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FORCAST FUEL CONSUMPTION FOUND ON ENGINE MODEL SPECIFICATIONS

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Abstract: One of the most difficult challenges is reducing greenhouse gas (GHG) emissions from the transportation sector. The road transport sector, in particular, accounts for roughly 80% of total transportation energy demand and, due to its reliance on fossil fuels, is one of the world's most significant sources of GHG emissions ,Fleet managers use smart routing to direct their vehicles and reduce costs. Typically, vehicle manufacturers conduct mileage tests, which have an indirect impact on the environment by emitting gases. We consider the standard features of the engine and the condition of the road infrastructure, which can significantly affect fuel economy. The majority of these models, on the other hand, are based on standard drive cycles, are calibrated only for specific vehicles, or only provide a simplified mechanistic model. Regardless, These capture the physical mechanisms that influence fuel usage; nevertheless, they may be representative of only a few specific examples and may not accurately depict what occurs in reality. These include the driving mode, constant speed, acceleration, weather conditions, and so on, and using the same equations or methodologies in more general conditions may be computationally expensive or inaccurate due to the highly nonlinear phenomena involved. We can reduce greenhouse gas emissions by predicting a vehicle's mileage rather than testing it on the road.

Index Terms: **Environmental issues, Machine Learning, Deep Learning**

I. INTRODUCTION

Greenhouse gases represent serious environmental and health risks. They contribute to climate change by trapping heat, which has an impact on a variety of species in existing arid environments. Climate change produced by greenhouse gas emissions also leads to extreme weather, wildfires, droughts, and food supply disruptions .The highest portion of worldwide GHG emissions (25%) can be attributed to power and heat production, followed by agriculture, forestry, and other land uses (24%), industry (21%), transportation (14%), other energy (10%), and buildings (6%). (IPCC, 2014). Carbon dioxide (CO2) is the most important global GHG. Almost all of the rise in greenhouse gases in the atmosphere over the last 150 years has been attributed to human activity. In the United States, the main source of greenhouse gas emissions from human activity is the use of fossil fuels for power, heat, and transportation. Machine learning and optimization algorithms play an important role in reducing green house gases by predicting the emission of gases before they are emitted. This knowledge will help the person to know in advance and he will use less or stop using the emission of gases. As of now, we believe that fuel consumption prediction using deep learning will bring drastic changes to the manufacturing industry. However, developing such an application has presented us with some challenges to overcome, one of which is data for parameter in algorithm and selecting the best ones that are satisfiable by all manufacturers.

In the real world, many manufacturers are attempting to reduce greenhouse gas emissions by changing their manufacturing and engine designs. But none of them considered the test drives in industry; instead, they are considering a better method of test drives and increasing the number of test drives, such as test drives on different types of roads and in different climate conditions, and so on.

II. LITERATURE SURVEY

EMISSION OF GREEN HOUSE GASES FROM VECHILES: 1]Climate change is altering the world. Climate change is quickly becoming recognized as a tangible issue that must be addressed if major environmental consequences are to be avoided in the future. The physical signs of climate change–melting glaciers, rising sea levels, more severe storm and drought events, and hotter average global temperatures annually–have recently influenced public opinion. Transportation is a major source of CO2 and other greenhouse gas emissions from human activity. Fortunately, transportation technologies ,and strategies that can assist in meeting the climate challenge are emerging.

NEURAL NETWORK THAT AS HUMAN BRAIN: [2]An artificial neural network (ANN) is a machine learning method which is based on a biological neural network that is mostly used to estimate or approximate complex function with a significant number of inputs. ANN's may be used in nonlinear regression to reflect the complicated connection between variables .ANN's are frequently employed in a wide range of industries, including medical, transportation, and finance. ANN has been used to forecast

medical outcomes, model stock performance, and study diesel engine performance and exhausted pollution, When ANN was chosen as one of the prediction models in the study, the following benefits were investigated .Less formal statical training is required for

III.SYSTEM DESIGN

Proposed system: We propose a model in which a web-based application is created in which the user uploads vehicle features and receives the outcomes; even then, in the meantime, a data set is normalized and a model is saved in a location where both the model and the normalized dataset will connect to the web application. Initially, a deep learning system is created, trained, and evaluated across 1000 epochs with 10 batch sizes. After numerous epochs, deep learning algorithms will develop a linear regression model and reduce the error to less than one. Prior to this, all data will be adjusted to reduce overfitting, and the algorithm will determine the best fit line .A neural network with seven nodes

Architecture diagram :

