A Review on Motorway Traffic Clogging System
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Abstract— As we know the population of metropolitan is growing every day. With increasing country population, amount of vehicles is also rising, and this direct enchases traffic of cities which should be manages as early as possible without any loss people. Traffic causes accidents which directly affect an individual life. In the last 10 years the situation has get worse due to quick growth of automobiles and inadequate highways to accommodate them. This work describes methods of real time area based traffic by means of image processing for intelligent traffic control system.

Key words: Traffic Engineering, Video Processing, Image Processing, Tracking, Safety

I. INTRODUCTION

The vehicles have brought independence, flexibility and mobility to numerous citizens but increasing demand of vehicles cause traffic which lead to accident. Quick transportation is the source of mismanagement development and which lead to traffic congestion which results in long waiting times, loss of fuel and money. It is therefore utmost necessary to reduce number of vehicles on road. Traffic congestion is a difficulty problem of city development, faced by any metropolitan area, and how to improve that difficulty in the existing traffic situation has the central practical implication and manage traffic of city is flattering a major dilemma in numerous countries. There are two parameters for the traffic congestion the first is the limitation of transport power of road network, and the other is the lack of knowledge about traffic rules. Without this, drivers can only select path according to their knowledge and perception, but not the optimal one.

Traffic management at road is essential to diminish waiting and travelling intervals, save energy and currency. The objective of intelligent traffic management systems is to achieve developments security and efficiency of the transport system through integrated application of advanced monitoring, communication, display and control process technologies both in the vehicle and on the road [2]. Road traffic management facing problem like rule ignorance which lead to traffic congestion throughout the world. The development of roads infrastructure is not the final key to reduce traffic congestion. It needs some smooth and smart arrangement that contracts with the difficulties in the current traffic monitoring system.

Traffic blocking has a number of negative impacts [11]:
- It reduces the regional economic health.
- Delays, in service, conferences, and schooling, resulting in lost business.
- Wasted fuel increasing air pollution and carbon dioxide emissions owing to increased idling, acceleration and braking.
- Stressed and frustrated motorists, encouraging road rage and reduced health of drivers.
- Blocked situation for people who are in emergency.
- Greater chance of accident due to close-fitting spacing and continuous stopping and going.
- Increased numbers of vehicles in the lane cause pollution.
- Improper parking and no road maintenance cause accident and collision.

II. PROBLEM DEFINITION

Traffic jamming is not mainly a difficult, but mobility problem is also one of the issues of clogging, which means large amount of people wants to travel at the same time each day. No proper arrangement among the vehicles at the traffic. Speed of vehicles cause jam in many cases. People with less knowledge of rule are not able to handle traffic and cause accident which lead to clogging. Poor driving knowledge also lead to accident which cause congestion.

III. LITERATURE REVIEW

This section gives a short description of existing system with various parameters in traffic domain.

Song Bi et al. in [1] proposes the image preprocessing technique for traffic video images, which includes the background construction and adaptive image segmentation with the help in-depth analysis. Results shown the ratio of machine classification and manual classification is 91.67%.

Anil Badiger et al. in [2] proposes a novel architecture which works in two modes Normal mode and Emergency mode. In this barricade, obstacle detector,
automatic starts and stops of vehicle and image processing for traffic density measurement. Display of signal on the vehicle uses LEDs through RF transmitter and receiver. The programming is done using Proteus 8 professional and C-PROG.

Mohammad Shahab Uddin et al. in [3] develop a new technique that detects traffic density according to the area of the edges of vehicles for controlling traffic congestion. Empty road analysis which involves image cropping, RGB to GRAY conversion, removal of unwanted area, edge detection. Next step is road with traffic analysis which involves same step as road analysis. Final step is decision making which will compare the areas and find the difference. This paper describes traffic density estimation technique which gives output area occupied by the edges of vehicles.

Yasar Abbas Ur Rehman et al. in [4] develop a method to detect the occurrence and non-appearance of automobiles on the road using statistical approach. Camera is static and the environment differs monotonically. The system is divided into four phase A. Vehicle Detection System shows automobile information, Vehicle Counting and Classification System, Traffic Signals Control System is used for decision making, Data Display System used for shows results of total number of vehicles.

Md. Munir Hasan et al. in [5] propose a technique for defining traffic congestion on roads with image processing methods and an archetypal for regulatory traffic signals built on data received from images of roads taken by video camera. First they extract traffic information from image and used technique like RGB, Sobel edge detected, Morphological closing, Flood fill operation and Binary image. They used ATMEGA8 microcontroller for regulatory traffic illuminations and USART (Universal Synchronous Receiver Transmitter) module for sending control information to the microcontroller.

R. Sanchez-Iborra et al. in [6] presented a novel independent system for regulating. This solution is composed by two main modules: a vehicle counter and an adaptive traffic light controller. They used PROA, a PROActive intelligent system for optimizing traffic signalling.

