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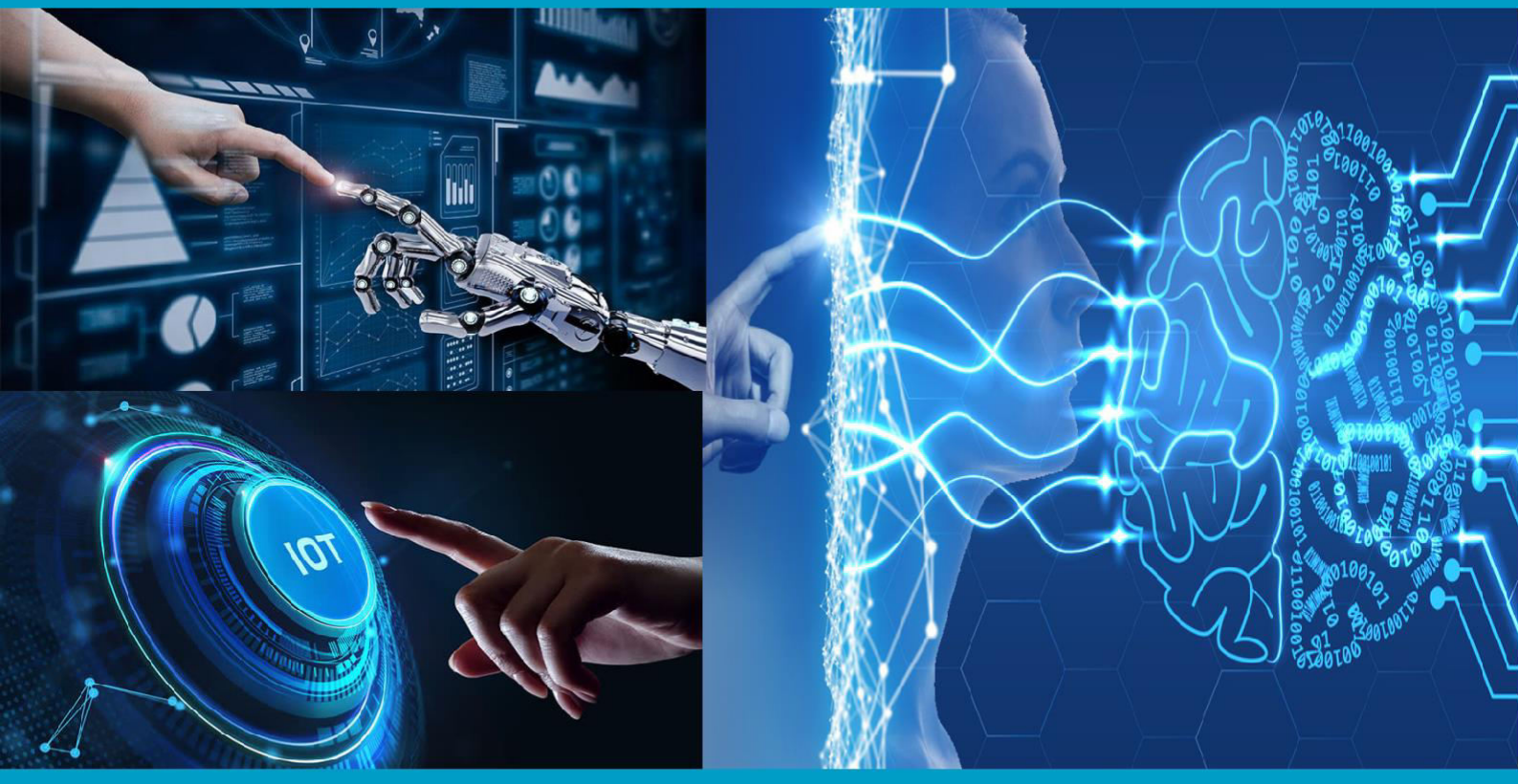

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Traffic Prediction for Intelligent

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ABSTRACT: Traffic control has been an issue for a long time from the past. The modern world demands technology. Now a days cars are one if the main methods of improvement in technology. Intelligent Traffic System is also known as Intelligent Transportation System apply communication and information technology to find the solution for the Traffic control issues. Intelligent Transportation System represents the main problem in transportation. ITS is a program it is used to improve the efficiency of transportation through advanced technologies by using sensors and communication. Some of the problems like traffic, low safety can be solved through this intelligent transportation system by using latest techniques in traffic management. ITS is improved by using wireless and wire line communication-based information, control and electronic technologies. Now a days over speeding is a key issue in the traffic control system to overrule the issue. Dophler Phenomenon is used for speed measurement.

