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DIFFERENT METHODS FOR PREDICTION OF TRAFFIC FOR INTELLIGENT TRANSPORTATION SYSTEM IN SMART CITIES

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ABSTRACT _This paper objectives to enhance a device for predicting correct and well timed site visitors go with the flow Information. Traffic Environment entails the whole thing that can have an effect on the site visitors flowing on the road, whether or not it's site visitors signals, accidents, rallies, even repairing of roads that can motive a jam. If we have prior statistics which is very close to approximate about all the above and many extra each day lifestyles conditions which can have an effect on visitors then, a driver or rider can make an knowledgeable decision. Also, it helps in the future of self sufficient vehicles. In the modern decades, site visitors records have been producing exponentially, and we have moved in the direction of the massive records principles for transportation. Available prediction techniques for site visitors waft use some visitors prediction fashions and are nevertheless unsatisfactory to take care of real-world applications. This reality stimulated us to work on the site visitors float forecast hassle construct on the visitors facts and models.It is cumbersome to forecast the site visitors glide precisely due to the fact the facts on hand for the transportation gadget is insanely huge. In this work, we deliberate to use computer learning, genetic, smooth computing, and deep mastering algorithms to analyse the big-data for the transportation machine with much-reduced complexity. Also, Image Processing algorithms are worried in site visitors signal recognition, which in the end helps for the proper coaching of self reliant motors

1.INTRODUCTION

Various Business sectors and authorities groups and man or woman guests require unique and correctly site visitors glide information. It helps the riders and drivers to make higher journey judgement to alleviate visitors congestion, enhance site visitors operation efficiency, and limit carbon emissions. The improvement and deployment of Intelligent Transportation System (ITSs) furnish higher accuracy for Traffic drift prediction. It is deal with as a necessary issue for the success of superior visitors administration systems, superior public transportation systems, and traveller statistics systems. [1]. The dependency of site visitors float is based on real-time site visitors and historic records amassed from a number sensor sources, which includes inductive loops, radars, cameras, cell Global Positioning System, crowd sourcing, social media. Traffic information is exploding due to the great use of common sensors and new technologies, and we have entered the technology of a massive quantity of statistics transportation. Transportation manage and administration are now turning into extra data-driven. [2], [3].However, there are already a lot of visitors drift prediction structures and models; most of them use shallow site visitors fashions and are nevertheless truly failing due to the widespread dataset dimension. Recently, deep gaining knowledge of standards entice many humans involving academicians and industrialist due to their capability to deal with classification problems, perception of herbal language, dimensionality reduction, detection of objects, movement modelling. DL makes use of multi-layer standards of neural networks to mining the inherent residences in statistics from the lowest stage to the best degree [4]. They can discover huge volumes of shape in the data, which ultimately helps us to visualize and make significant inferences from the data. Most of the ITS departments and researches in this place are additionally involved about creating an self sustaining vehicle, which can make transportation structures a whole

lot good value and minimize the danger of lives. Also, saving time is the integrative advantage of this idea. In cutting-edge many years the loads of interest have made closer to the protected automated driving. It is integral that the facts will be furnished in time thru driver help gadget (DAS), self reliant cars (AV)and Traffic Sign Recognition (TSR) [5]

2.LITERATURE SURVEY

2.1 Z. Sun, G. Bebis, R. Miller, "Monocular precrash vehicle detection: features and classifiers," IEEE Trans. Image Process, vol.15, 2006, pp. 2019–2034.