Ihtisham Ali et al. in [7] is proposed image processing techniques along with smart traffic control algorithm. Traffic recognition was achieved using cascade classifier for vehicle recognition utilizing Open CV and Visual Studio C++. The classifier was trained on 700 positive samples and 1140 negative samples. The results show that the accuracy of vehicle detection is approximately 93% by the help of queue based dynamic algorithm.

Varsha E. Dahiphale, Sathyanarayana Ramachandra Rao in [8] developed a system which can dynamically observes a driver’s level of vigilance and alerting the driver of any uncertain driving conditions is essential to prevent accidents.

The main modules of the system contain a video camera; a specially designed hardware system based on Raspberry Pi for real-time image processing and regulatory the alarm system.

Sakkachin Wongcharoen and Twittie Senivongse in [9] propose a method to predict traffic congestion severity level based on the analysis of Twitter messages. Different types of tweets data are used to construct a C4.5 decision tree model for prediction, counting tweets from selected road-traffic Twitter accounts, tweets that hold road-traffic-related keywords and geo-tagged tweets whose capacity suggests huge crowds in certain parts. Via a web request, the model can deliver a traveller with an estimate of the congestion severity level of the road.

Babitha Elizabeth Philip, Jaseela K. H in [10] general causes, effects and solutions for traffic congestion. Primary phase is to collect data from traffic volume for a working day, a public holiday and a Sunday for each location. Build model on bases of this input.

<table>
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<tr>
<th>Publication / Year</th>
<th>Papers</th>
<th>Advantage</th>
<th>Limitations</th>
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<tbody>
<tr>
<td>IEEE / 2011</td>
<td>- Research on Method of Feature Extraction and Recognition of Traffic Condition from Video [1].</td>
<td>- The selected parameters can describe traffic information effectively. - The process of traffic information recognition is fast. - Providing the membership of current traffic state to different traffic condition Class.</td>
<td>- Real-time traffic guidance information is missing. - Videos are not considering, work only on images.</td>
</tr>
<tr>
<td>IEEE / 2016</td>
<td>- SysteMatic and Automatic Road Traffic Junction [2].</td>
<td>- Counting the number of vehicles. - Automatic breaking system. - Each lane is provided with a camera</td>
<td>- Implemented only for single road. - Results are not shown.</td>
</tr>
<tr>
<td>IEEE / 2015</td>
<td>- Real-time Area Based Traffic Density Estimation by Image Processing for Traffic Signal Control System: Bangladesh Perspective [3].</td>
<td>- Easily estimate traffic density according to experiment results. - Results are properly mentioned.</td>
<td>- Not accurate. - Videos are not considering, work only on images. - Work on small data.</td>
</tr>
<tr>
<td>IEEE / 2015</td>
<td>- Modeling, Design and Analysis of Intelligent Traffic Control System</td>
<td>- Monitoring and controlling of intercity traffic in input images. - Results are properly</td>
<td>- Need of restoration techniques to retain the vehicle shape after final</td>
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<tr>
<td>Publication Year</td>
<td>Title</td>
<td>Strengths</td>
<td>Limitations</td>
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<tr>
<td>IEEE / 2014</td>
<td>Smart Traffic Control System with Application of Image Processing Techniques [5]</td>
<td>- Depending on the traffic density, a weight is calculated for each road and total traffic cycle is weighted for the roads. - Results are properly mentioned.</td>
<td>- Can use large number of interconnected traffic junctions. - Traffic density to adjust adjacent junction’s time allocation can also be done. - No graphical comparison made.</td>
</tr>
<tr>
<td>IEEE / 2016</td>
<td>Twitter Analysis of Road Traffic Congestion Severity Estimation [9]</td>
<td>- Innovative method to analyze traffic. - Data base is huge and reliable.</td>
<td>- Connection must be reliable. - Auto update can be done.</td>
</tr>
<tr>
<td>IJSER / 216</td>
<td>Traffic Flow Modeling and Study of Traffic Congestion [10]</td>
<td>- General problems of traffic congestion are highlighted. - Give theoretical idea to solve the parameter.</td>
<td>- No output or graphical representation of model they proposed. - Only conditions are given, no inputs are provided for that condition.</td>
</tr>
</tbody>
</table>

Table 1: Literature Review

IV. RESEARCH GAP
By studying above research papers in traffic congestion the problems which occur constantly and difficulties which are faced by traffic management system are:
- Implemented only for single road for multiple path still need improvement.
- Videos are not considering, work only on images from the video input.
- Work on small data.
- No graphical comparison made.
- Accuracy can be improved further for future experiments.

V. CONCLUSION
Traffic congestion is a difficult issue which needs special consideration. The procedure of smart and autonomous traffic management systems can significantly reduce many traffic congestion problems. The results in study recommend that the use of feature extraction is quite good in traffic images. Investments in smart transportation solutions, integrated with intelligent navy supervision principles such as better route development, off-peak shipping movement, substitute fuel vehicles, and hybrid vehicles, are among the many strategies that can help to reduce traffic. By using real time videos more work can be done in this area with the help of tools available in image processing.

REFERENCES

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