QoS- unbroken traffic lane streaming in Road network

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Abstract— At present situation travel becomes the biggest hassle for everyone. In this proposed research paper I have used GPS system to find out the shortest path to make your travel at ease. Through this navigation process it is clear-cut for us to find out right path. In this process, it is possible for an individual to analyse the exact shortest route from multiple paths. With the information from the satellite it depicts the image of the route for the travel. Besides it bestows the time and speed for us. If an individual is planning to travel from one node to another node it requires the information for one to decide to analyse the routes to reach the destination without any difficulty. By using our proposed system one is facing any problem while travelling in certain route it is easy for the particular individual to analyse the route map information precisely so that it makes the person to reach the any place within devastate their time they can reach with no trouble. This advanced system which facilitates to understand the route links which gives clear information about the instantaneous routes which makes you to trip in the future without any difficulties.

Keywords- Path Recognition, Colour Space, Edge Detection, traffic streaming.

I. INTRODUCTION

In this research paper I have used GPS system as an important device to project the images of the different paths which makes you to ease travel at every level. An individual would prefer to travel from one destination to another destination there are different paths available for a single destination. Through our navigation process a person can easily trace out the shortest path for a travel to manage the time effectively. Firstly, it will project the images of the standard paths to make your travel plan so that it will trouble free for one to compose their travel better. The main objective of our research process is from the standard paths it will guide us to get the image of the right paths for our travel and also it makes us to get the multiple graphic images of the route map to make our travel at ease by managing the time and speed of reach the certain place. The images of the different routes can be identified with the different colours and information will be given efficiently through the satellite. In this paper, for image classification and image mining is most essential. For that the proposed system use hybrid EDGE extraction algorithm.

II. EDGE EXTRACTION

A. Hybrid EDGE extraction algorithm

The Image Acquisition from the Google Earth satellite images are used in this project that can present medium-high resolution imagery greater than 1-meter per pixel. Road Regions Extraction depicts the elements can be found in a colour satellite image, however, it had been classified into five categories. These five general elements can be found in a high-resolution satellite image, namely: bushes or trees, Roads, buildings, sandy region and water regions, as shown in Figure 2. The characteristics of these elements are studied and examined. In Figure 2, humans can easily differentiate these five elements with their naked eyes since all these elements are different from each other by their colour and luminance. For the purpose to let the computers have the same ability, they are trained to analyse the colour space components of the satellite image.

B. EDGE Detection

The images received from the Road extraction system based only on the colour space components may not be perfect. This is due to constant changes of the road’s colour while being shaded by trees or buildings. Some shaded road segments which luminance value is lower.

C. Determining the Traffic Network

Road extraction results obtained after the elimination and segmentation processes are combined with the edge detection which results to determine the actual road network. Based on the assumption, that connectivity exists between the roads that form a road network, the largest regions can be considered as road regions. As a result, a simple calculation on the total pixels is made to verify and select the largest connected regions in the result images.

