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A REVIEW PAPER ON INTELLIGENCE TRANSPORTATION SYSTEM

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ABSTRACT

Intelligent displacement is described as providing a path for traffic between cars so that drivers are aware of which side the approaching vehicles are coming from in advance. By doing this, we may reduce the number of accidents that occur when we are most alert to them. This intelligent transportation system uses IOT, which is a highly effective and unique way to address the issues with displaced traffic in cities. We are aware that utilizing automobiles in our city presents us with a number of challenges. To control traffic on the road, intelligence systems may collect data from vehicles and feed it into the proper server with the use of s. This minimizes the transport system and is less expensive and more effective. It advances product quality while safeguarding people from mishaps. This system is crucial since it is capable of sending information to the vehicle radar on its own because it is so effective. in order to lower accident rates.

1. INTRODUCTION

By extracting productivity gains from the collective action of modern publicity technologies into the moving support and in Intelligent vehicle, Intelligent Transport System improves transportation safety and adaptability and amplifies worldwide connection. The use of computer, electronics, and communication technologies as well as management master plans in intelligent moving systems is intended to enhance the patrol and control of the basic moving system by giving passengers information. These systems integrate with the complicated hold systems to improve the protection and sparseness of road systems. They include cars, drivers, passengers, drivers, and managers all communicating with one another and the surrounding area. According to a message from the Commission for worldwide Road Protection (June 2006), the number of worldwide road deaths ranged from 750,000 to 880,000 in 1999 and was expected to reach 1.25 million annually as the toll rises. Road accidents were the ninth most common cause of loss or disability in 1999, according to World Health Organization News, and it is expected that by 2020 they would move up to the sixth spot. These stagnant statistics are expected to rise significantly in the absence of significant adjustments to the road transportation infrastructure. Future transportation technology called the intelligence transportation system includes sophisticated information and communications for both roads and cars. The intelligence transportation system employs cutting-edge technology, advanced sensors, and connectivity. This application enhances the state and effectiveness of the transportation system while giving passengers access to crucial information. ITS is used in navigation systems, air transportation systems, water transportation systems, and rail systems in addition to highway traffic. The need for and development of transportation systems are expanding along with the popularity of intelligent transportation systems, which are classified into generations.

2. LITERATURE REVIEW

We examined many digital libraries, including the IEEE, ACM, Springer, Elsevier, and Google Scholar databases, in order to perform a progressive evaluation of ITS. Based on the search term used for this review, we discovered 28000 results. We downloaded the research articles from the search results and, after manual screening (during which we evaluated the papers by reading their titles, abstracts, and conclusions), identified the 25 most relevant publications. A few articles that were poor in relation to our evaluation were also removed from the list of candidates. Review of each of the 25 articles is given. A system for managing traffic signals to provide the greatest possible flow along the route and moving traffic was put out by Shandi et al. Real-world scenarios are used in this method. The sensors provide traffic flow data to a computer, which is then used to change the time of the green light using a Genetic Algorithm (GA). Based on the results of the simulation, it can be shown that the road and crosswalks are fully used. In addition to allowing them to interact, it intends to analyze the link between transportation emissions and air quality concentrations. Data centers receive air data from Air Quality Stations, and then on the basis of such data, the Data Center Submit a restriction request to traffic management. Afterwards, vehicle restrictions After turning on traffic monitoring, traffic monitoring centers ask public transportation management for more buses. The technology can automate the evaluation of the level of air pollution, according to simulation findings. Project SMARTY for practical transportation and mobility in smart cities was described in9. The majority of its services depend on the information gathered by social and environmental sensors. It comprises of an urban sensing module and a social sensing module

