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DETECTING AND ANALYZING URBAN REGIONS WITH HIGH IMPACT OF WEATHER CHANGE ON TRANSPORT

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Abstract: **In this work, we focus on two fundamental questions that are unprecedentedly important to urban planners to understand the functional characteristics of various urban regions throughout a city, namely, (i) how to identify regional weather-traffic sensitivity index throughout a city, that indicates the degree to which the region traffic in a city is impacted by weather changes; (ii) among complex regional features, such as road structure and population density, how to dissect the most influential regional features that drive the urban region traffic to be more vulnerable to weather changes. However, these two questions are nontrivial to answer, because urban traffic changes dynamically over time and is essentially affected by many other factors, which may dominate the overall impact. We make the first study on these questions, by developing a weather-traffic index (WTI) system. The system includes two main components: weather-traffic index establishment and key factor analysis. Using the proposed system, we conducted comprehensive empirical study in Shanghai, and the weather-traffic indices extracted have been validated to be surprisingly consistent with real world observations. Further regional key factor analysis yields interesting results. For example, house age has significant impact on the weather-traffic index, which sheds light on future urban planning and reconstruction.**

Keywords **: WTI,WTSI, Road structure, population density, Key factor analysis.**

I. INTRODUCTION

Road congestion makes a great negative impact on the community and the environment. Road congestion can be reduced by two approaches like the following. First approach is to increase road capacity. However, it is very difficult, especially in urban environments. Second approach is to reduce demand in congested areas by providing information about road status so that drivers change mode of transport, or alter the route or time. Collecting traffic information on road by using infrastructure sensors such as CCTVs, loop sensors in roads, and so on has some limits. The sensors cannot cover the whole road until deploying them the whole road with an enormous sum of money. Recently, with the rapid increase in vehicles equipped with such smart devices as black boxes or smartphones that are capable of communication, it becomes possible to collect and share traffic information by using those smart devices instead of using infrastructure sensors. Various applications or services for traffic safety and the convenience services based on collecting and sharing traffic information by using smart devices have been developed. WEVING (WE are driVING together) is a social driver assistance system with a smartphone application that automatically detects traffic events (i.e., delays, congestion, accidents, road conditions, etc.,) using cameras, GPS (Global Positioning System), gyroscope sensors, and the acceleration sensors mounted in smartphones. The detected traffic events, event images, and current locations are shared with users in social groups via WEVING. If there are many vehicles that use the WEVING service, and frequent attempts are made at detecting the current location, a large workload for the WEVING server is created when assisting in the sharing of vehicle locations, traffic events, and images between social groups. In particular, sharing the locations of surrounding vehicles and traffic events in real time is very important, given that delaying processing because of server overload might make such sharing of current locations and traffic events meaningless. In addition, traffic events detected in areas of heavy road traffic are likely to be duplicated.

In this project we focus on both climatic conditions(weather) as well as the traffic of a particular region so that the traveller gets an indication about the weather and traffic status of that particular region, so that he can take a shortcut to reach his destination earlier to save his time of travel.

II.RELATED WORK

URBAN computing connects urban sensing, data management, data analytic and service providing into a recurrent process for an unobtrusive and continuous improvement of people's lives, city operation systems and the environment. In particular, many works have been done to investigate the impact of inclement weather to traffic. But the **Investigation** has been done separately for traffic and weather. Since the investigation has been done separately for weather and traffic , the user cannot predict the weather and traffic of aparticular region as both the weather and traffic conditions of all regions varies from time to time based on the road structure ,population density and the negative impacts of the

pollution caused by the transport systems. Here the user gets indication of the weather and traffic condition changes one at a time i.e either about traffic or weather at a time. So in our proposed work we try to overcome this problem by bringing both weather and traffic together into one single desktop application. So the user gets indication of the weather as well as the traffic condition changes at a time in one single application.