D. Algorithm Process

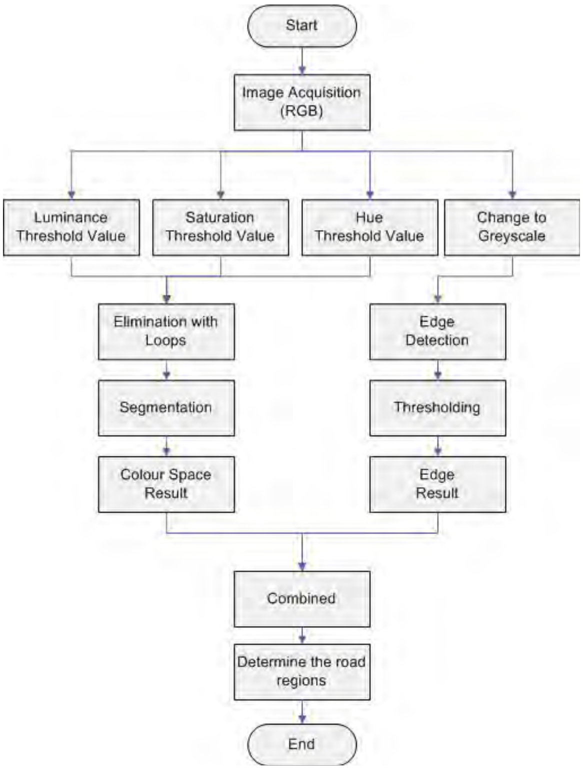

Figure 1: Hybrid Edge extraction algorithm

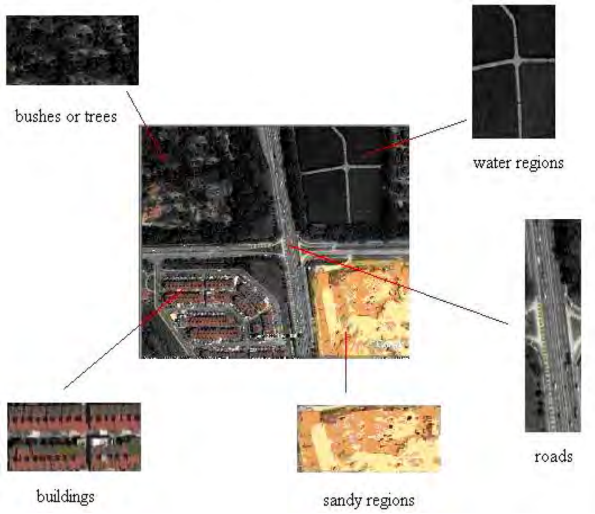

Figure 2: Elements of satellite images

Picture 3.1, S indicates source, D indicates the Destination and in between S to D n-number of nodes available, the dotted line indicates the routes by node by node. We cannot able to cross the line (Edge Road), and our system also deduct dead end of the road. Through the present system the GPS navigate a path for given S and D. If an individual is planning to travel in a path he/she faces any inconvenience during the travel by the traffic or other issues through our system he/she can easily understand and plan the travel in an effective way. Some of methods are there already but still we cannot solve this problem, in this research paper, a new concept proposed by some experiments. it will increase the QOS. By this one can get the route maps through node by node it will guide an individual to make the travel in a possible and effective way.

