Techniques for Automatic Lane Correction and Remote Control of Automobiles Using Algorithms

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Abstract— **Technology improvements are happening on a day to day basis. In order to grow, we need to update ourselves, so as the main aim of this paper. We see vehicles on road moving in one lane as a chain sometimes and out of chain the other. We aim to bring this under control by using the Algorithms of latest technological advancements in the field of electronics and computer sciences. The whole idea is to make communication between the vehicles possible using electronic devices like IR Transmitters and IR receivers, Pulse encoders and Decoder and an Android application connected to a central server to map the movement of the vehicles. This is made possible by using Data Analysis, Control of Vehicles and an Android application using the centralized server located remotely in another location. When the vehicles travel in one particular lane where there is traffic ahead, they are instructed to change the lane to avoid it and prevent dead lock traffic jams and accidents.**

Index Terms— **IR LED, IR Photo Diode, Server, Algorithm, Automatic Lane correction**

I. INTRODUCTION

The Main Aim is to make the Algorithm functional in the wide spread open environment where there is traffic. This Algorithm's Success will bring a predefined discipline in the mobility of free traffic and the advantages of which can prove lot of advancement in the application of technology in this field especially in the developing countries like India where the ratio of road accidents are alarmingly high.

Algorithms are drawn in such a way that each vehicle is capable of communicating with the other using the available electronic gadgets and an Android application which is linked to the centralized server located in a remote area. Coding is done using SQL Server for fetching data about the behavior of the vehicle which communicates with the fellow vehicle using electronic devices like IR LED, IR Photo Diode and Pulse Encoders and decoders[1].

II. HISTORY OF WORK IN RELATED FIELD

This Idea is drawn for the concept in which the communication between two vehicles is possible to alert the presence of the drunk driver riding a vehicle in a free traffic.

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The base of this concept arises from the Nissan Concept car to prevent Drunk and Driving. The latest advancement of this concept is this idea of prevent unstable movement and control of free traffic

III. PROPOSED SYSTEM WORKING

Today we see in many developing countries like India where people spend half of their work time in traffic. They are stuck for hours on the rush hour. Improper flow of traffic and lack of control is the prime cause of this problem.

Now we can work on this Algorithm to prevent such incidents to happen[1, 2]. The possible way to prevent is to control the traffic during rush hours of the day. The proposed system consists of Transmitter and receiver which connects the vehicles to one another. The following is the flow chart of the Algorithm used in this system. The below flow chart can be described as the following that the Algorithm starts when there is an open traffic. When the traffic gets destabilized, the server reacts to the signal and sends a correction signal back to regulate the flow of traffic to the normal.
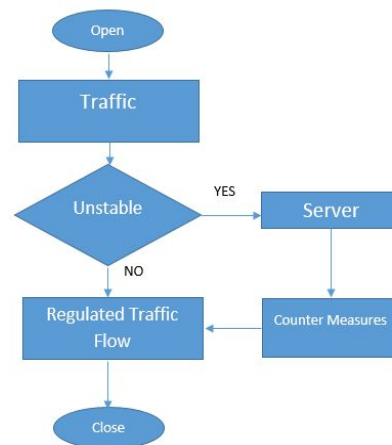

Figure 2. Proposed system's flow chart

The working of this can be practically implemented with the suitable server and the network which will be created to server the purpose.
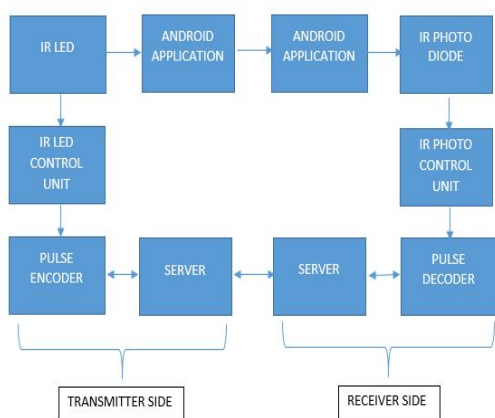
IV. FEATURES OF THE PROPOSED SYSTEM

- ➢ The features in the Algorithm
- ➢ Flexible and open architecture
- ➢ Multiple medium interface
- ➢ Alarm Handling and Trending
- ➢ Access Control
- ➢ Automation
- ➢ Logging, storing, Report Generation
- ➢ Network Security

This Algorithm is very flexible as it can be interfaced with any working device and is used to set up a monitoring unit and also a control unit   and it's a multiple medium interfacing unit where lot of devices can be interfaced and monitored. The main advantage in multiple interfacing is to perform automation of the vehicles and control their path of motion[1, 2].