III.PROPOSED WORK

The aim is to solve a variety of emerging city problems, such as traffic congestion, energy consumption, and pollution, based on the data of traffic flow, human mobility, and geographical data, etc. In particular, many works have been done to investigate the impact of inclement weather to traffic. For example, a heavy rain may slow down the traffic and cause congestions due to low visibility and high demand of vehicles; the decreasing temperature in very cold days will freeze the roads and influence the transport performance, etc.So here the investigation for both weather as well as traffic is done together and is brought up as one single desktop application so the traveller gets indication of the weather and traffic condition changes at same time so he can take shortcuts to reach his destination earlier and also save his expenditure as well as his time of travel. In the proposed work we have the following modules:

Sign in& Sign up

A. Weather report generation
B. Map
C. Graph.

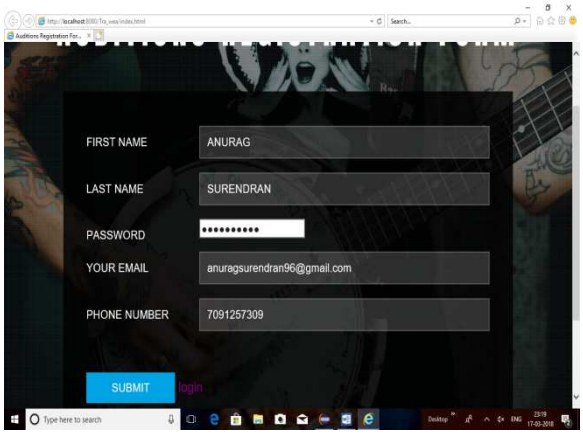
1.Sign in and Sign up

This module is used to enter the user or admin password. In the registration form the user needs to enter his firstname ,lastname,password and his contact number only if his password is correct then the login page opens up and the user needs to enter his username and password correctly only if username is valid and the correct password should be entered then only user willbe able to sign in and login form opens .

2.Weather report generation

In this module the main purpose is to retrieve the forecast.After signing in the Tra-weather report generation page opens up here type any particular location choose any option like main descrption, degree and wind speed, temperature and pressure of that particular location is generated.In this page we can select map option to view the traffic of that location.The user must choose the particular location to travel based on which he comes to know about the present temperatue, degree, pressure below the sea level which is defined.Fog computing one of the type or discipline of cloud computing is used to retrieve the forecast. Also the variation of the temperature in various regions can also been known to the user to satisfy the journey requirements of the travellerOnly if the user enter his details in the registeration form and click the submit button then the login page opens or else it shows an error ,similarly only if the correct username and password must be entered so that the Tra- weather page opens to show the weather details and only if this page opens up then only the user can check the traffic status as well as use the graph option to know the variation of the traffic rate from place to place and from time to time as the traffic rate varies form place to place and based on the time variation.

So Fog computing is an efficent tool or method used for weather forecasting in case of the project.



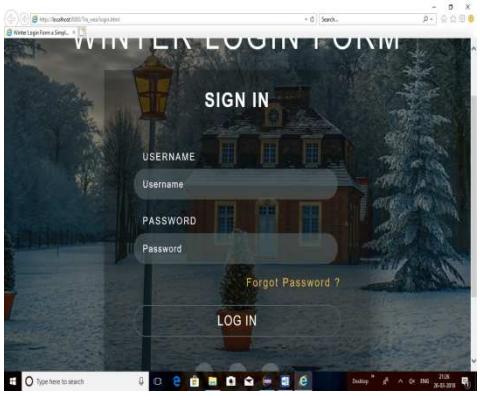


Figure 3.1 depicts registration form for sign up – enter the details and click submit button.
Login form for sign in – enter the details and click log in

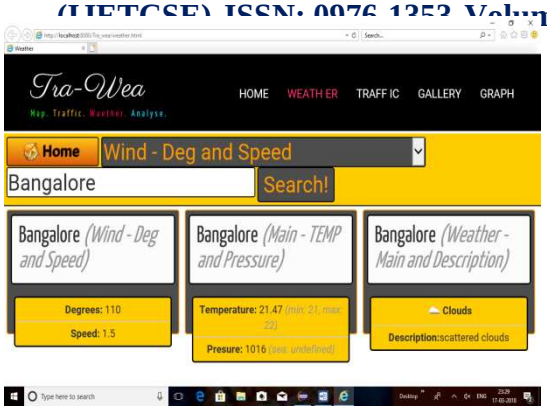


Figure 3.2 depicts weather report generation for a particular location .

