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Traffic Prediction for Intelligent Transportation System Using Deep Learning

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***Abstract*: The most important challenge to sustainable mobility is persistent congestions of differing strength and duration in the dense transport networks. The standard Adaptive Traffic Signal Control cannot properly address this kind of crowding. Deep learning-based mechanisms have proved their significance to anticipate in adjective outcomes to improve the decision making on the predictions of traffic length. The deep learning models have long been used in many applications province which needed the identification and prioritization of adverse factors for a simplifying human life. Several methods are being popularly used to handle real time problems occurring from traffic congestion. This study demonstrates the capability of DL models to overcome the traffic congestion by simply allowing the vehicles through a signal depending on the length of vehicles. Our proposed method integrates a numeral of approach, intended to advance the cooperativeness of the explore operation. In this work, we implement the application to detect the number of vehicles in the images from the user and gives vehicles counts. To detect the vehicles, count here we are using the YOLO pretrained weights.**

***Keywords*: Traffic, YOLO, Deep Learning.**

1. Introduction

Over the last decade by resolving many complex and enlightened real-world issues. The application areas included almost all the real-world province such as healthcare, autonomous vehicle (AV), business applications, and image clarification. DL algorithms' learning is commonly depending on trial-and-error method quite opposite of conventional methods, which includes the coding instructions depends on decision statements like if-else. One of the most significant areas of DL is simplifying human problems, in many application areas including medical domain, governments every sector is showing their interest to introduce AI to their systems. Various models have wide appropriateness in working with the conditions of real time. There are lots of studies performed for dictating traffic using deep learning techniques such as image segmentation, object detection etc.., In particular, the study is focused on live traffic regulating near a traffic signal and study is also focused on the decreasing the waiting time depending on vehicle counts and early response. These systems can be very helpful in decision making to handle the present situations to guide early mediation to manage these traffic adjustments very successfully. This study aims to provide a better system which can be able to release the traffic depending on the count of vehicles. This project targets to develop web application in order to handle the "Traffic Congestion". Python-Flask is used as front end which is used to craft the user interface. MySQL is used as back end and used to craft the database and save the particulars. Anybody with a little computer knowledge can approach and deal with the software with ease; hence it can be termed user friendly.

Table 1
Literature survey

S.No.	Year	Authors	Title	Outcomes
1	(Claes et al., 2011)	Rutger Claes, Tom Holvoet, and Danny Weyns	A decentralized approach for anticipatory vehicle routing using delegate multiagent systems.	This paper presents a decentralized strategy for anticipative vehicle routing that is particularly utilized in large-scale effectual environments. The approach is based on delegate multiagent systems, i.e., an environment-centric coordination mechanism that is, in part, inspired by ant behaviour
2	(Shaw et al., 2020)	Mehul Mahrishi and Sudha Morwal	Index point detection and semantic indexing of videos - a comparative review. Advances in Intelligent Systems and Computing	AODV is one of the reactive routings needed to send data. However, in the deployment of tragedy situations, AODV has fragility that are unsafe to utmost environmental situations. In this study, communication will be modelled that leads to disruption due to disaster
3	(Zhang et al., 2019)	C. Zhang, P. Patras, and H. Haddadi	Deep learning in mobile and wireless networking: A survey.	In this paper we link the space between deep learning and mobile and wireless networking research, by showing a complete study of the unite between the two sectors. We first shortly launch necessary framework and state-of-the art in deep learning techniques with possibly applications to networking
4	(Wu et al., 2004)	Chun-Hsin Wu, Jan-Ming Ho, and D. T. Lee	Travel-time prediction with support vector regression.	We request support vector regression (SVR) for travel-time forecast and contrast its consequence to other criterion travel-time forecast approach using real highway traffic data. Since support vector mechanism have more conception capability and assured global minima for given training data, it is believed that SVR will execute well for time series analysis

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2. Proposed System

In the proposed system we are using the Yolo pretrained weights to detect the vehicles in the junctions, X and Y junction analysis we have done in this application. Basically, in x junction the vehicles can move in free left and in this we have taken two scenarios like if 1st lane has high vehicle count those vehicles can move in free left and straight with 3rd lane and also 3rd lane can also do the same thing. For 2nd and 4th lane also follow the same rule. For Y junction it follows on the three conditions, all three lanes follow individual rules like if 1st lane has high images, it can move free left and right the same thing happen for remaining lanes also.

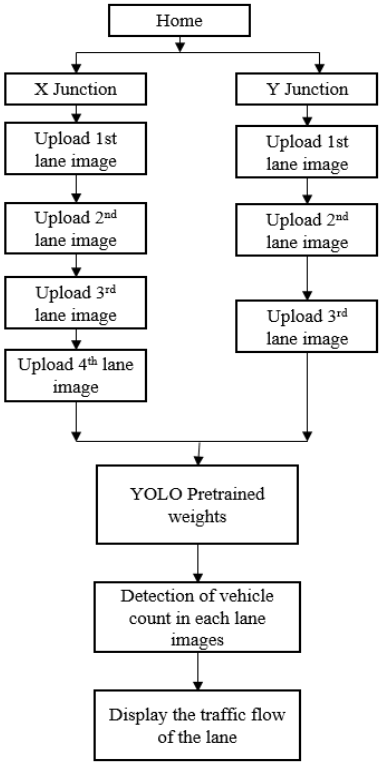

Fig. 1. Flow of the project

3. Conclusion

In this application, we have successfully created a system that controls traffic signals in X junction and Y junction automatically. This is developed in a user-friendly environment using Flask via Python programming. The system is likely to collect images from the user to clear signals for the lanes which has highest count of vehicles.

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