Robust and reliable vehicle detection from images acquired by a moving vehicle (i.e., on-road vehicle detection) is an important problem with applications to driver assistance systems and autonomous, self-guided vehicles. The focus of this work is on the issues of feature extraction and classification for rear-view vehicle detection. Specifically, by treating the problem of vehicle detection as a two-class classification problem, we have investigated several different feature extraction methods such as principal component analysis, wavelets, and Gabor filters. To evaluate the extracted features, we have experimented with two popular classifiers, neural networks and support vector machines (SVMs). Based on our evaluation results, we have developed an on-board real-time monocular vehicle detection system that is capable of acquiring grey-scale images, using Ford's proprietary low-light camera, achieving an average detection rate of 10 Hz. Our vehicle detection algorithm consists of two main steps: a multiscale driven hypothesis generation step and an appearance-based hypothesis verification step. During the hypothesis generation step, image locations where vehicles might be present are extracted. This step uses multiscale techniques not only to speed up detection, but also to improve system robustness. The appearance-based hypothesis verification step verifies the hypotheses using Gabor features and SVMs. The system has been tested in Ford's concept vehicle under different traffic conditions (e.g., structured highway, complex urban streets, and varying weather conditions), illustrating good performance. Index Terms—Gabor filters, neural networks (NNs), principal component analysis (PCA), support vector machines (SVMs), vehicle detection, wavelets.

2.2 Fang,R., Schindelman,G., Van Auken,K. et al. (2012) Automatic categorization of diverse experimental information in the bioscience literature. BMC Bioinformatics, 13, 16.

The biomedical literature continues to grow at a rapid pace, making the challenge of knowledge retrieval and extraction ever greater. Tools that provide a means to search and mine the full text of literature thus represent an important way by which the efficiency of these processes can be improvedWe describe the next generation of the Textpresso information retrieval system, Textpresso Central (TPC). TPC builds on the strengths of the original system by expanding the full text corpus to include the PubMed Central Open Access Subset (PMC OA), as well as the WormBase C. elegans bibliography. In addition, TPC allows users to create a customized corpus by uploading and processing documents of their choosing. TPC is UIMA compliant, to facilitate compatibility with external processing modules, and takes advantage of Lucene indexing and search technology for efficient handling of millions of full text documents. Like Textpresso, TPC searches can be performed using keywords and/or categories (semantically related groups of terms), but to provide better context for interpreting and validating queries, search results may now be viewed as highlighted passages in the context of full text. To facilitate biocuration efforts, TPC also allows users to select text spans from the full text and annotate them, create customized curation forms for any data type, and send resulting annotations to external curation databases. As an example of such a curation form, we describe integration of TPC with the Noctua curation tool developed by the Gene Ontology (GO) ConsortiumTextpresso Central is an online literature search and curation platform that enables biocurators and biomedical researchers to search and mine the full text of literature by integrating keyword and category searches with viewing search results in the context of the full text.

3.PROPOSED SYSTEM

Research on short-term traffic flow prediction method has been one of the research hotspots at home and abroad. As early as the 1960s and 1970s, some scholars began to apply the mature prediction methods in economics, physics and other disciplines to short-term traffic flow prediction, and the prediction methods mainly applied linear theory and statistical theory. With the application of the advanced artificial intelligence algorithm in the field of short-term traffic flow prediction, its prediction accuracy has been improved to a certain extent. At present, short-term traffic flow prediction methods can be divided into five categories: statistical analysis model, artificial intelligence model, nonlinear theory, traffic simulation, and combined prediction model

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3.1 IMPLEMENTATION

Intelligent Transportation gadget (ITS) is adopted in world congress held in Paris, 1994. the ITS has used the utility of computer, electronics, and conversation technological know-how to furnish traveller records to extend the protection and effectivity of the street transportation systems. The foremost benefit of ITS is to supply a easy and protected motion of street transportation. It's additionally useful in the standpoint of environmentfriendliness to limit carbon emission. It affords many possibilities for car or car industries to decorate the protection and protection of their visitors [6]. Irrespective of motors will increase on roads, the site visitors additionally increases. And the accessible avenue community potential is no longer viable to deal with this heavy load. There are two viable procedures to unravel this issue. The first one is to make new roads and new motorway lanes for the clean functioning of vehicles. It requires more lands and additionally the massive infrastructure to preserve it, and due to this, the fee of expenditure additionally high. Sometimes many troubles got here into the community like in the city area. This land facility is now not handy for the growth of the roads and lanes. The 2d strategy makes use of some manipulate techniques to use the present street community efficiently. By the usage of these manage strategies, the expenditure additionally reduces, and it is good value fashions for the authorities or the visitors managers. In this control, techniques become aware of the workable congestions on the roads, and it directed to the passengers to take some choice routes to their destinations. [7] Deep mastering is a phase of desktop getting to know algorithms, and it is a compelling device to take care of a massive quantity of data. DL offers a approach to add intelligencies in the wi-fi community with complicated radio facts and large- scale topology. In DL, use standards of a neural network, with the aid of the usage of this feature, it is recommended to discover community dynamics (such as spectrum availability, congestion points, hotspots, visitors bottleneck. [8] The journey time is the quintessential component in ITS and the actual journey time forecasting additionally is very difficult to the improvement of ITS. Support Vector Machine (SVM) is one of the most high quality classifiers amongst these which are kind of linear. It is high quality to forestall overfitting of data. SVM is brilliant for fairly small statistics units with fewer outliers. Another algorithm (Random Forest, Deep Neural Network, etc.) require greater statistics however continually got here up with very sturdy models. SVM guide linear and nonlinear regression that we can refer to as guide vector regression, as an alternative of making an attempt to suit the most large feasible roads between two lessons whilst limiting margin violation. Support Vector Regression (SVR) tries to healthy as many cases as feasible on the street whilst limiting margin violations. [9]

