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Simulation based Automatic Traffic Controlling System

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Abstract - *Traffic signal is the most problematic issue now a day. Every single are taking 60sec at regular interval. The major problem of this system is that it can able to decrease the more waiting time for the drivers to cross road sign. We are using the algorithms model which is based on SCOOT or UTC algorithm. Using this algorithm new model will be liable to determine expected required timing as per provided inputs to the signal which is vehicles count. Traffic management is becoming one of the most important issues now a day due to the rapidly growing of urban population due to these; the number of vehicles on the road is increasing rapidly. The need of controlling streets, highways and roads become the major issue. Due to this problem of proper traffic management, there is a need for advanced technology and equipment to improve the state-of the-art of traffic control. Today's traffic management systems are not based on the live scenario, which leads insufficient traffic management. There is a need for developing self-adaptive system helps for better traffic management and helps to reduce the problem. This paper represents the method that can be implemented by using java software and its aim to prevent heavy traffic congestion. Images are effectively processed to know the traffic density; According to the processed data from mat lab, the controller will send a command to the timer show the particular time on the signal to manage traffic. The emergency vehicle detection such as ambulance, so that it can be detected easily and that lane can be given higher priority. The most communal example is the physical use of roads by vehicles. Here we suggest a system that implement SCOOT or UTC algorithm in real time traffic light control which will control the traffic light efficiently.*

***Key Words*: SCOOT- Split Cycle Offset Optimization Technique Algorithm or UTC-Urban Traffic Control Algorithm, congestion, traffic cycle, phase, cycle length, and average waiting time.**

1. INTRODUCTION

In modern life we have to face many problems, one of which is the increasingly serious traffic congestion. The urban population has experienced unimaginable growth in the modern era and, consequently, directly affects their mobilization in large cities. According to a United Nations report, the percentage of urban population worldwide constitutes around 56% in 2015, with a sharp increase of 1.84% each year. According to predictions, by 2050, approximately 64% of the developing world and 86% of the developed world practically urbanized.

Incredible increase in the urban population, there is a need for an effective system to combat one of the unprecedented challenges, which is traffic congestion in large cities. In the traditional traffic management system, inefficient traffic lights with predefined timers are used.

Today's traffic management systems are not based on the live scenario, which leads insufficient traffic management. There is a need for developing self-adaptive system helps for better traffic management and helps to reduce the problem. This paper represents the method that can be implemented by using java software and its aim to prevent heavy traffic congestion. Images are effectively processed to know the traffic density; According to the processed data from mat lab, the controller will send a command to the timer show the particular time on the signal to manage traffic. The emergency vehicles detection such as ambulance, so that it can be detected easily and that traffic lane can be given higher priority. Here we suggest a system that implement SCOOT or UTC algorithm in real time traffic light control which will control the traffic light efficiently.

2. RELATED WORK

[3]The authors are show how the new fuzzy logic traffic control system for the "+" junction eliminated the problems observed in the manual and conventional traffic control system through simulation software developed using the Java programming language. This document is divided into five sections. The first section was provided brief introduction to traffic management in general and described the situations in urban cities.

[4]To show the ability to improve traffic flow, we are decided to implement our agent-based algorithm for traffic light control within the microscopic traffic simulation "SUMO". SUMO is an open source traffic simulation developed in our institute. As the [5] OIS system has been tested within a certain area around the site of our institute, we have used a digital network that represents it as our simulation scenario. The OIS sensors themselves will not be studied here, but only their simulation and the simulation of the traffic light control algorithm. At the beginning, this algorithm will be presented, followed by a description of

how the simulation was prepared. Then we will give the results of the simulation, followed by some conclusions and a discussion of open questions.

The image processing technique is better because it has its own computer visions, adaptable to the particular environment. Low cost and prevents alteration and provides accurate output and helps control the traffic light time limit, dependent on the density of the vehicles. There, two images are combined using the image matching technique and the percentage of image matching is also used to indicate the time allocation of a traffic light.

