Use of Machine Learning in Traffic flow Estimation through DB Network and RF

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Abstract

Traffic forecasting is very important in network flow to reduce the congestion and to get the best and short way data packets transmission. Also traffic flow is depends upon the chunk size and type whether it is image, audio, video, its format, size, resolution, used compression techniques, encryption, decryption header and algorithm information. Like this the traffic on the Indian roads are also a very huge and complicated issue and depends on multiple conditions like location, priority, weather, road condition, time , place etc. By using deep learning approaches accurate detection of traffic flow is possible. In this article we discuss the deep learning methodology which uses DBM approach to generate unsupervised learning datasets and RF approach to generate the exact and accurate traffic flow along with threshold based technique.

Keywords: DBN, RF, DL,AI, Unsupervised learning.

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1.0 Introduction

A bunch of algorithms, statistical models are used in the machine learning process, to fulfill allrequirements successfully. The process of machine learning is very much useful for face detection,

medical diagnosis, traffic prediction process, etc. The server of traffic managing system is very much helpful for the determination of traffic ratio. GPS navigation is used to measure the ratio of traffic in a large city. In the machine learning process, the collection of data is used to reconstruct a clear idea of the current traffic. This process could make future traffic predictions in an organized form.

The prediction of traffic plays an important role in the “intelligent transportation system”. Nowadays, each and every small and large city faces traffic issues very badly. There are different types of roads issues that are coming due to traffic problems, so a clear prediction of traffic is mostly needed [1]. Smart technology and algorithm are used to make the prediction of traffic verymuch advanced.

The main aim of the research is to rearrange all the traffic predictions in an organized way. Thereare different types of route planning that are also involved in traffic prediction. The process of machine learning is used to make a simple and organized way of traffic prediction [26]

This research will develop traffic prediction by using the process of machine learning [2]. There are various types of objectives taking place in traffic prediction. The adjectives are:

- To introduce the importance of the machine learning process in traffic prediction
- To reveal the necessity of data collection, in the rearranging process of traffic system
- To approach available tools, that is used to traffic prediction currently
- To initiate currently available instrument for the traffic prediction process

In every research, there are several research questions that are faced in the reporting time. As withother research, this research has also some questions which are discussed below:

- Which factors are responsible for the traffic issues in the large city?
- What are the advantages of the machine learning process in traffic prediction?
- Will traffic problems vary with time and place?
- Are the current tools are efficient to predict traffic systems frequently?

The flow of traffic is different with the time and place; it depends on the capacity of the specific roads sometimes. There are different types of datasets is required to predict traffic in a specific place. The dataset of traffic policies, weather, and events is also needed to make a successful prediction. In the process of machine learning, data collection is very much an essential, so different type of the dataset is mostly needed. In the case of the inefficient dataset, this machine learning will not be appropriate [3]. The condition of the road is also very much an important factor

of the traffic vaticinator, so the dataset on the road conditions is also important. Sometimes, due to the lack of a dataset, the vaticinator will be wrong.

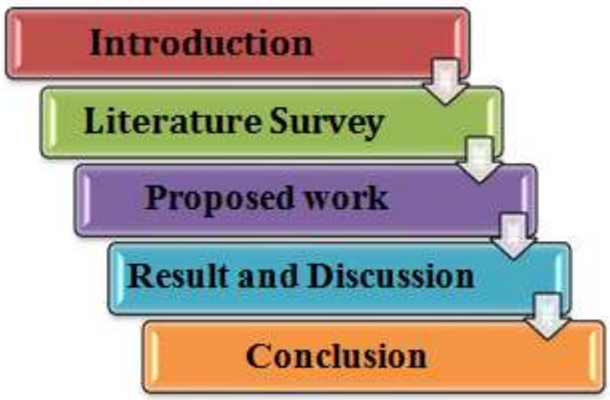

Figure 1: Block diagram of the research

The GPS system is much more useful in the case of traffic prediction. There are different types of tools are used to make a smart system of the prediction [4]. Machine learning is used in this project, to make the prediction much more efficient. There are different types of sensors that are also used to make the prediction system more successful. Cameras are also very much important tools of traffic prediction because various types of datasets come from the camera.

There are different types of techniques are used in the machine learning process for traffic prediction. The techniques of the random forecast, "deep Belief Network", Deep Auto encoder are used in the prediction. There are different types of the dataset is used that is available online. Sometimes due to the wrong dataset that is taken from the online prediction will be wrong [5].

