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Designing a Model on Smart Traffic Control System

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Abstract: ***Lots of Traffic Congestion during office hours or some special Occasion also during heavy traffic usually results in uncertainty and dispute, auto crashes, waste of time and resources, and release more carbon into the ecosystem so to avoid heavy traffic jams and to avoid them to wait on signal. Proposed idea will be given more advantage to reduce waiting time on the signals and vehicle will be easily pass with the help of speed management notification on on Digital Gadget. Each vehicle is furnished with RFID and with the help of distance sensor location of vehicle signal system can easily detected and system will provide notification to a person who drives a vehicle on their mobile phone or Digital gadget, according to that person will manage the speed of the vehicle to reduce waiting time on signals with the help of this system. It reduces everyday congestion, by regulating traffic flows and prioritizing traffic to demand in running time. Reducing the pollution throughout the urban area and polluting also in our system if the traffic density is more or if there is a traffic jam, then we would be uploading the status on the GPS which would indicate that there is a traffic jam at a particular signal. Prevent Maximum amount of traffic flow & can prevent traffic congestions. Real time measurement of speed of vehicle to control the traffic congestion is possible through image processing. Huge amount of processing algorithms are present to detect the speed of vehicle.by using image processing algorithm we easily detect the number of vehicle and speed and motion of particular vehicle.***

Keywords: ***Routing Optimization, Thermal Camera, RFID.***

I. INTRODUCTION

Traffic congestion is a big problem in many urban cities of the world. The problem is particularly present in developing countries. In recent days scenario, this is a very important feature [3][1], especially for urban cities environments. Some systems require manual control which consist extend for human error. RFID tags consist long range, no line of vision requirement, and can with stand cruel environments and can track objects in real time. RFID [6] tags are used to detect vehicles and activate the traffic control and mange protocol.

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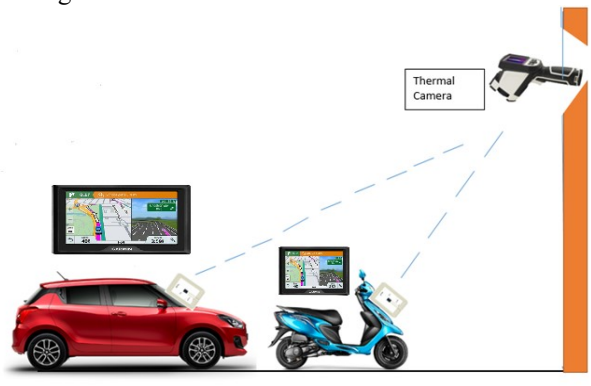
Traffic surround is a major problem in developed cities. In Proposed idea on signal each signal furnished with Infrared thermal Camera they were captured the images of Vehicle motion and number of vehicle present in each road to avoid deadlock.

After that in each 10km distance beam is present. From one beam to another beam 10 km distance beam are present. On beam one camera and sensor present. Sensor senses RFID tags present on car number plate. Also, threshold value from signal should be calculated and by using ultrasonic sensors and infrared camera location of vehicle detected. So now we Provide the notification of speed to the person who drive vehicle on his mobile or GPS system digital gadget. Waiting Time on the signal reduces and vehicle will be easily passed with the help of speed management notification. My present investigation idea belongs to urban area development to develop Nasik city as smart city. The demands of the service of Internet and personal communication gadget devices such as mobile phones, pagers and wireless phones have resulted in drastically changed communication satellite technologies. Vehicle with RFID Tags on the roof of vehicle can be easily detected by using this technology. Wireless Communication, Mobile computing [11][12], Road Map through Bhuvan App, Data Capture by Camera. Remote Sensing Technology is the knowledge of information about a particular object or phenomenon without making physical contact with the object and thus in contrast to real time observation, especially the Earth. in my project by using remote sensing technology vehicle position can be easily detected. In future instead of thermal camera we can also use Lens less-camera based machine learning for image classification. We used a variety of learning methods to train the model. Algorithms used for the training decision tree, k-nearest neighbors (KNN).and their variants, also learning algorithm and Motion Detection genetic algorithm in AI. One trained, each trained model is measured for accurate using set number of test images.