E. Result and Analysis

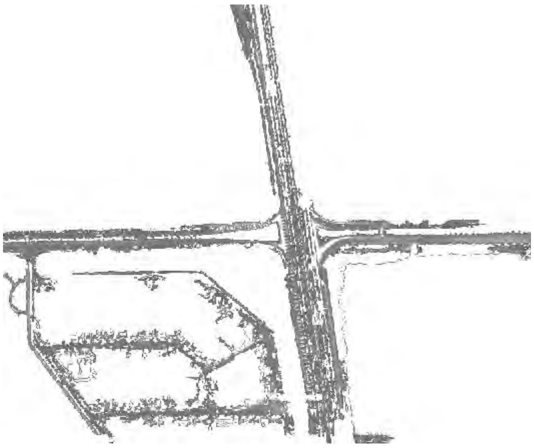

Figure 2.1 (a) Using edge detection

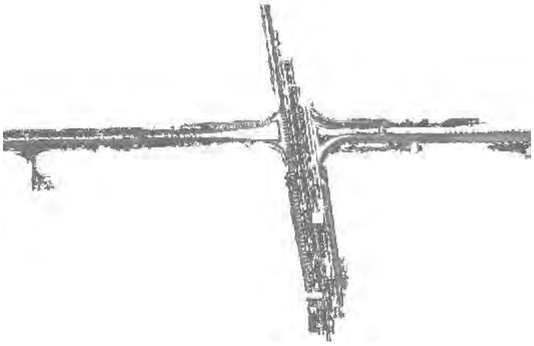

Figure 2.1 (b) Without using edge detection

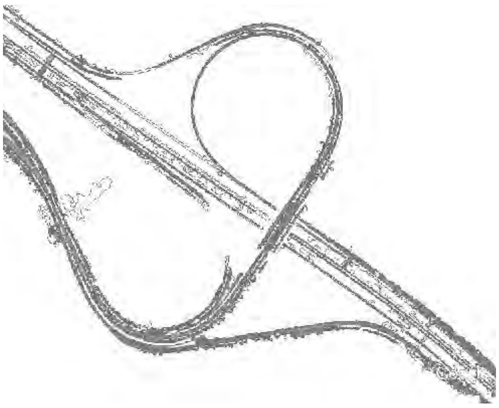

Figure 2.2 (a) Using edge detection

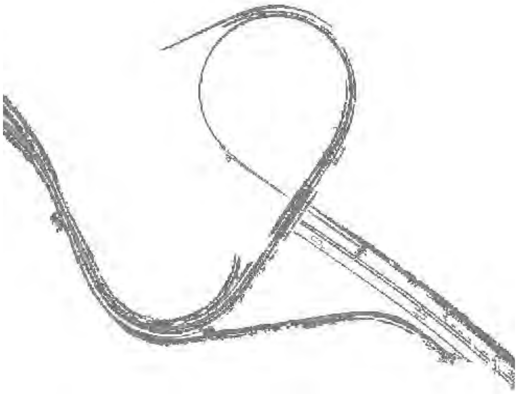

Figure 2.2 (b)Without using edge detection

Reconnect curved regions

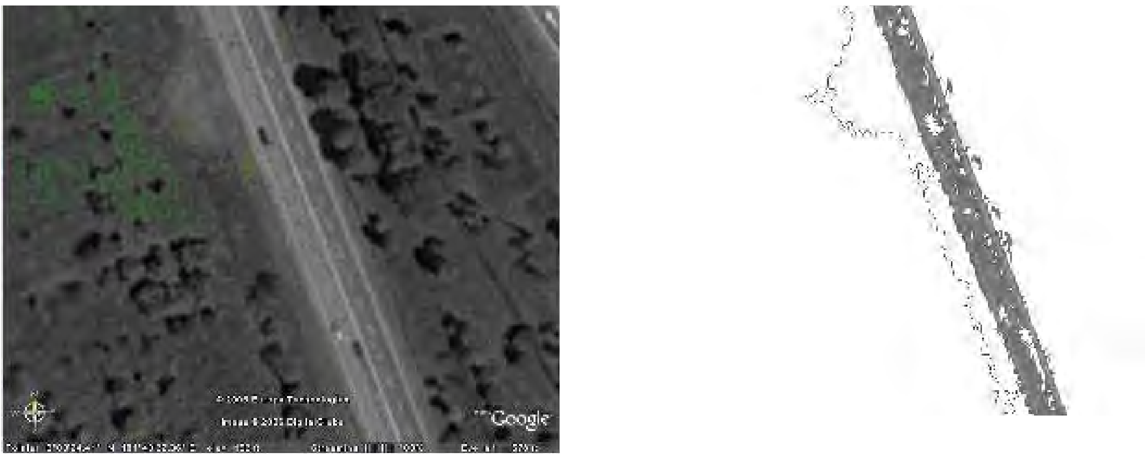

Figure 2.3 Extraction for a straight road

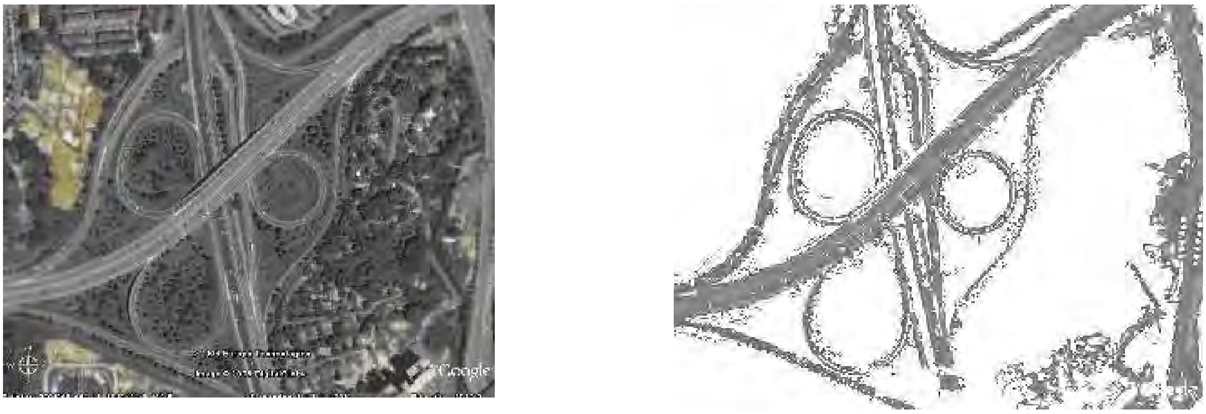

Figure 2.4 Extraction for a small scale complex road

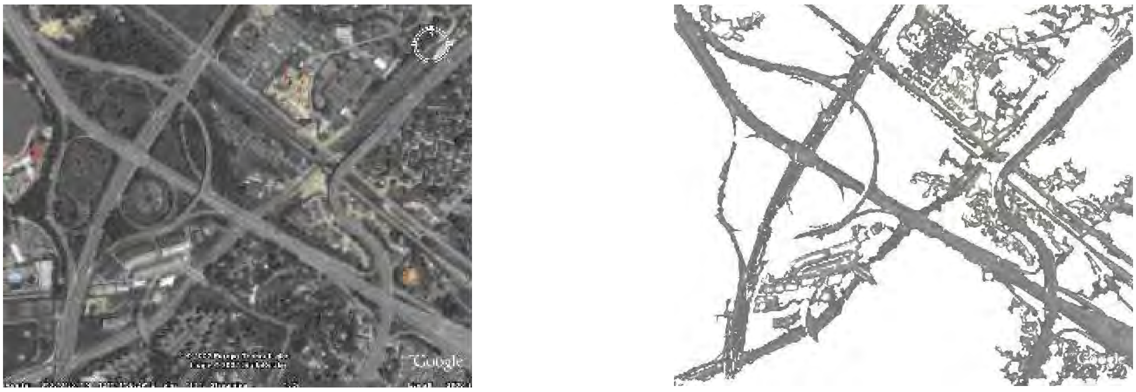

Figure 2.5 Extraction for a medium scale complex road

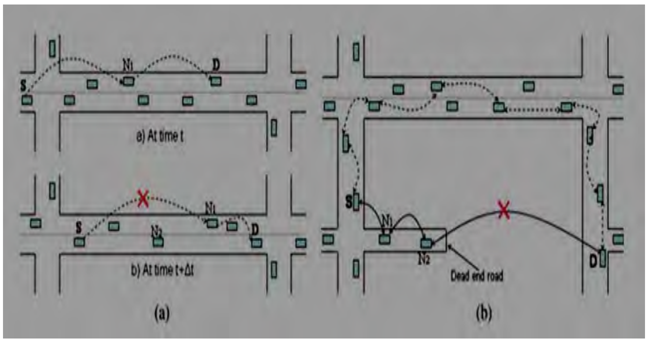

Figure 3.1: S-D Path Navigation

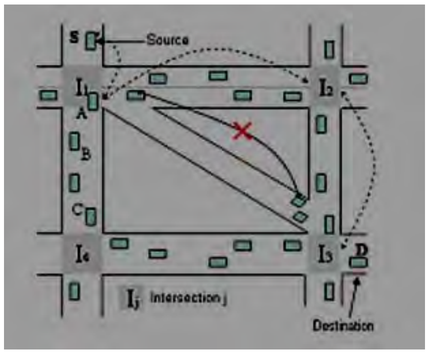

Figure 3.2: S-D Path Navigation

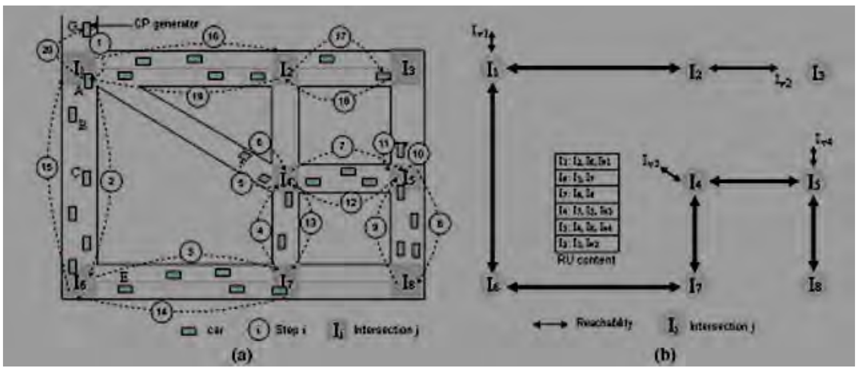

Figure 3.3: S-D Path Navigation

III. PROPOSED PROCESS

Step 1: The shortest path is determined by using Dijkstra Algorithm. By this algorithm the possible two or more shortest path is determined to reach destination from the source. It shows in the Fig. 3.3.

Step 2: If S to D is true Next

Create passable paths

Next (Our GPS System) users will get the navigation path for their S-D.

Next S to D (km/h) calculated by node by node