3 Map

This module is used to identify and gives indication of the traffic condition of any current location that the user choose. Traffic indication is given by three colours red,yellow,green.Also this map is useful for the traveller in many ways like he can locate naerby restaurants, workshops, busroutes, trian routes, bus depots ,railway stations and petrol refilling stations etc.

3.1 Traffic Indication :

RED- indicates high traffic of current location.

YELLOW- indicates moderate traffic of any location.

GREEN -indicates less traffic of location.

The traffic indication is given based on our current traffic system as red means heavely traffic region, yellow means moderate traffic condition and green means the particular region is free of traffic and is suitable for the traveller to take up this route to save his time of travel, but also all regions there will varition in the traffic status based on time variation so the traffic rate of any region varies based on different time variations.

This is map is entirely different from other maps it can be considered as a route map by the user as well as know the traffic status of any particular region ,during anytime user wants to know during his time of travel.

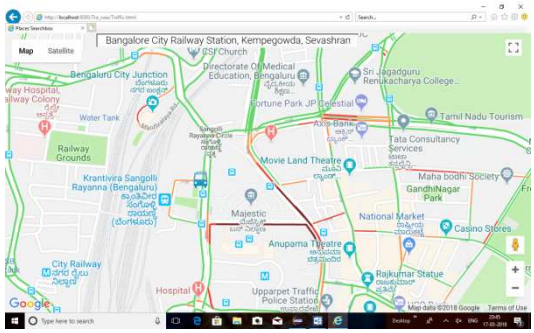


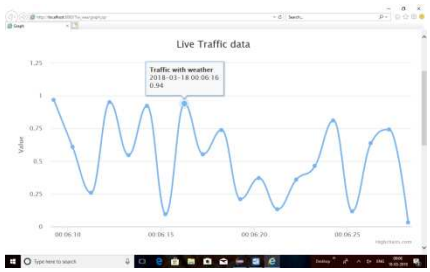
Figure 3.3 depicts the traffic indication of any location the traveller choose–route map with traffic status

3.4 Graph

This module is used to dynamically predict the traffic and weather report as then traffic rate of any location varies from time to time as well as based on the road structutre and population density and the negative impacts of pollution caused. This graph dynamically shows traffic rate of any location basedon the current day and along with the time. So this graph dynamically shows the variation in traffic rate of any location as the time keeps on varying. The traffic rate either increases or decrease based on the time variation.

The prediction cannot be made by us correctly as the traffic rate keeps on changing every fraction of a second As the time varies . So the graph dynamically predicts and shows the traffic rate changes based on the variation on time as we can clearly understand from the graph thatthe traffic rate of any particular region the user chosses varies based on the time variation as the traffic rate of different place may vary at different time based on the traffic rate variation and the time variation.

Figure 3.4.1depicts the rate of traffic changes based on Time variations.



From the above graph shows varition of the traffic rate of particular region based on the time variation and figure below shows the dymamic change of the traffic rate of the same region based on the time variation and graph is used to study the dynamic change of traffic rate based on the time variation.

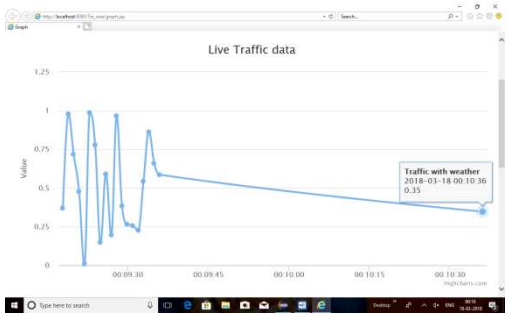


Figure 3.4.2 depicts that the traffic rate has dynamically changed based on the current location as well as the Time variation.

4. APPLICATIONS OF WEATHER FORECASTING AND TRAFFIC MONITORING.

4.1 Applications Of Weather Forecasting

- Fog computing.
- Organic computing.