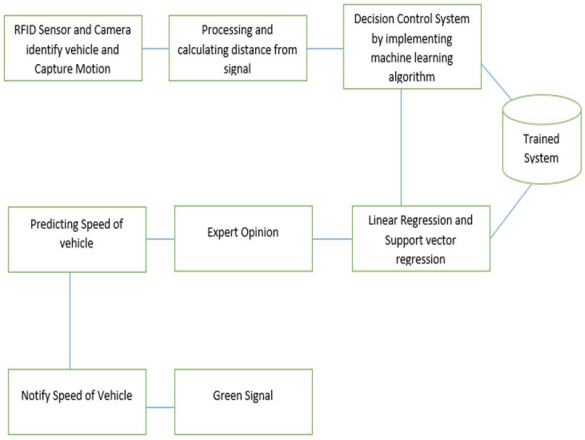


II. LITERATURE REVIEW

Traffic congestion is major issues in day to day life because of traffic congestion lot many fuels wasted, also pollution increase day by day to avoid theses problem traffic solution is needed. As per this Techniques I placed RFID Senor on vehicle which I used An OBU consisting of a sticker-type RFID tag that requires no power source.RFID readers installed in tollgates read the identification information of the RFID tag placed to the windshield of a vehicle and charges the user through the bank account associated with the identification information. The function of the RFID tag is limited to the identification of the vehicle, and it cannot announce the paid toll or a record of the payment history. Due to the low cost of RFID tags, however, this type has attracted attention recently in emerging countries such as those in Asia and Latin America.RFID tag All of the types are available in order to achieve various toll collection demands around the world. This paper describes our efforts toward the development and practical application of a toll collection system using RFID communication technologies. GDSM is an advanced of the DSM model with the use of a genetic algorithm (GA). In this method follow two steps to reduce noise. They are useful for creating the saliency map (SM), a weighted center-surround difference (CSD). The Gaussian noise around particle and object, generated by the monotonous image resizing in the Gaussian Pyramid, it minimizes the object detection performance. The sizes of the moving objects are bigger the real sizes. In this paper, the weights of CSD are optimized by using GA to get more tight object regions. GA starts by a population of randomly initialized weights that are being optimized with the lower and upper bounds, which are zero and one, respectively. The average error of moving object detection in all training images is calculated based on the flap ratio, and used in calculating the fitness function based on below equation. The overlap ratio is calculated by the ratio of the intersection area to the union area of the hand-labeled ground truth. vehicle signal system can easily detect and system will provide notification to a person who drives a vehicle on their mobile phone or Digital gadget, according to that person will manage the speed of the vehicle to reduce waiting time on signals with the help of this system. It reduces daily congestion markedly, by smoothing traffic flows of urban area and preferably traffic in response to demand in real time. Reduce pollution throughout the cities. stop-start driving is not proper and polluting also in our system if the traffic density is more or if there is a traffic jam, then we would be uploading the status on the GPS which would indicate that there is a traffic jam at a particular signal. Capacity and traffic flow and can prevent traffic congestions. Real time. **Decision tree learning** predictive modeling go from monitoring about an item data to conclusions about the item's target value. Here for the speed calculation from the signal user reach to the signal on particular time we need decision tree machine learning algorithm. **Motion Detection Algorithm:** By using a Genetic Algorithm moving objects detection for Real-time traffic observation also provide smart dynamic analysis to fast moving object by calculating the pixel image found by using GDSM(Genetic Dynamic Salience Map and DSM (Dynamic Salience Map).this algorithm help us to avoid deadlock condition to detect the actual speed of vehicle.[7]

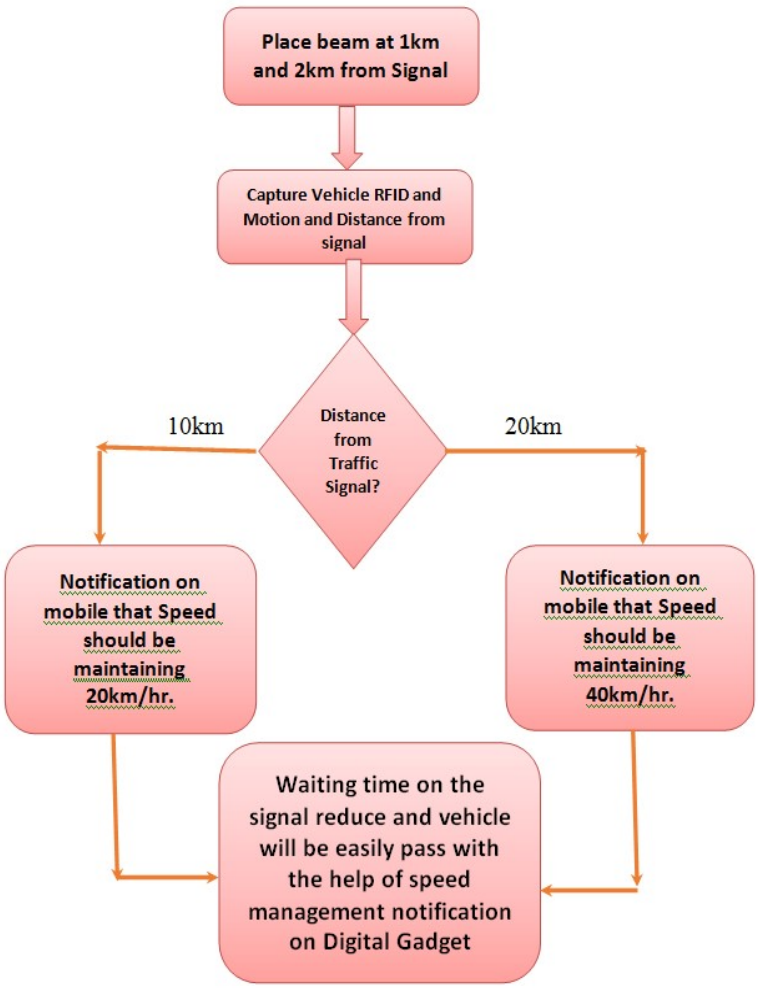
III. PROPOSED METHODOLOGY

Block Diagram



Procedure:

1. Placed beam in between 1 km and 2 km from the Signal
2. Capture Car Path, status, distance from signal with help of camera, sensors and stored it on database Capture the vehicle speed by various image processing algorithm calculate the speed of vehicle .
3. If vehicle within 1KM or 2KM from signal
4. Provide Notification of Speed on Digital Gadget of the person who drive vehicle to avoid waiting Time on Signal
5. According to that Person who drive vehicle will manage his speed.



