still in bad economic condition, by using additional features and innovative ideas and technologies. In [4] there are many smart cities which focus (concentrate) on identifying the motion of vehicles which has hot spots? The research on hot spot in cities gives many different information, such as highly mobile environment (high mobility), strictly restricted on the size of the objects, and the varying biased samples. All these details are used to face the challenge which makes the density-based clustering algorithms fail to capture the real clustering property of objects, making the results which are very useless. A small idea to include the "sensors" to recognize the vehicle which get crowded in the nearby areas using their ability to move, instead of the "object representatives". Like this the mobility of some examples are naturally made legal. Some factors which cause the tight movement of vehicles has been identified and many techniques are used to overcome this situation. By considering the performance in mobility-based clustering which is based on real time traffic situation the traffic congestion can be overcome.

In [5] all the cities in the states have constant evolution (changes), due to different factors such as growing urbanization (population), fast communication and transportation. By understanding the composition of intelligent urbanization in cities, the urban computing and analysis tools has to be developed for improvement of roads in cities. Which will strengthen their evolution? This paper presents a spatial clustering which is used to identify regions and develop different use in cities. Urbanization is the physical growth of urban areas through which we can expect the result as global change in towns with increases in population. The United Nations have made a research and said that more than half of the people live in urban areas cities which are widely available and they provide a great opportunity to develop urban areas for urban planners to as they involve themselves in the development of the cities. That provides an opportunity to improve the knowledge of the people by giving them awareness about the environment and the surrounding. Urbanization includes different cities which is called urban patches, such as residential areas, business districts, industrial and recreational areas. Different types of urban patches will provide and solve different needs of people living in that area and "help the people know about the importance of organization technique for gaining detailed knowledge about metropolitan area".

In [6] Developing fastest controlling routes is more important for the weather transport. As predicted, some of the features for the transportation system consume more travelling time to predict the correct time. The authors in this project, have explained about the different traffic avoidance system that depends on the route developing technique and they originally use some large-scale GPS trackers and environment development tool, which is used to deploy a learning technic for the avoidance of the traffic control for the roads and it uses a Conditional Random Field (CRF). CRF is the normal formation and provides natural segments. All together this system provides a good routing technique to develop the areas and connect roads to transport easily. Finally, the result shows the estimation of the transportation time for controlling routes. In [7] according to the Advanced Traveller Information (ATIS) and Advanced Traffic Management Systems (ATMS) that are the two solutions for traffic congestion problem. These systems can be effective that generate strategies which should be creative that is based on predicted traffic conditions and as an opposition for

controlling. And should avoid many unwanted is similar in manner, resulting is simply transferring data such as the state of being crowded to another location. Dyna MIT (Dynamic Network system for the Management of Information to Travelers) that provides traffic predictions and travel guidance is based on going time, viewing path and mode choice decision. It supports both insistent and pictorial information. In order to make sure the honesty of the information provided or the guidance provided by Dyna MIT is consistent and that are considered by the experience of the drivers. Dyna MIT provides user-required references, which helps them to understand that the users cannot find a way which is to be compared with preferred one of the chose based provided information. In [8] Climate change is the statistical distribution (data about the population), it changes on weather direction, when that change for a long period. In this paper user aims the study that the economic wide effect of their Climate change on transportation assets. Climate change economically effects on transportation by increasing maintenance, operation, and repairmen costs of transportation. Climate changes can also increase the cost of new transportation structure, due to higher climate adaptable design standards. It also includes infrastructure replacement costs. It includes transportation infrastructures, climate change and also indirectly cause loss of infrastructure service and activity disruption. Climate change can cause the bring down travel times, higher cost choice required to address operational needs and arrangements yield for shipment when transport courses allow. In [9] Extreme climate changes will reduce effectiveness, performance, increases the cost of transportation and infrastructure that is long term duration. Climate change adaption research mainly focuses on more distinct and sudden contact for extreme events and more predictable changes in high level and storm surge. Research also primarily produced results at a micro economy scale or detailed engineering design scale. When the large portion of research also includes the impacts of temperature and weather changes, it is often qualitative or quasi-quantitative and moves to focus on events like flooding or heat waves. Less attention has been paid to quantifying the more uncertain, slow, and low impacts from long-term changes in climate, even though those changes stands a similar, if not greater, risk to infrastructure. The model is based on two strong strategies, a proactive “climate-proofing” approach which modifies design and construction of roads impact to predicted climate change, and a reactive is used to repairs the increased damage caused by climate change to maintain the original lifespan of the road. In [10] the real time highly secured spatiotemporal data on transportation for major cities have become available. The data that has been used is to learn about traffic behaviour at different times and locations. This results in saving of time and fuel, which are the two most important commodities. At first utilization of data, in the real-world have been collected from Los Angeles Country transportation network in order to include the natural behaviour and time-series technique (series of data in time order) to implement its speed for traffic prediction. At times traffic prediction that has been utilized consider the spatiotemporal (which includes space and time) behaviours of peak hours and events to perform a more applicable predictions for both short-term and long-term average speed on particular portion of the road, in presence of unusual events. This results by considering the speed hour behaviour, which can be improved by the accuracy of traditional predictors up to 67% and 78% in short-term and long-term predictions respectively.