V.   HARDWARE AND WORKING

The hardware for this Algorithm is easily available in the market, one has to interface this with each other and have to setup a server which can monitor and control the vehicle. The IR Transmitter which is an IR LED is used as a Transmitter of the vehicle's signal and it is received by the other vehicle using IR photo diode. Thus creating the communication possible using pulse encoder and pulse decoder in Manchester coding techniques.

Figure 3. Circuit diagram of the proposed system

The above figure shows the circuit diagram which consists of a sender side which is a transmitter and a receiving side which is a receiver. Transmitter and Receiver are set up in every vehicle and is this is how the Algorithm works in an open environment. The stress signal is first sent from the transmitter side, which is fed to the IR control unit as well as to the android application. This signal is then passed either through the application channel or by the server based channel based on the stress call priority of the signal which is judged in the control unit of the transmitter. This signal is then fed to the pulse encoder from the transmission and is passed to the pulse decoder on the receiver side. Thus making the communication possible in the automobiles. The server has a track of the vehicle and it creates the counter measure codes if the vehicle is in the lane with heavy traffic[1].

Sometimes the idea behind this control can be compromised when the server breakdown occurs. So it is recommended to have a manual override facility in this Algorithm which can be manually intercepted using the control unit on either of the sides i.e. both the transmission side as well as receiving side. The working of this Algorithm is well explained in the discussion part.

VI.   DISCUSSION

6.1

This Algorithm is mainly useful when the traffic in an area is at its peaks in a rush hour. More the traffic, more the possibility of a dead lock. This is the most frequent happening condition in the developing countries like India where one always finds himself stuck in traffic in the evening times. This can be possibly solved by widening of roads but land is precious, so the use of this Algorithm makes it much simpler.

This Algorithm helps vehicles communicate with each other and when one vehicle is out of the lane, it sends the message code to the vehicle behind it and to the vehicle which is deviating from its lane. If the correction is not applied in a given amount of time, the control unit in the Transmitter and receiver takes the control of the vehicle and corrects the lane of the vehicle. This can be triggered from the server room. By this technology, the possibility of traffic jams and deadlocks will be reduced as the vehicles move in a disciplined manner compared to the previous situation[2].
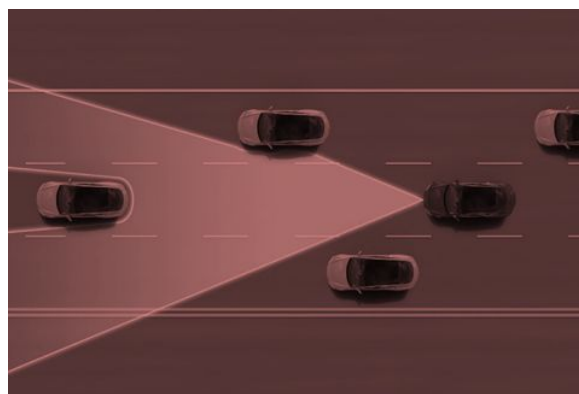
Figure 5 Application of the Algorithm

6.2

When the communication between two or more vehicles is possible, there is a lot one can achieve using this technology. Another example of this is to remotely drive the vehicle from another vehicle. This can be achieved from the host server with proper authentication. When the request to drive the vehicle remotely is initiated, the driver is informed to release the control so that the server can take over the control, for which the driver has to give an affirmation signal. Without which this concept could turn out to be a greatest mistake in the advancement of science and technology

The growth of technology in today's life can be considered as a creative destruction type of development. This can be seen from the concept which we are putting forward as it may relieve the jobs of drivers which operate the vehicles on a daily basis.

6.3 ADVANTAGES
- ➢ Less traffic jam
- ➢ Monitor and control of vehicles from any part of the world
- ➢ Safe and efficient electronics
- ➢ High security
- ➢ Easy to operate and user friendly

6.4 DISADVANTAGES

- None of the DC systems are compatible to each other i.e. interfacing is difficult.
- Where there is safety, the cost goes high.
- Complex design of the wireless card and network.
- Security can be compromised and the system is prone to Hacking[1, 2]

CONCLUSION

The application and the use of this Algorithm provides a better and a safer use of electronic devices and the smart technology provides automation of streets and any electronic vehicle in an open environment. The future of this system is about to bring a revolutionary change in the use of electrical and electronics devices.

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