2.0 Literature Survey

According to Andreoletti, *et al* 2019, the control of traffic is very much an essential and complicated factor nowadays because of huge traffic. The GPS system is also included in machine learning so different types of perspectives are also approached by the machine learning process. As stated by Yuan *et al 2018,* There are various types of challenging function are also taking place in the traffic system because of the time and place [6]. The process of machine learning will very much useful for the prediction of traffic because different types of evaluation are possible in this process. As stated by Jmila *et al 2017,* This research will be too much help to solve all the critical situations that occur due to traffic. There are different types of analysis that also take place in the machine learning process, the analysis of different types of data regarding traffic is one of them. According to Polese *et al 2020,* There are different types of algorithms are used in the machine learning system, the road forecasting, weather analysis are also take place [7]. The roads problemsare also the important factor of the traffic issues.

As stated by Kim *et al 2019,* Different types of datasets are also required in the prediction process, the DBN method is a very useful method in the machine learning system.

According to Chen, *et al* (2019) the traffic issue is one of the most important issues nowadays. As stated by Aqib *et al 2017,* there are different types of road accidents are occurred due to traffic problems, so the prediction of traffic is very much necessary [8]. All the conditions road, traffic, the weather is taking place in the prediction part of the weather. As researched by Wu *et al 2020,* there are different types of methods and mechanisms are proposed in machine learning. The GPS system is one of the most important functions of traffic prediction. The Adriano is used to make the smartest technology of the traffic prediction [9]. There are different types of tools are used in the machine learning process like sensors, cameras, Adriano, LED, etc. datasheet of each and everyfactor of the traffic prediction are mostly needed.

As stated by Nguyen *et al2018,* The weather-based dataset, the time-based dataset, and the place- based datasheet are mostly needed. Most of the time, this datasheet is available on the internet. According to Zhang *et al 2018,* sometimes due to the wrong datasheet, the prediction will be wrong so the genuineness of the datasheet is mostly important. "The Intelligent Traffic System" is very much helpful for traffic prediction using the machine learning process [10]. The improvement on the traffic prediction is mostly needed to avoid all the issues due to this. According to Choudhury*et al* 2018, the identification of automobiles is very much necessary for traffic prediction. In this research paper, "Deep Belief Network" is proposed. This method is proposed to reduce different types of dimensions in the datasheet of automobiles [11]. In the case of the machine learning process, the datasheet is a very important factor. All the production is possible, with respect to theappropriate datasheet. According to Dai *et al 2017,* the flow of traffic depends on the place, time, weather, and reads. Sometimes due to bad conditions of roads, the traffic issues increase. The DBN method is used in the machine learning process to generate unsupervised learning. This process is useful to identify various types of attributes in the case of traffic forecasting in an organized [12].As stated by Sirikul *et al 2021,* the performance of machine learning depends on the dataset, so inthis process datasheet is the most important factor. The DBN mechanism is much more efficient in the case of audion as well as image factor. The prediction will be genuine due to clear audio andimage and this method is useful for this two [13]. In this paper, the DBN method is proposed to make clear audio as well as clear image verification.

According to Li, *et al* 2018 in this research paper the random forest mechanisms are proposed. This algorithm is generally used for the purpose of classification in traffic prediction. Aqib *et al 2017* concluded there are different types of classification that are badly needed to predict traffic conditions properly. The main purpose of the random forest is to classify automobiles and count the automobiles in the traffic situation. As stated by Alajali *et al 2018,* the output results will be very much clear in the random forest method. In the machine learning process, the collection of data is used to reconstruct a clear idea of the current traffic [14]. There are different types of roads issues that are coming due to traffic problems, so a clear prediction of traffic is mostly needed.

As researched by Liu et *al* 2020, there are different types of threshold data is generated in the traffic prediction due to the RF mechanism. This algorithm is very much simple to apply, so this method is very much useful. If accuracy is needed in any system of traffic prediction, then the RF algorithm is very much essential. This algorithm is proposed "threshold-based techniques" for the accuracy and the improvement of the output result of the prediction of traffic [15]. This research paper will be very much useful for the accuracy of the output result of the prediction of traffic.