IV.METHODOLOGY

A. Data Preparation

The network of the city road parameters is being divided into different cells through Voronoi diagram, which is used to find the road sub divisions. For each and every cell, the traffic factor or the information is being extracted from the Web Server and current datasets are collected.

B. Connection Establishment

This phase is useful for analysing a traffic parameters and it is connected to each and every cell by analysing traffic and weather data or information.

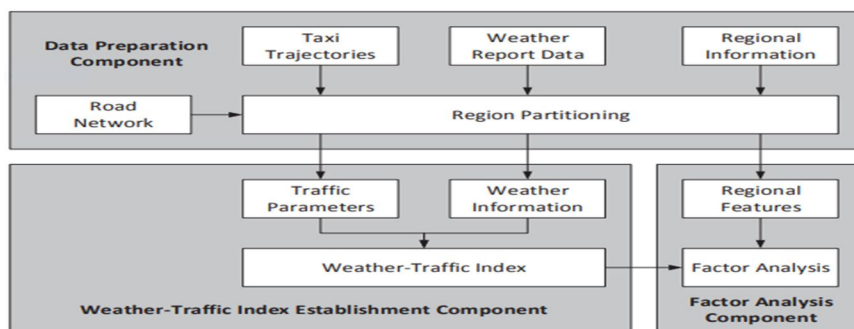


Fig 3.Index Establishment Phase.

C. Examine Parameters

The main theme of the work is to recognize a traffic details for improving weather conditions changes. So by knowing the weather conditions details of previous we can predict the data based on weather conditions. The parameters which are used in analysing weather conditions recognizes key factors and their status related to weather traffic.

V. RESULTS

A. Displaying the Details of the Current Data

Used to view the data that is been extracted from the dataset of the particular area selected, which includes the date of which the data has being entered in to the dataset and also includes the time of which the data was stored. It shows the percentage of different pollutants in the air and the disease caused by those pollutants in the air.

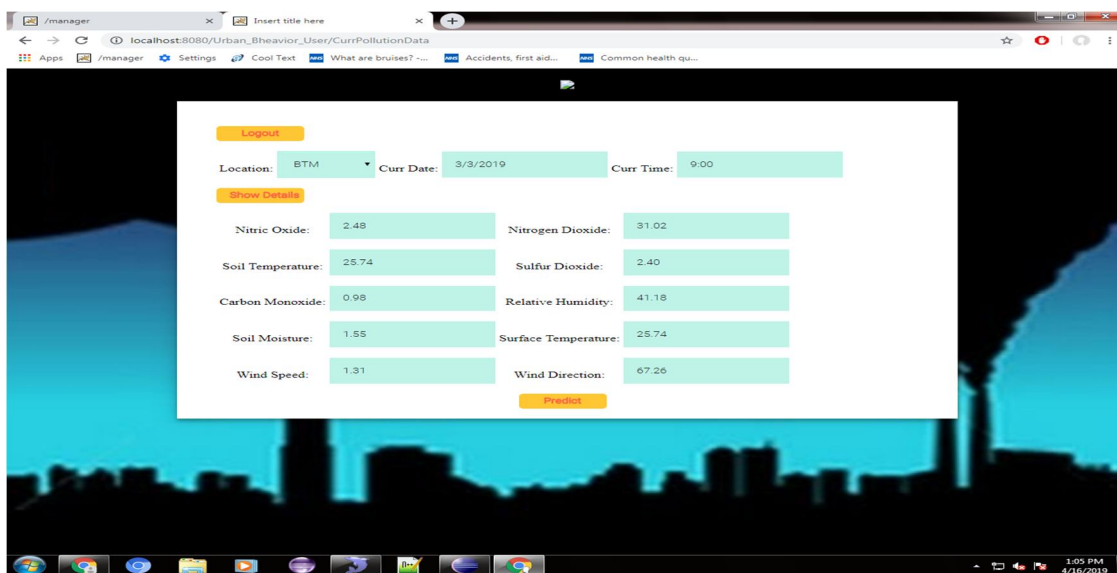


Fig 4: Displays the Current Data.

B. Predict Process

The figure shows the predicted values after performing the prediction process, by comparing the previously stored data and the current data, that has being extracted from the dataset of the particularly selected area. This prediction is used by the person to know about the changes in the weather condition for the next day.