3.1 FLOWCHART

Algorithm

K-Nearest Neighbor Algorithm consist set of input images by using this classifier capable of a find the Euclidean distance between images

One of useful supervised based learning and anon-parametric techniques is K-Nearest Neighbor or KNN algorithm. KNN is a wide applied method used as a classifier and regression in different field such as image processing, data mining, pattern recognition and other applications. The output result of the algorithm depends on K- nearest neighbor category which implemented by finding K- number of training points closest to the required character and consider the votes among the K object. The algorithm is very easy. However, is useful of learning more-complex non-linear decision boundary and regression functions. The intuition of KNN that same instances should have same class labels (in classification) or same target values (regression). On the downside, the algorithm is computationally expensive, and is prone to overfitting.

$$\text{Euclidean}=\sqrt{\sum_{i=1}^{K}(\mathrm{X\,i}-\mathrm{Y\,i})2}$$

$$\text{Manhatten}=\sum_{i=1}^{k}|Xi-Yi|$$

$$\text{Minkowsi}=\left(\sum_{i=1}^{k}|Xi-Yi|q\right)1/q$$

Decision tree learning predictive modeling go from monitoring about an item data to conclusions about the item's target value. Here for the speed calculation from the signal user reach to the signal on particular time we need decision tree machine learning algorithm.

Distance from the Signal	Speed
10m	Manage 20km/hr
20m	Manage 30km/hr
30m	Manage 40km/hr
40m	Manage 50km/hr

Motion Detection Algorithm: By using a Genetic Algorithm moving objects detection for Real-time traffic observation also provide smart dynamic analysis to fast moving object by calculating the pixel image found by using GDSM(Genetic Dynamic Salience Map and DSM (Dynamic Salience Map).this algorithm help us to avoid deadlock condition to detect the actual speed of vehicle.[7]

Camera	Approx.Min Recognition Distance(m)	Approx.Min Recognition Distance(m)	Scene
Thermal Camera	15	50	Road traffic

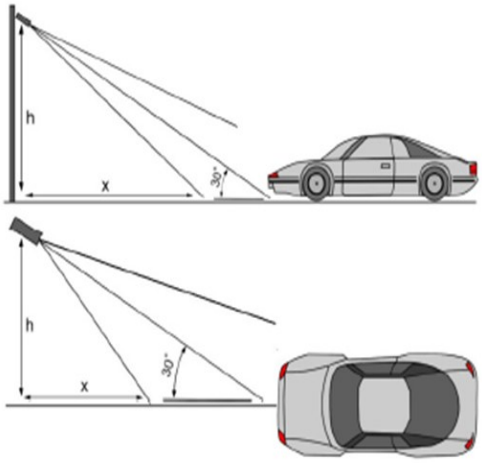
Fitness function =E (1-overlap_ratio)

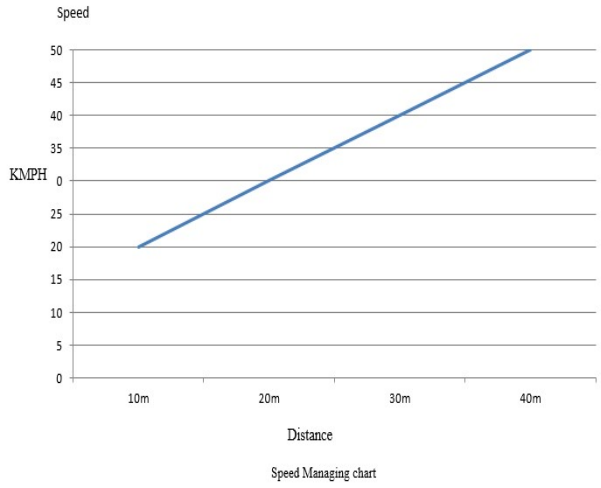
Overlap ratio= A $T \cap D$ **/ A** $T \cup D$ **= AC / AT +AD-AC**

IV. RESULT ANALYSIS

VEHICLE DETECTION

Simulation Model





V. CONCLUSION

The purpose of this paper by using this technology user can easily avoid heavy traffic jams and to avoid them to wait on signal. Proposed idea will be given more advantage to reduce waiting time on the signals and vehicle will be easily pass with the help of speed management notification on Digital Gadget. It's a step towards our country become smart country.

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