for first-third End Nest if the user will get trouble in any node will be noted by time period

Step 3: Next Previous Predicted path will change by Discriminative pattern mining analysis

Step 4: The present and past history will analysis for problematic node and path. And get the good result.

IV. METHODOLOGIES ALONG WITH OUTCOME

The In this section, two approaches are given for road traffic path estimation and prediction. The support vector method can be used to approximate a function f(x) in terms of a linear combination of a finite number of basic functions. When road link 1 and road link 2 merges into road link 3, the traffic flow rates of the three road links satisfy q3 (t) = q1 (t) + q2 (t). With this description, we can “learn” the relationship between traffic speed and traffic flow rate, estimate the latent flow rates, and predict future speed and flow rate on different road links. We used a data driven non-parametric approach (support vector kernel) to estimate road traffic speeds. Short term traffic speed prediction and the travel time prediction for vehicles on a road segment is based on the tracking records before the time of the predictions. To assess the performance of our non- parametric approach to predict the travel time through a road segment, we randomly separated out the tracking data for 25% of the delivery vehicles for validation. The average relative error for highway travel time prediction is 14%, and more than 95% predictions have less than 20% relative errors.

In comparison, the travel time prediction based on road average speeds is 22%, and 30% of the predictions have more than 20% relative errors. The support vector method improves the travel time prediction by finding the “abnormal” points — the points (t_i, x_i) whose speeds deviate from the expected ones (which can be roughly treated as the prior derived from historical data) by a value $\Delta v_{ti,xi}$ greater than the given threshold and expressing the speed correction

$\Delta v(t, x) = \sum_{i=1}^{n} \alpha_i . \Delta_{vxi,ti} \cdot \exp(-\sigma \sqrt{(X - X_i)^2 + (t - t_i)^2}$ (which is added to the prior speed to give the estimated instantaneous traffic speed) as a linear combination of the $\Delta vt_i,x_i$ ’s corresponding to those abnormal points. Since The kernel $K((x, t), (x_i, t_i)) = \exp(-\sigma \sqrt{(X - X_i)^2 + (t - t_i)^2}$ decreases exponentially fast when the point of speed estimation (t, x) goes away from the sample point (t_i, x_i), the influence of $\Delta vt_i,x_i$ quickly becomes negligible with increasing distance between (t, x) and (t_i, x_i). We set _ to be 10%, and choose C and σ by 3-fold cross-validation.