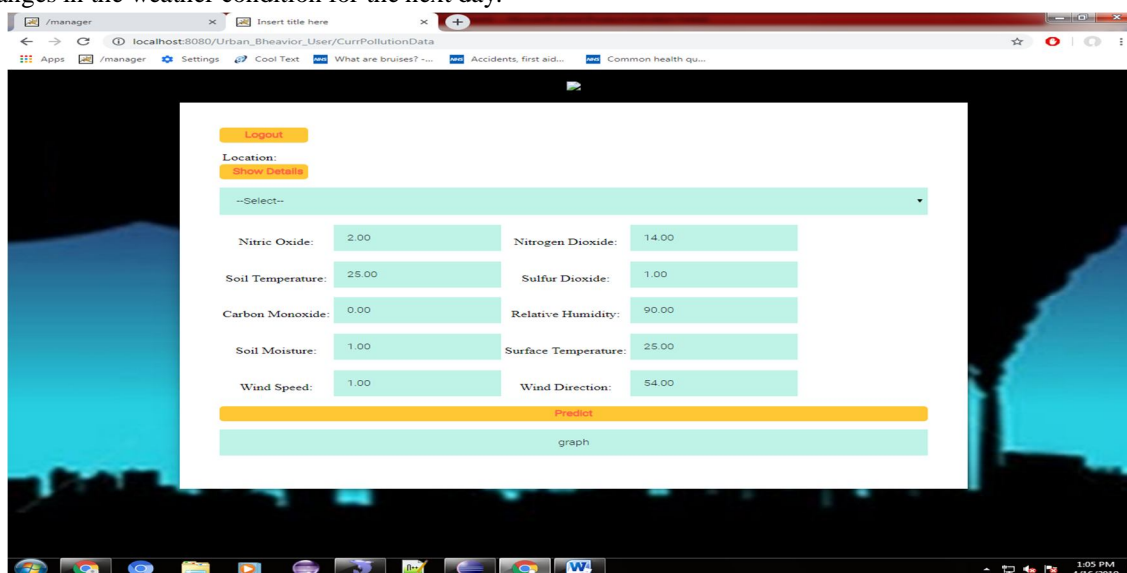


Fig 5: Displays the Prediction Process.

C. Graph Display

Graph shows the comparisons of the previous data and the predicted data. By looking at graph the user will be able to analyse the changes in the weather, which helps the user to know the weather changes that will be happening on the next day.

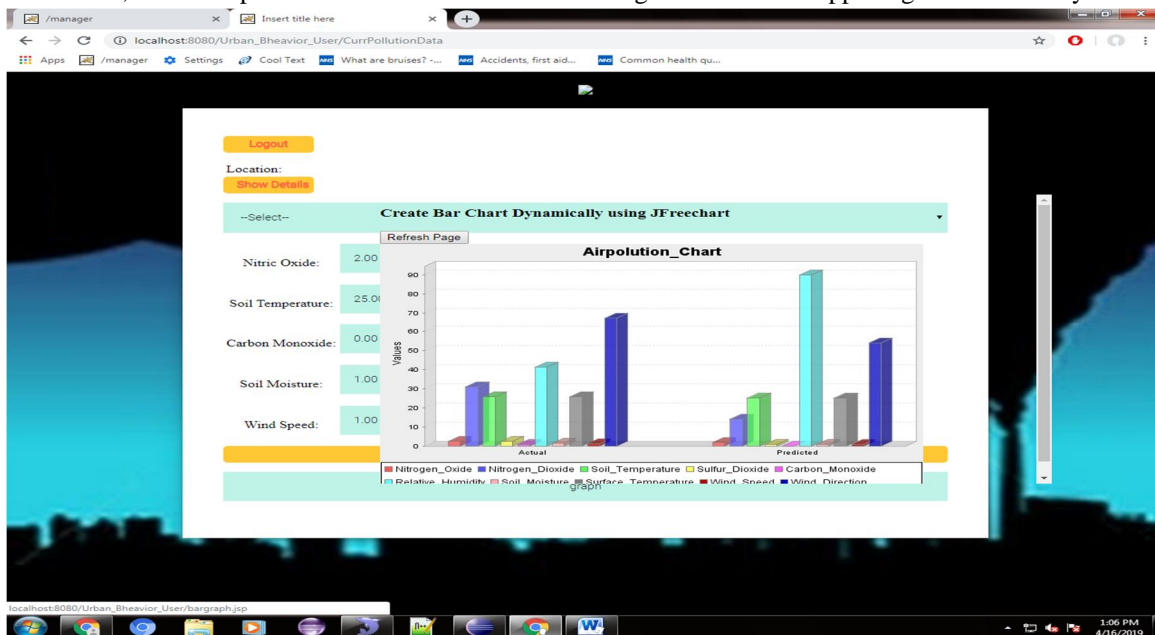


Fig 6: Displays the Predicted Graph Chart.






VI. CONCLUSION

It is more important to know the impact of weather to traffic from few locations to all roads network through-out city. Still weather is unpredictable. By using prediction process we predict the weather changes and transport by using some of the parameters (nitric oxide, carbon monoxide, nitrogen dioxide etc.). We predict that what will happen in next day. The regional weather-traffic indices extracted have been validated to be surprisingly consistent with real world observations. Further regional key factor analysis gives interesting results.

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