

# **Car Performance Prediction Using IBM Watson Machine Learning**

## **1. INTRODUCTION**

### **1.1. Overview**

The performance analysis of the car is based on the engine type, no of engine cylinders, fuel type, and horsepower, etc. These are the factors on which the health of the car can be predicted. It is an on-going process of obtaining, researching, analyzing, and recording the health based on the above three factors. The performance objectives like mileage, dependability, flexibility, and cost can be grouped together to play a vital role in the prediction engine and engine management system. This approach is a very important step towards understanding the vehicle's performance.

### **1.2 Purpose**

Predicting the performance level of cars is an important and interesting problem. The main goal is to predict the performance of the car to improve the certain behavior of the vehicle. This can significantly help to improve the system's fuel consumption and increase efficiency.

## **LITERATURE SURVEY**

### **1.2. Existing problem**

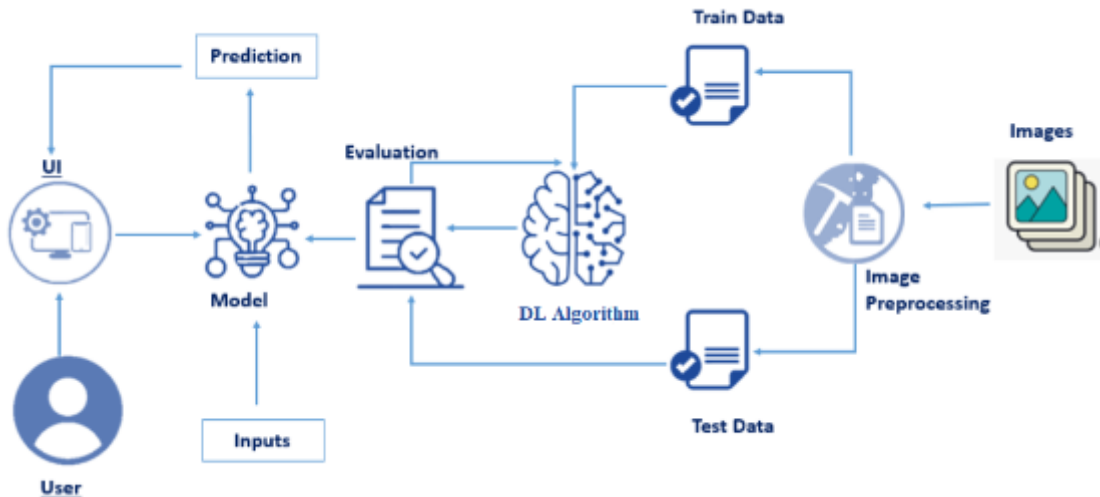
In recent years, deep learning has been used in various applications including the prediction of car performance. Various researchers introduced different classification algorithms, but they still face the problems of low accuracy and misclassification of other target objects. Hence, there is still a need to do more research on solving the above problems to predict the performance of the car.

### **1.3. Proposed solution**

In order to solve the problems for the accuracy of the classification system, we proposed a new classification model. First, based on the pretrained models, the models were fine-tuned with the public dataset we used. It is an important to analyse the factors using number of well-known approaches of machine learning algorithms like linear regression, decision tree and random forest to improve the vehicle performance efficiency. The range, durability and longevity of automotive traction batteries are 'hot topics' in automotive engineering. And here we consider a performance in mileage. To solve this problem, we will develop the models, using the different algorithms and neural networks. We will then see which algorithm predicts car performance(Mileage) with higher accuracy.

## **2. THEORITICAL ANALYSIS**

### **2.1. Block diagram**



## 2.2. Hardware/software design

### Software

- **Anaconda Navigator** : Anaconda Navigator is a free and open-source distribution of the Python and R programming languages for data science and machine learning-related applications. It can be installed on Windows, Linux, and macOS. Conda is an open-source, cross-platform, package management system. Anaconda comes with so very nice tools like JupyterLab, Jupyter Notebook, QtConsole, Spyder, Glueviz, Orange, Rstudio, Visual Studio Code. For this project, we will be using a Jupyter notebook and Spyder.