KEYWORDS: Traffic Environment, Genetic algorithm, Machine learning, Big Data, AI, Image processing;

I. INTRODUCTION

Intelligent transportation system is used for analyzing the information. ITS is used to control communication technologies for road transportation to improve safety and efficiency. Intelligent transportation system includes a wide range of application which is used to get information to control congestion to improve traffic management to reduce the environmental effects and increase the benefits of transportation. ITS refers to the different types of needs and the transport field with many others policing. But also due to less connection of traffic flow. Smartphones having different sensors it can be used to detect the speed of traffic and quality of the read. Data is connected through the audio and GPS. It tracks the identity of traffic and possible jams occurred in the traffic.

With the increasing urbanization and the growing number of vehicles on the roads, accurately forecasting traffic conditions has been essential for efficient traffic management, route planning and resources allocation. Intelligent traffic prediction system leverage advanced technologies and data analysis technique to anticipate traffic patterns and proved insights for decision making.

The advancement in AI, machine learning and big data analytics have significantly enhanced the accuracy and reliability of traffic prediction system. By continuously learning from new data these systems can refine their models and improve their predictions over time. Additionally, the integration if intelligent traffic prediction systems with other smart city infrastructure such as connected vehicles and smart traffic lights, enables real-time adjustment and further optimization of traffic flow. In this technology, intelligent traffic prediction system utilize various data source such as histological traffic data, real-time sensor data, weather information and social media feeds to generate accurate and reliable prediction. These systems employ sophisticated algorithms and machine learning techniques to analyze vast amount of data and identify underlying patterns and trends.

II. LITERATURE REVIEW

Stevens, A (1996) Review of the potential benefits of road transport telematics, TRL Report 220. Crowthorne TRL.:

Telematics refers to the integration of telecommunications and information technologies in vehicles and transportation systems. The report by Stevens likely examines the potential advantages and applications of telematics in the context of road transport. It may explore various aspects such as vehicle tracking, navigation systems, traffic management, driver assistance, and data communication between vehicles and infrastructure.

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Travel time prediction under different traffic conditions using global positioning system and its data come from buses. from buses. IET Intelligent Transportation Systems. 3(1), 1–9 (2009):

The article titled "Travel Time Prediction under Different Traffic Conditions Using Global Positioning System and Its Data from Buses" published in the IET Intelligent Transportation Systems journal in 2009 focuses on predicting travel times in varying traffic conditions by utilizing data obtained from buses through the Global Positioning System (GPS).

Vanajakshi L Real Time Identification of Inputs for a BATP System Using Data mining. DOI https://doi.org/10.1007/s40999-017-0210-y (2017) :

The article titled "Real-Time Identification of Inputs for a BATP System Using Data Mining" authored by Vanajakshi L and published in 2017 focuses on the application of data mining techniques to identify inputs in a BATP (Bus Arrival Time Prediction) system in real-time. The article likely discusses the use of data mining methods to extract relevant features or variables from available data sources in order to improve the accuracy and reliability of bus arrival time predictions.

Accident Analysis and Prevention, 132 , 105226. https://doi.org/10.1016/j.aap.2019.07.002:

Accident Analysis and Prevention" is a reputable journal that focuses on research related to traffic safety, accident analysis, and prevention strategies. The article you referenced is likely a research paper published in the journal's 132nd volume.

III. METHODOLOGY

Gather historical traffic data from various sources, such as traffic sensors, GPS data, traffic cameras, and historical incident reports. Additionally, collect real-time data streams, including current traffic flow, weather conditions, and special events.