3.0 Proposed work

In this research, different types of algorithms and tools are used to make it smarter. There are various types of GPS systems is available to predict traffic flow. This computing technology is efficient in collaborating with the traffic flow system. In this project, The DBN and the RF algorithm are used to make this research very much efficient. This research is proposed an organized system of traffic prediction [18]. In this research a smart system of traffic prediction is proposed using machine learning. There are different types of smart tools and gadgets are used tocalculate the proper output. An appropriate datasheet is essential for the proper prediction of a specific place. In this research, online datasheet is used to predict traffic of a specific area [19]. In terms of traffic prediction, two most data driven methods are following traditional and statistical models of machine learning. However, these conventional but effective models only works for small amount of data sheet, but the need of time is to handle a large dataset. Hence, the project proposed the selection of CNN under deep learning model that involves complex architecture andplenty of features to work on [20].

Concept of dependent and independent variablesDependent variable:
Accuracy of prediction of traffic volume

Independent variable:Accuracy of provided dataQuality of sensor Appropriate algorithm

In this portion of the project, all the dependent variable and the independent variable is described clearly. The dependent variable is the accuracy of the prediction of traffic volume because it depends on all the independent variables. The independent variables of the projects are Accuracy of provided data, quality of sensor, appropriate algorithm. The datasheet is very much essential for the appropriate output result [16]. The quality of tools is also very much essential to perform this

process very much successfully. There are different types of algorithms are used in the process of machine learning, the applying algorithms will be appropriate for the accurate output result [17].

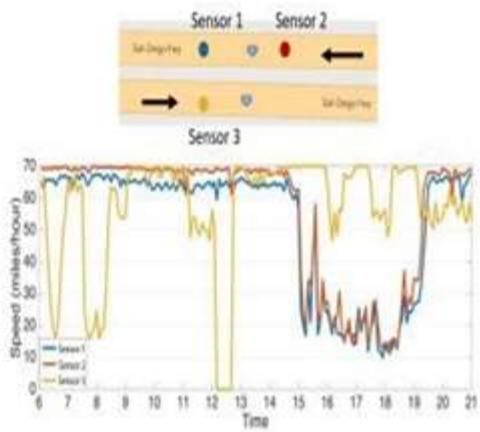

Figure 2: Complex spatial dependency among different traffic time seriesConceptual framework:

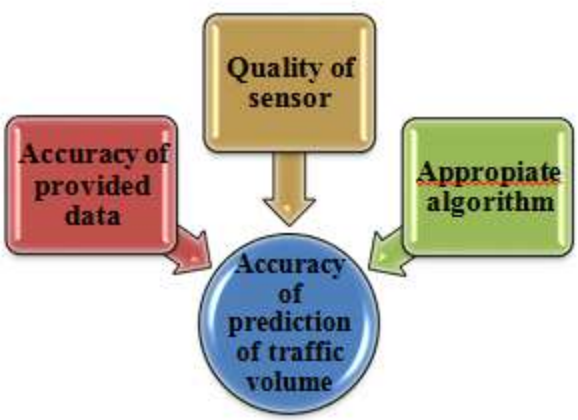

Figure 3: Conceptual framework of dependent and independent variables

4.0 Result and Discussion

The prediction of traffic is very much essential factor in the large city. Nowadays, due to the smart technology, prediction becomes much simpler. In this project, the process of machine learning is proposed. In the case of traffic flow, the DBN and the RF algorithms are used to predict the appropriate output [21]. The datasheet is essential for the "preprocessing steps" so it is collected online. The performance of the system is evaluated for the accuracy of metrics. The process of machine learning is very much useful for the prediction of traffic. The GPS system is also available in the machine learning system, so it will be much more efficient from the other traffic prediction

[22]. The prediction will be different in the different place, time, and weather. The traffic prediction is different in different and it is clearly visible in machine learning system.

5.0 Conclusion

At the end of the project, it can be concluded that the process of machine learning is very much useful for traffic prediction. There are different types of algorithms are used in the machine learning process like the DBN, RF, etc. Different types of algorithms are used for different purposes; the DBN is used for the learning that is unsupervised [23]. The RF algorithm is used forthe accuracy purpose of the traffic prediction. The threshold data is also proposed in the machine learning process. The output results will be categorized with this algorithm. There are different types of tools are used in the prediction system; the quality of the tools is genuine so the output results come appropriate. In the case of the machine learning process, the datasheet is a very important factor [24]. The output depends on the datasheet, if the datasheet comes genuine, then the output results will be appropriate.

The traffic problem became much more problematic due to the “huge population of traffic”. This computation technique is very much applicable to predict all the conditions of the traffic. The flowof traffic prediction is essential for the “smart transport system” [25]. There are different types ofalgorithms are approaching in this project. The collection of data is given from the online site andit is also proposed. Different types of distortions and noise comes in the system, but all the factorsare solved very carefully.

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