In the new technique developed to detect the detection of emergency vehicles in these, the binary image obtained is a threshold so that only the red light can be detected. The headlights of the vehicle can be detected, so the processing is done so that the red light flickering is visible. When this red light is detected, that lane is given higher priority and the entire system is stopped during that period of time so that the vehicle can easily pass through that lane. This is useful for detecting the ambulance, the fire engine, etc. There are four steps, such as the vehicle detection system, the vehicle counting classification system, the traffic signal control system and the data display system. The traffic signal control system detects the number of vehicles on the road and, consequently, the priority is assigned to the particular lane. The data display system shows the total number of vehicles and the number of pixels that each vehicle contains. Consequently, the number of vehicles falls into what category is considered.

The use of the traffic control algorithm to implement the traffic system. We take the traffic density of the different roads at a given time of entry and, consequently, the time allocation is made to the traffic signal. Time is allocated according to the traffic cycle and the weight factor.

Consequently, percentage matching and time allocation are performed. In addition, these are implemented using the simulation in which the four forms of the traffic intersection model are designed. This four-way intersection model consists of four sets of LEDs with each set with red and green light.

The image is captured in the camera and then converted to a grayscale image. The grayscale image becomes the threshold image. The edge detection method using the canny edge detector. In which the contour has been drawn to calculate the vehicle count.

3. EXIXTING SYSTEM

[6] The rapid growth of vehicle ownership is one of the measures for the economic growth of the country. The exploitation of new trends and technologies requires a rapid transport of all goods equally. The goal of each one is to reach the destination without wasting time and money. Therefore, road traffic management is crucial to reduce wait and travel times, save fuel and money. In the current scenario, low or high traffic information is offered only by those affected by that traffic problem for waiting a long time to get the signal to move to the other side.

DISADVANTAGES OF THE EXISTING SYSTEM

1) Waiting too long to get the traffic signal.
2) Waste of fuel.
3) If accidents occur, sharing the information takes a long time.

3. PROPOSE SYSTEM

Provides the time for vehicles to cross the road based on the measured density of traffic. If one of the lanes is empty between four lanes, you can skip that lane and pay attention to the lane that has more density. If it detects emergency vehicles, it first allows that vehicle to go fast by blocking the other three lanes.

We have seen that we need to investigate more about the coordination of the lights. A mechanism for this has not yet been designed and should be done as follows. There are also other systems to evaluate. Currently, we are developing a system that re-identifies vehicles that pass a set of camera-equipped crossings. Among other things, travel times are calculated from these reidentified cars. These travel times are valuable data, e.g. for greater optimization of traffic light control. Such traffic improvement methods could also be simulated, and they can also be one of the additional steps.

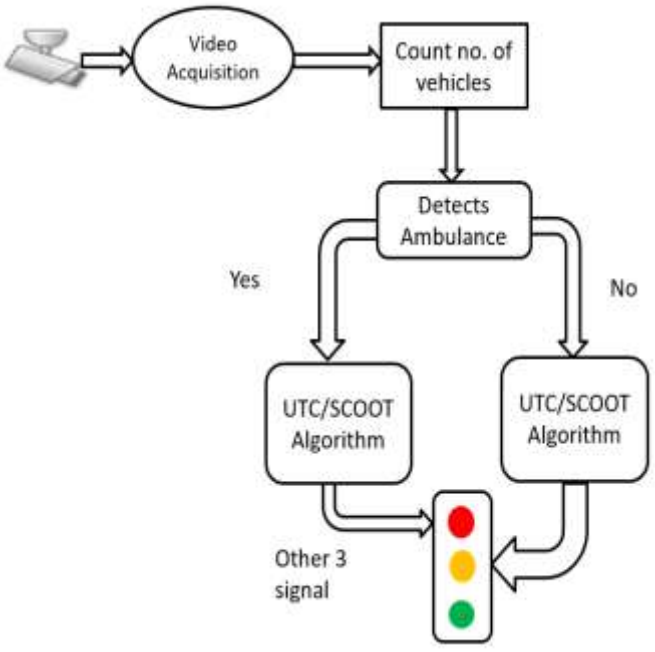

Fig.- Block diagram of Automatic Traffic Controlling System.

What is SCOOT?