Clean the collected data by removing outliers, handling missing values, and normalizing the data to ensure consistency and accuracy. This step may involve filtering noise from the sensor data, adjusting timestamps, and merging datasets.

Deploy the trained model to make real-time predictions. Continuously collect new data from traffic sensors, weather APIs, and other relevant sources. Feed this data into the model to generate predictions for future traffic conditions.

IV. DESCRIPTION OF HARDWARE

Traffic prediction relies on real-time data collection from various sources. One common hardware component is a network of sensors strategically placed throughout the road network. These sensors can include technologies like induction loops, infrared sensors, or cameras to capture traffic flow, vehicle presence, and speed.

To transmit data from various sensors and cameras to the central processing unit, a robust communication infrastructure is required. This may involve wired or wireless networks, such as cellular networks, Wi-Fi, or dedicated communication channels. The infrastructure should provide reliable and secure connectivity to ensure uninterrupted data flow.

V. ADVANTAGES

Select an appropriate machine learning model for traffic prediction. Popular techniques include regression models (linear regression, decision trees, random forests), time series analysis (ARIMA, SARIMA), and neural networks (LSTM, CNN). The choice of model depends on the nature of the data and the specific prediction task. Assess the trained model's performance using the testing set.

VI. RESULTS

Traffic prediction allows for the identification of congestion-prone areas in advance. With this knowledge, traffic management systems can implement measures to alleviate congestion, such as adjusting traffic signal timings, implementing reversible lanes, or diverting traffic to alternate routes. By reducing congestion, travel times can be

reduced, and the overall efficiency of the transportation network can be improved. Traffic prediction enables better resource allocation, such as the deployment of traffic control personnel, emergency services, and maintenance crews. By anticipating traffic conditions, authorities can allocate resources strategically to areas where they are most needed, ensuring a timely response to incidents, accidents, and emergencies. Traffic prediction systems generate valuable data that can be analyzed to gain insights into traffic patterns, trends, and user behavior. This data can inform policy decisions, transportation planning, and infrastructure development. It enables authorities to make data-driven decisions to improve the efficiency and effectiveness of the transportation system.

VII. FUTURE ENHANCEMENT

With the increasing availability of data from various sources, including sensors, cameras, and connected vehicles, the application of big data analytics and machine learning algorithms will play a crucial role. Advanced data processing techniques can extract valuable insights, identify patterns, and enhance the accuracy of traffic prediction models. Future systems will integrate data from diverse sources, such as traffic sensors, GPS devices, social media feeds, weather sensors, and even smart city infrastructure. By combining data from multiple streams, traffic prediction models can consider a broader range of factors influencing traffic conditions, resulting in more accurate and holistic predictions.

User interfaces and visualization tools will improve to provide intuitive and user-friendly representations of traffic predictions. Interactive maps, augmented reality displays, and mobile applications will enable users to access and understand traffic information easily, empowering them to make informed decisions about their travel routes and times. Future systems will focus on predicting traffic conditions across different modes of transportation, including cars, public transit, bicycles, and pedestrians. This integrated approach will allow for more comprehensive transportation planning, optimizing routes, and encouraging sustainable travel choices. It will also facilitate seamless multimodal navigation and provide users with personalized recommendations.

VIII. CONCLUSION

In conclusion, traffic prediction for intelligent transportation systems holds significant potential for revolutionizing the way we manage and navigate urban mobility. By leveraging advanced technologies, data integration, and predictive analytics, these systems can provide accurate, real-time insights into traffic conditions, enabling efficient traffic management, improved travel planning, and enhanced user experiences.

The future of traffic prediction will be characterized by the integration of diverse data sources, including sensors, cameras, connected vehicles, and social media feeds, to create a holistic understanding of traffic patterns. Machine learning and artificial intelligence algorithms will continue to evolve, allowing for more accurate predictions and adaptive models that can adapt to changing conditions.

Intelligent traffic prediction systems will play a vital role in the development of smart cities, seamlessly integrating with other infrastructure components and enabling efficient resource allocation. They will facilitate the optimization of traffic flow, reduce congestion, and minimize the environmental impact of transportation.

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