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that gathers data from social networks, tweets, and other sources. To identify crucial information like traffic flow and accidents, data is further analyzed utilizing various mining methods. The user may choose the best routes thanks to all of this information. A new parallel transportation management system was suggested in 2010. (PTMS). It mostly involves modeling analysis and model-based decision-making. Operator Training System for Transportation (OTST), Dyna CAS (Testing and Evaluation Component), Agent-based Distributed and Adaptive Platforms for Transportation Systems (ADAPTS), and ITOP are some of the components that make up PTMS. (Actual control and management component of traffic equipment and system). Intelligent Sensor Information System was described in In11 (ISIS). An active CCTV technique ISIS may be used to minimize crime and bad behavior on public transportation networks. The event composition component is used to directly identify minor occurrences and combine them to infer larger, more significant events. To provide an alert in real-time across a wireless network, according to the overall system architecture Control room software is integrated with on-board event recognition. An emergency response system for catastrophes was suggested by Alazani et al.4 and specifically focused on the transportation sector.a new tactic known as the Weighted Congestion Coefficient Feedback Strategy in 18 (WCCFS). Any dynamic information may be created using this method and displayed to assist road users. Three current technologies are compared to the simulation findings. The findings show that WCCFS is superior than other technologies. WCCFS has a great chance of enhancing road conditions and reducing the consequences of traffic congestion. To help the government, plans to create an artificial emergency planning system were made in 2019. (AELPS). AELPS uses artificial society theory based on agent-based modeling to characterize the features of the components in the emergency system. Results produced by AELPS may be used to emergency planning. To offer disaster assistance, the AELPS framework assembles a number of components, including the pollution, medical and rescue, geology, weather, epidemiology, and transportation subsystems. To reduce fuel consumption and emissions, Alabaman et al.7 concentrated on developing Economical and Environment Friendly Geo cast (EEFG) methods. They suggested a technique for fusing fuel model with vehicular network integration. These models include the Geocast protocols, the Comprehensive Modal Emissions Model (CMEM), and the Virginia Tech Microscopic Model (VT-Micro). To minimize emissions and fuel consumption, the main concept is to convey information about Traffic Light Signals (TLS) to moving automobiles. In this paradigm, geo cast protocols with TLS are crucial. It uses the VT-Microscopic model to calculate fuel consumption. A new tactic known as the Weighted Congestion Coefficient Feedback Strategy in 18 (WCCFS). Any dynamic information may be created using this method and displayed to assist road users. Three current technologies are compared to the simulation findings. The findings show that WCCFS is superior than other technologies. WCCFS has a great chance of enhancing road conditions and reducing the consequences of traffic congestion. To help the government, plans to create an artificial emergency planning system were made in 2019. (AELPS). AELPS uses artificial society theory based on agent-based modeling to characterize the features of the components in the emergency system. Results produced by AELPS may be used to emergency planning. To offer disaster assistance, the AELPS framework assembles a number of components, including the pollution, medical and rescue, geology, weather, epidemiology, and transportation subsystems. To reduce fuel consumption and emissions, Alabaman et al.7 concentrated on developing Economical and Environment Friendly Geo cast (EEFG) methods. They suggested a technique for fusing fuel model with vehicular network integration. These models include the Geocast protocols, the Comprehensive Modal Emissions Model (CMEM), and the Virginia Tech Microscopic Model (VT-Micro). To minimize emissions and fuel consumption, the main concept is to convey information about Traffic Light Signals (TLS) to moving automobiles. In this paradigm, geo cast protocols with TLS are crucial. Measurements of fuel usage and CO_2 emissions are made using the VT-Microscopic model.

3. OBJECTIVES

Intelligent Transport Systems (ITS) apply information and communication technologies to transport. Computers, electronics, satellites and sensors are playing an increasingly important role in our transport systems. ITS as such are instruments that can be used for different purposes under different conditions. ITS can be applied in every transport mode (road, rail, air, water) and services can be used by both passenger and freight transport. The objective of the review is to verify paprameters as follow:-

- Traffic and Transit Management
- Traffic Signal Systems
- Global Positioning Systems
- Weather Information System
- Commercial Vehicle Electronic Clearance

- Real Time Traveler Information
- Incorporates advanced management techniques and technology to improve productivity.
- Increasing efficiency in existing systems and programs.
- Integrates and facilitates coordination between relevant systems and programs
- Provides travel information before and during the trip for informed decision making.

4. APPLICATION

Application for road safety Applications for road safety use wireless V2X connections with ITS abstractions in the immediate vicinity (such as rockets and road infrastructures) to reduce traffic accidents and protect drivers from different road risks. Each ITS entity transmits safety messages on a regular basis to notify the community of its location and current state. Each ITS entity may additionally create the sending of notification messages to nearby cars and emergency services based on specified situations (such as collisions; see road danger) TrafficManagement Applications.[4] Applications for traffic management make up a second important class of ITS applications, and their primary goals are to improve the management and coordination of traffic flows and to provide drivers a variety of cooperative navigation services. The creation and upkeep of these applications' databases for world traffic maps depends on the gathering and examination of the ITS messages that are exchanged (i.e., between ITS entities). For further data processing and analysis, the traffic data are often gathered by the installed roadside devices and/or from road sensors and wirelessly transferred to distant, reputable data centers. The information gathered includes location-based and contextual data on cars, drivers, and traffic-related incidents.

Autonomous Driving Applications

Autonomous driving, also known as automated driving, applications represent the next big leap in human transport technologies, which is habitual to be deployed by 2020 and totally functional by 2030.This newtechnology will build on the automation of the vehicle fell and driving functions, based on six levels of automation, where the human driver becomes a passenger and is no longer required future autonomous cars will integrate different technologies, including:In order to avoid collisions, there are [6] ultrasonic sensors to detect the existence of objects and [liter and/or radar] to provide a 360-degree field of vision. high-definition cameras to detect road dangers including pedestrians and animals in real time. Applications for entertainment and comfort Applications for entertainment and comfort are designed to enhance driving by offering users a variety of extra-value services. These services are often provided by dependable service providers, and comparable programs and services are downloaded and installed on the application units of the automobiles. Through their OBUs, AUs connect to the distant SP data centers utilizing a variety of V2I communication methods, including as 4G/LTE and 5G. Such an application often takes the form of a remote vehicle diagnostic and supply application, in which the SPs.