[1] The SCOOT urban traffic control system was developed by the Transportation Research Laboratory (TRL) in collaboration with the United Kingdom traffic systems

industry. SCOOT is an adaptive system that automatically responds to traffic fluctuations. Eliminates the need for signal plans that are expensive to prepare and keep updated. SCOOT has proven to be an effective and efficient tool for managing traffic on signposted road networks and is now used in more than 130 towns and cities in the United Kingdom and abroad.

This booklet aims to draw the attention of the road authorities to the advantages of SCOOT. Some authorities may not know the benefits of installing SCOOT. Others who already have SCOOT systems may not get the best of them or appreciate the benefits of extending or updating them. SCOOT has been improved in recent years, and research currently underway by TRL and SCOOT providers will offer additional improvements in the near future.

How SCOOT Work?

[1]The core software at the heart of an SCOOT system is standard for all installations7. The additional software (the "woven" software) that links the SCOOT core with the equipment on the street and that provides the user interface is specific from the provider.

SCOOT sends instructions to the team "on the street" using dedicated telephone lines. These instructions are interpreted and applied by the road signs team. The equipment responds to the central computer confirming the acceptance of the instruction, or detailing a fault condition.

SCOOT obtains information about the traffic flows of the detectors. As an adaptive system, SCOOT depends on good traffic data so that it can respond to changes in the flow. Normally detectors are required on each link. Their location is important and they are usually located at the upstream end of the approach link. Normally inductive loops are used, but other methods are being developed.

When vehicles pass the detector, SCOOT converts the information into "link profile units" (lpu), a mix of link flow and possession. This is the unit used by SCOOT in it is calculations. The "cyclic flow profiles" of the lpu over time are built for each link.

An SCOOT network is divided into "regions," each of which contains a series of "nodes" (signposted crossings and crosswalks that run at the same time as the cycle to allow coordination). The nodes can be "double cycle" (that is, operate at half the time of the regional cycle) at the crosswalks of saturated junctions. The boundaries of the region are where the links are long enough so that the lack of coordination does not matter.

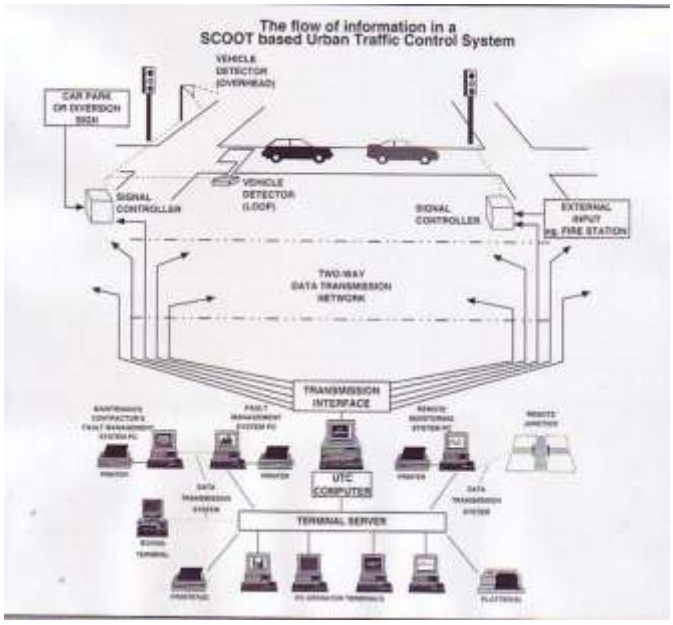

Fig.- Implementation of SCOOT Algorithm

4. CONCLUSIONS

The flow of traffic simulation is virtually essential to traffic control at a near-optimum level. Only from a simulation analysis can analytical decisions be made concerning street development, type of intersection control, and the feasibility of computerized traffic control. Only from the simulation analysis can analytical decision be made concerning street development, type of intersection control, and the feasibility of computerized traffic control.

Information technology has transformed in the early stages of change transportation systems. This simulation based on traffic control system and it provides better performance in terms of total waiting time as well as total moving time. it necessary to say that the system under question is not only highly efficient but also has curbed successfully the alarm of traffic deadlock which has become a phenomenon on the roads as less waiting time will not only reduce the fuel consumption but also reduce noise pollution

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