- Hazardous weather in small scale(daytime& night).
- Forecasting of Tropical cyclones and hurricanes.

4.2 Applications Of Traffic Monitoring

- Survey road networks.
- Number plate recognition.
- Vehicle tracking.

5. PROBLEM IDENTIFICATION

In the existing system there is a major drawback investication for weather and traffic has been done separately.As the weather and traffic of any region varies from time to time and as human beings we cannot predict these weather as well as the traffic changes of any region.So in existing system the needs and requirements of the traveller is not met i.e traveller does not get clear information about weather and traffic changes at the same time.

6. OBJECTIVE

Functional characteristics of various urban regions throughout a city, namely, (i) how to identify regional weather-traffic sensitivity index throughout a city, that indicates the degree to which the region traffic in a city is impacted by weather changes; (ii) among complex regional features, such as road structure and population density, how to dissect the most influential regional features that drive the urban region traffic to be more vulnerable to weather changes. However, these two questions are nontrivial to answer, because urban traffic changes dynamically over time and is essentially affected by many other factors, which may dominate the overall impact. We make the first study on these questions, by developing a weather-traffic index (WTI) system. The system includes two main components: weather-traffic index establishment and key factor analysis. Using the proposed system, we conducted comprehensive empirical study in Shanghai, and the weather-traffic indices extracted have been validated to be surprisingly consistent with real world observations. Further regional key factor yields interesting results. For example, house age has significant impact on the weather-traffic index, which sheds light on future urban planning and reconstruction.

7.CONCLUSION

In this paper, we analyzed and studied the factors like road structure and population density of certain urban regions, so we come to know about how transport(human mobility is affected due to the impact of weather changes and traffic of that particular region.Also as human beings we cannot correctly predict both weather as well as traffic condition of any particular region as they vary from time to time as wellas the traffic rate of any location varies from time to time and place to place.

So we come to the conclusion that to create one single desktop application using Weather Traffic Sensitivity Index(WTSI) and based on the key factor analysis done i.e both weather as well as taffic analysis is done in one single appliation so that the traveller gets information about weather and traffic status at the same time,so he can take shortcuts to reach his destination earlier to save his expenditure also save his time of travel.

8. SCOPE OF THE PROJECT

The main scope of this project is to monitor the live traffic data throughout the city or the location which the traveller chooses to know about the current traffic status. Also to monitor the live forecast and to generate the weather report, the technique used for this purpose is Weather Traffic Sensitivity Index(WTSI) and based on the key factor anaylsis done to know the change in weather and traffic status based on Time variation. Finally to monitor the degree to which the regional traffic in a city is impacted by the weather changes and the pollution caused by transport.

9. REFERENCES

[1] H. Li, Y. Lee, B. Kim, D. Choi, I. Bae, S. Song, M. Yeo and R. Oh, “WEAVING : social driving assistant system,” In Proceedings of ISITC, (2014).

[2] M. Zaharia, M. Chowdhury, M. J. Franklin, S. Shenker, and I. Stoica, “Spark: cluster computing with working set”, Proceedings of the 2nd USENIX conference on Hot topics in cloud computing, (2010), pp. 10-10.

[3] M. Zaharia, T. Das, H. Li, S. Shenker and I. Stoica, “Discretized streams: an efficient and fault-tolerant model for stream processing on large cluster”, Proceedings of the 4th USENIX conference on Hot Topics in Cloud Ccomputing, (2012), pp. 10-10.

[4] X. Xiong, M. F. Mokbel, and W. G. Aref, “Lugrid: update-tolerant grid-based indexing for moving objects,” In Proceedings of MDM, (2006), pp. 13-24.

[5] H. Li, Y. Lee and S. Song, “Grid based Distributed In-memory Indexing for Moving Objects”, In Proceedings of ISITC, (2014).

[6] J. Dean and S. Ghemawat, “MapReduce: simplified data processing on large clusters”, Communications of the ACM, (2008), pp. 107-113. [8] http://mntg.cs.umn.edu/tg