5. VEHICLE DATA COLLECTION

For research processing and remote monitoring, this system gathers vehicle data pertaining to performance and quality. The system is dependent on databases, web-based interfaces, server software, and vehicle gateway. Military, engineering, ground durability testing, vehicle tracking, and preventive maintenance applications of the system implementation support. The Georgia Tech Trip Data Collection DRIVE Atlanta Laboratory is an example of this system. The technology uses GPS to track the location, speed, and second-by-second driving history of the car.

6. EMERGENCYVEHICLENOTIFICATIONSYSTEM

Traffic jams, explosions, and other emergency circumstances may all be forewarned of by using intelligence transportation system, particularly the FCD (Floating car data) model. The technology may then recommend other routes or make decisions for drivers to prevent traffic and travel delays.

7. INTELLIGENTTRANSPORTATIONTECHNOLOGY

A. Wireless communication: in For intelligent transportation systems, several wireless communication methods have been proposed. Within the mind transportation system, adio modem transmission on UHF (ultra-high frequency) and VHF (very high frequency) frequencies is often utilized for short- and long-range communication. The field of wireless communication has grown significantly. Wireless networks link the devices together, convey the data using signals, and share the data between nodes via utility media (radio wave, microwave). Short-range dedicated communication It allows for limited communication between the car and the roadside places. The Intelligence Transportation Society of America often suggests short-range communication.Mobile ad hoc networks and mesh networking may be used to extend this protocol's range.Long-distance and medium-distance communication Long-range and medium-range continuous air interface A car and the roadside may communicate over long and medium distances or continuously utilizing a variety of communication methods, including as cellular and infrared communications. It will provide a variety of applications, such as information and safety for vehicles as well as joy for the driver and passenger. These sensors can keep an eye on a variety of factors, including temperature, humidity, vehicle movement, pressure, noise, speed, and direction.

figure1.

B. Computational Technology. Sensors, traveler computers, vehicle computes, and computers in the static framework will all be produced using computational technology. The integration of operational systems and processes into transportation vehicles has also made it possible to install software applications, artificial intelligence systems, and other programs everywhere that are intended to be incorporated into a better transportations system.

C. Floating Car Data/Floating Cellular Data. Transportation systems determine the transportation speed on the railway using floating car data (FCD). FCD utilizes a variety of data kinds, including speed, travel direction, time, and localization information from mobile devices, which also serve as sensors. Techniques for detecting floating vehicle data not in real time

a. Manual server

b. Video recording and Manual search.

c. In vehicle data recording

Real time:

a. Not inductive loop

b.Automatic number plate recognition (ANPR)

c. GPS trace and mobile commons like a example GSM d .Radio signal triangulation

e. Road side beacon and dedicated short range tag.

D. Sensing. The first thing we want for every road application is message from the road. These details may be obtained via roadside sensors. There are various different types of sensing, including mobile sensing, which places sensors within a moving vehicle, static sensing, which uses both on- and off-road sensors, and hybrid sensing. This section examines each division's core technology and outlines some unanswered concerns about the state of Indian roads.

E. Inductive Loop Detection: loop induction Vehicle detectors are detecting systems that trigger an electrical current in a wire using a magnet. For signal transmission and communication, inductive loops are used for things like vehicle detection, vehicle passing, and presence. A control box is linked to one or more wire loops that are anchored under the roadway. Inductance decreases as a vehicle cross or pauses on the loop, indicating the presence of a vehicle.

Benefits:

a. Not impacted by environmental conditions

b. Accurate indexing vehicle presence

c. Performs well in both high and low volume traffic.

The System Are Consist with Three Components:

Loops .Loop Extension Cable Detector

F. Video Vehicle Detection: In intelligent transportation systems, video vehicle detection is a potent method of detection. It is one of the most popular techniques. An image processor is used for video detection. It is composed of a microprocessor's core CPU plus video image resolution software. The user positions virtual "detectors" on the video picture presented on a monitor using a mouse and interactive graphics. Statistics may be sent in stages to a server for instant examination.

G. Audio detection: The audio signal, which consists of the additive sound from tire noise, engine idle noise, hooks, and air frenzied noise, may be used to quantify the frequency of traffic on a route. An audio signal processing technology and different vehicle noises are picked up by a roadside microphone, which is utilized to gauge the traffic situation.

H. Bluetooth detection: Bluetooth is a reliable and affordable solution to calculate trip time and do objective analysis. Bluetooth is a wireless communication protocol used by Bluetooth devices in moving vehicles. These sensors can determine trip time and offer information for origin and ambition matrices if they are in close proximity to one another. Bluetooth measuring differs from conventional traffic measurement technology in a few ways.

8. CONCLUSION

In Indian cities, the issue of traffic congestion is significant. The topic is intriguing to tackle because of the features of Indian roadways and traffic. There is room for innovative new solutions, empirical concept evaluation, and cooperation between the public and commercial sectors. Existing ideas may be evaluated in a variety of difficult traffic conditions.

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