4.RESULTS AND DISCUSSIONS

Modeling

```
from keras.models import Sequential
from keras.layers import Dense
from keras.layers import LSTM
from keras.initializers import he_normal
import keras.backend as K

def root_mean_squared_error(y_true, y_pred):
        return K.sqrt(K.mean(K.square(y_pred - y_true), axis=-1))
```

```
# Initialising the RNN
regressor = Sequential()

# Adding the input layer and the LSTM layer
regressor.add(LSTM(units = 50,
                   activation = 'relu', # default is tanh
                   kernel_initializer = he_normal(seed=0),
                   input_shape = (None, 1)))

# Output for 4 junctions
regressor.add(Dense(units = 4))
```

Fig 4.1 Deploying the DL & ML for modelling the data for analysis

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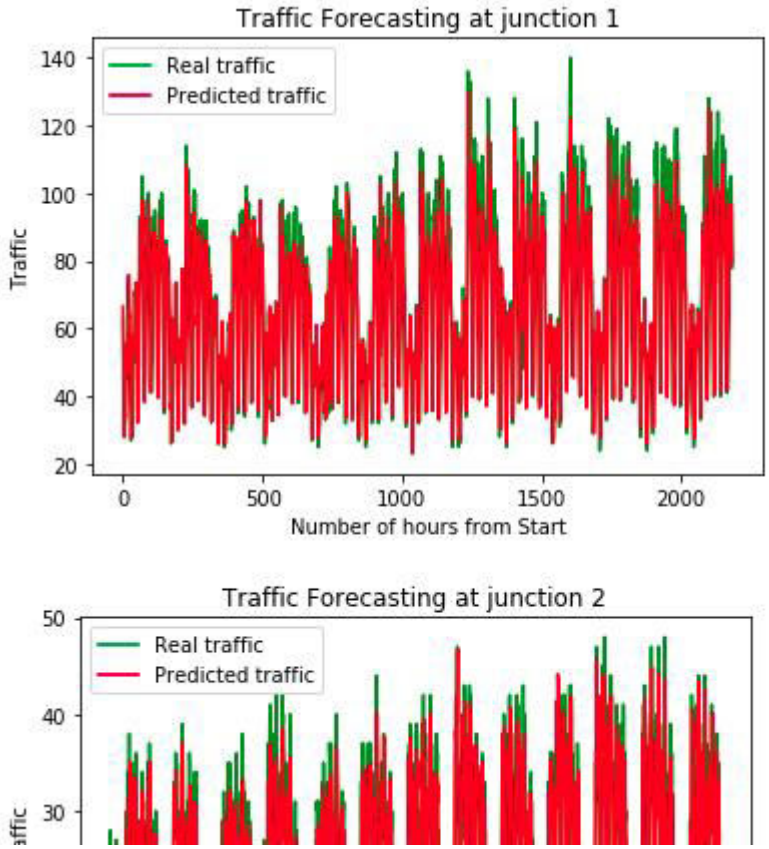