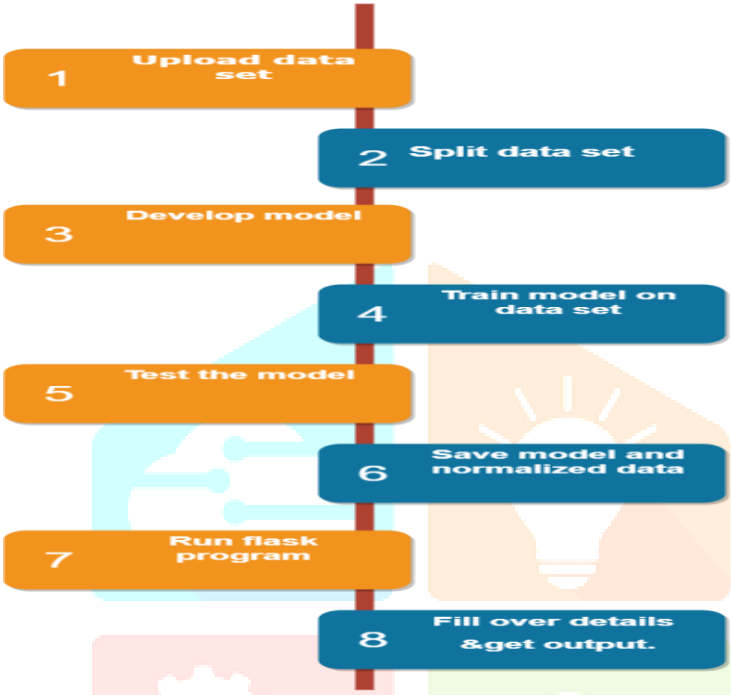

Fig .3.1 Architecture diagram

IV IMPLEMENTATION

STEP-1

Upload CSV Datasets- The user will upload the dataset.txt file, and if it is not in CSV file format, an error message will appear instructing the user to upload the file again, or the file does not exist, and if the file format validation is true, the user will not receive any errors, and the program will continue.

STEP -2

Train and test data split - The data is split into two unequal parts. Initially, the dataset is divided into X,Y variables, and these X,Y are split into X train X split and Y train Y test.

STEP-3

Model creation- A sequential artificial neural network with seven inputs, two hidden layers, and one output layer is created. The result of the Relu -activation function in each neuron will be a continuous value

STEP-4

Train the model-The model is trained over 1000 epochs with ten units as input at every epoch. The neural network model's error decreases with each epoch.

STEP-5

Test the model -Model testing is critical to the overall success of the project. It guarantees how well the model is learned and employs mean square error, r2square error.

STEP-6

Save the model and normalized data - The trained model is saved in a location specified by the model. pickle saves and saves normalized data These activities will be useful in the frontend program

STEP-7

Flask program-Flask is a Python front end development module that connects html with a saved model and normalized ed data. gives the outcome

V. RESULTS

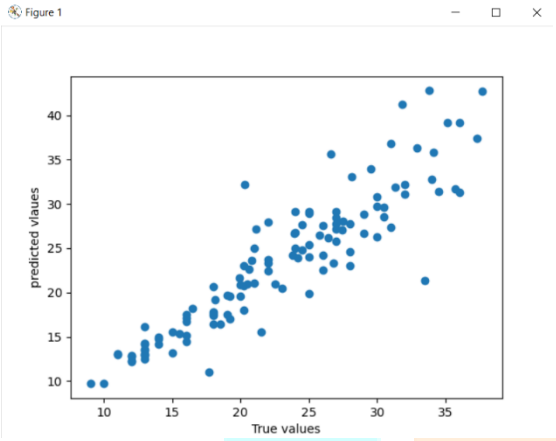

Fig.5.1 Predicted values over true values

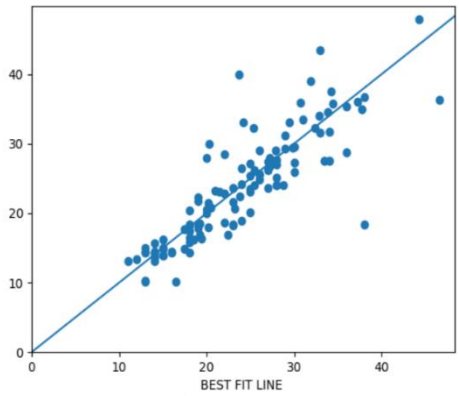

Fig.5.2 Best fit line

Output: Mileage is predicted over 1000 epochs in building model with errors reduced from 317 to 0.5 by using the fundamental parameters.

VI. CONCLUSION

The road transport sector, in particular, accounts for roughly 80% of total transportation energy demand and, due to its reliance on fossil fuels, is one of the world's most significant sources of GHG emissions. Fleet managers use smart routing to direct their vehicles and reduce costs. Typically, vehicle manufacturers conduct mileage tests that have an indirect effect on green house gases by emitting green house gases. These emitted green house gases increase the heat in the environment . These project have the potential to reduce gas emissions by replacing mileage tests in the manufacturing industry. Deep learning is used to take all of the engine's parameters and build an algorithm over them based on previous experiences, and a web application will assist in filling out details and calculating the engine's mileage and in the future, we will develop many more projects that will lead to a reduction in greenhouse gas emissions.

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