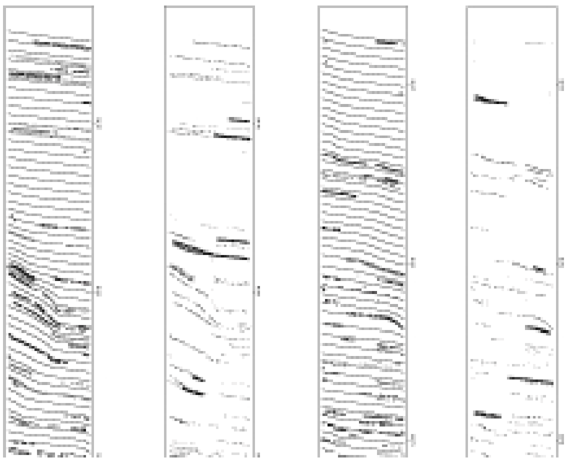

Figure 4: Road and its lanes

This figure 4 is representative of the results for other roads and on other days according to our experiments. In the four plots, the axes going horizontally and vertically are respectively hour-of-day and location-of-road (from 0 kilometer to 15 kilometers). Plot one and plot three from top to bottom visualizes the results of estimating the traffic speeds on road RL1 and RL2 respectively. In the two plots, the colored points correspond to the tracking records, and different colors represent different vehicles. The solid lines represent the estimated tracks of imaginary vehicles that go from location 0 to location 15-kilometers of the roads, starting from different times of the day. Plot two and plot four visualize the results of predicting travel times from known tracking records on road RL1 and RL2 respectively. In the two plots, the dotted lines correspond to the tracking records used for traffic speed estimation. The points that are not blue represent the tracks to be estimated, and different colors represent different vehicles. The blue points represent the predicted tracks for those vehicles. As evidenced by the four plots, better estimation of traffic speed and prediction of travel time are possible because the tracking records provide evidence of instantaneous traffic speeds.

Traffic speed estimation based on the above nonparametric approach works by considering nearby vehicle speed abnormalities. Predicting traffic speed abnormality in advance is a harder problem since we need to "learn" a functional rather than a function, $V : v(i, x, t') \cdot 1_{t'<t} \rightarrow v_{j,y}(t+\Delta t)$. Specifically, we are given the traffic speed at different locations x of different road segments i up to time t, (which is a function of x, i and t'¡t respectively), and we are required to estimate the speed at location y of road j at a future time t+Δt. This functional is non-linear since $V(\alpha v1+\beta v2) \neq \alpha V(v1)+\beta V(v2)$ generally. While the functional can be estimated with support vector methods in a model-driven parametric approach, and we can use our knowledge on the traffic flow theory to assess the performance of any (blind) data-driven non-parametric approach, we will give below a dynamic Bayesian network approach, since the latter is much simpler. We can represent the road network by a directed graph {V, E} where V is the set of road links and E is the set of transitions from one road link to another road link. For each road link i ∈ V, its traffic flow rate is $\min(\sum_{(j,i)\in E} q_j(t),\ q_i^{max}(t)) + g_i(t)$ where $q_i^{max}(t)$ is the maximum flow rate of road link i, and $g_i(t)$ is the traffic flow generated at sample time t. Both $q_i^{max}(t)$ and $g_i(t)$ is an (unknown) periodic function. The traffic speed at road link i has Gaussian distribution around a non-linear function $v_i(t) = N(v_i(q_i(t)), \sigma_i^2(t))$, where v and q satisfies the fundamental diagram approximation. Our goal is to learn the parameters g_i, k_i^{max} and v_i^{max}, and to estimate $q_i(t)$. we can predict traffic jams half an hour to two hours on highways. We note that the further ahead in time we predict, the more information and computation we need, and the traffic conditions of the less number of places we can predict with required precision based on limited amount of information. Since the further we look into the future, the more uncertainty is going to add into our computation.

V. Conclusion

Finally this system formulates an individual to make his/her travel in securable mode. A person is capable to receive the up-to-the-minute information about the route map from the satellite. This process which channels the everyone to acquire the route graphs about their travelling from node by node. Besides it produces the problematic issues in and around the route maps so that it will be versatile to the person to make their travel plan with the better prospect. In this competitive world travelling in the land way is the biggest hassle through our GPS system it provides the images depict the shortest and right route path for the travel by reaching with stipulated time and constant speed

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