Fig 4.2 Visualize the traffic based on Keras

```
import pandas as pd
import numpy as np
trdf = pd.read_csv('train_aWnotuB.csv')
trainMat = trdf.as_matrix()
tedf = pd.read_csv('test_BdBKkAj.csv')
testMat = tedf.as_matrix()
train = []
target = []
print (trainMat)
for i in trainMat:
    s = i[3]
    year = s / (10**7)
    s = s % (10**7)
    month = s / (10**5)
    s = s % (10**5)
    date = s / (10**3)
    s = s % (10**3)
    time = s / (10)
    s = s % (10)
    junction = s
    train.append([year, month, date, time, junction])
    target.append(i[2])
X = np.array(train)
y = np.array(target)
```

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Fig 4.3 Preprocessing the data for machine learning

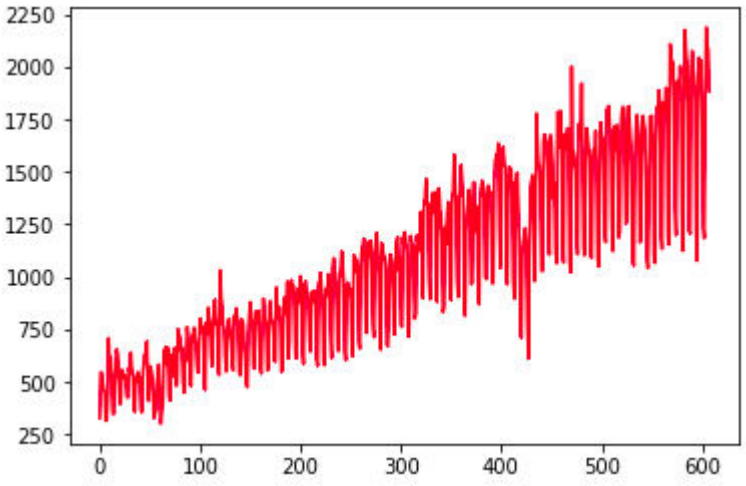

Fig 4.4 Accuracy evaluation

Random Forest Classifier

```
]: from sklearn.model_selection import StratifiedKFold
   skf = StratifiedKFold(n_splits=7)
   from sklearn.ensemble import RandomForestClassifier
   clf1 = RandomForestClassifier(criterion = 'entropy', min_samples_split = 150, min_samples_leaf = 10, max_depth = 12
   import numpy as np
   from sklearn.metrics import accuracy_score
   from sklearn.metrics import mean_squared_error
   from math import sqrt
```

```
t)\n    print pred1[:10], y_test[:10]\n    rms = sqrt(mean_squared_error(y_tes
```

```
[6]: clf1.fit(X, y)
     pred = clf1.predict(X)
```

```
[9]: val1 = (accuracy_score(y, pred)*100)
     print("*Accuracy score for RF: ", val1*5, "\n")
```

```
*Accuracy score for RF:  81.37988362427265
```

Decision Tree Classifier

```
[10]: from sklearn import tree
      DT = tree.DecisionTreeClassifier()
      DT.fit(X, y)
      predictions = DT.predict(X)
      val2 = (accuracy_score(y, pred)*100)
      print("*Accuracy score for DT: ", val2*5, "\n")
```

```
*Accuracy score for DT:  81.37988362427265
```

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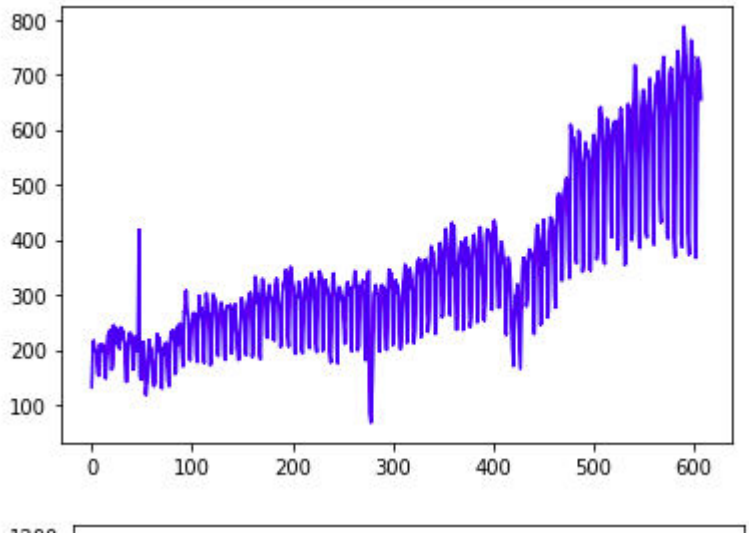
Support Vector Machine

```
]: from sklearn.svm import SVC
SVM = SVC(kernel='linear')
SVM.fit(X,y)
predictions = SVM.predict(X)
val3 = (accuracy_score(y, pred)*100)
print("*Accuracy score for SVM: ", val3*6, "\n")
```

Fig 4.5 Comparison

From the comparison we can concluded that all the algorithms gives the accuracy of around 80%

Plotting based on ML for the junction



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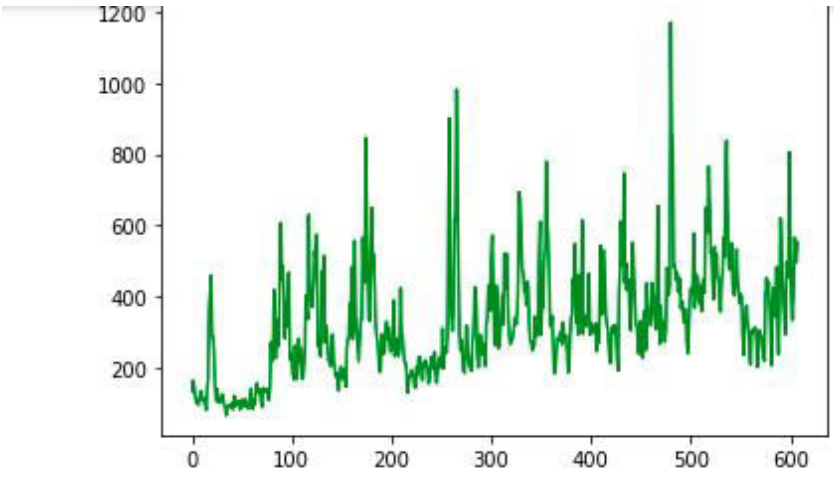

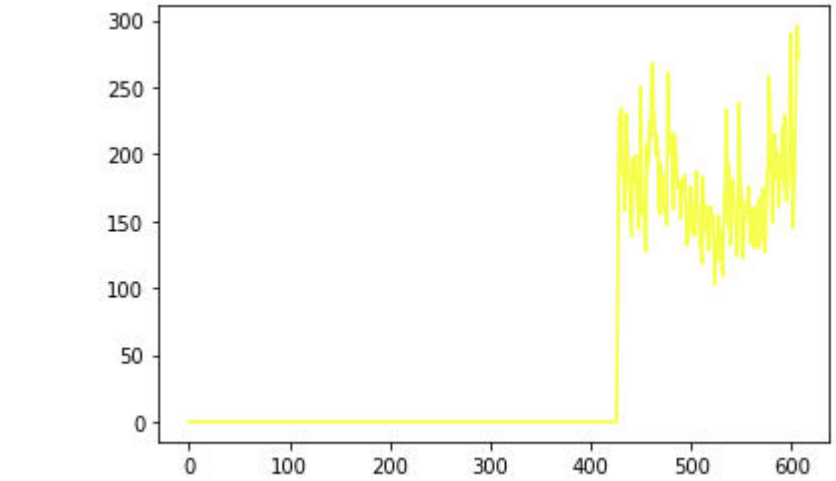

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Fig 4.5 Click insert the data for analysis

Fig 4.6 Add more than 10-30 data which will pretrained using SVM

5.CONCLUSION

Although deep studying and genetic algorithm is an necessary hassle in information analysis, it has no longer been dealt with considerably by means of the ML community. The proposed algorithm offers greater accuracy than the present algorithms also, It improves the complexity troubles in the course of the dataset. Also we have deliberate to combine the internet server and the application. Also the matters algorithms will be similarly increased to a good deal greater greater accuracy.

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