### Python packages:

- **NumPy** : NumPy is a Python package that stands for 'Numerical Python'. It is the core library for scientific computing, which contains a powerful n-dimensional array of objects.
- **Pandas** : pandas is a fast, powerful, flexible, and easy-to-use open-source data analysis and manipulation tool, built on top of the Python programming language.

- **Matplotlib:** It provides an object-oriented API for embedding plots into applications using general-purpose GUI toolkits
- **Keras:** Keras is an open-source library that provides a Python interface for artificial neural networks. Keras acts as an interface for the TensorFlow library. Up until version 2.3, Keras supported multiple backends, including TensorFlow, Microsoft Cognitive Toolkit, R, Theano, and PlaidML. Designed to enable fast experimentation with deep neural networks, it focuses on being user-friendly, modular, and extensible.
- **TensorFlow:** TensorFlow is just one part of a much bigger, and growing ecosystem of libraries and extensions that help you accomplish your machine learning goals. It is a free and open-source software library for data flow and differentiable programming across a range of tasks. It is a symbolic math library and is also used for machine learning applications such as neural networks.
- **Flask:** Web framework used for building Web applications

## **Hardware**

**Device name :** DESKTOP-J5SC39S

**Processor :** Intel(R) Pentium(R) Gold G5420 CPU @ 3.80GHz  
3.79 GHz

**System type :** 64-bit operating system, x64-based processor

## **3. EXPERIMENTAL INVESTIGATIONS**

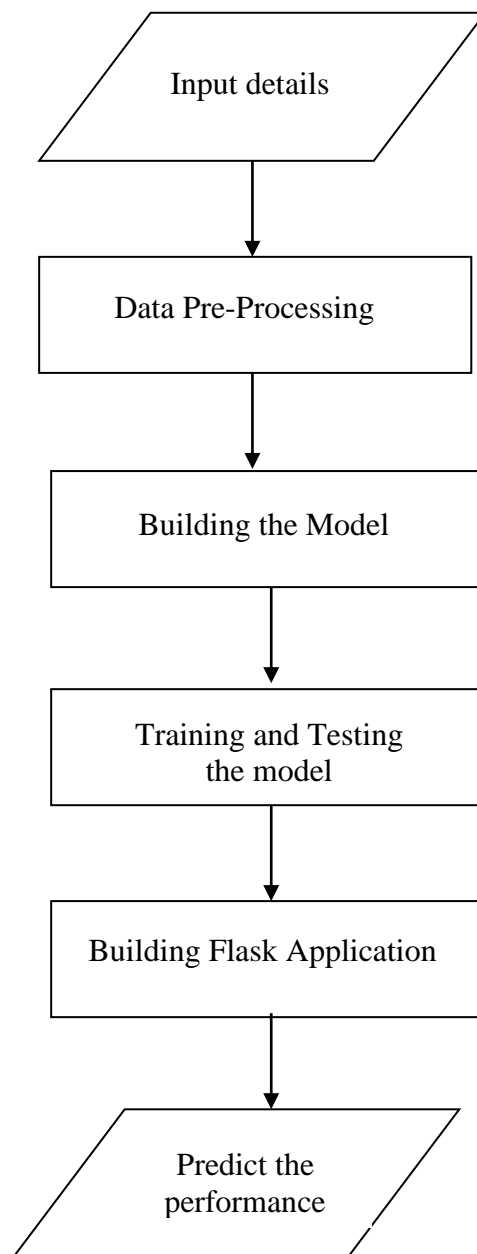
User interacts with the UI (User Interface) to upload the input features.

Uploaded features/input is analyzed by the model which is integrated.

Once a model analyses the uploaded inputs, the prediction is showcased on the UI.

Understand the problem to classify if it is a regression or a classification kind of problem. Understand how to pre-process/clean the data using different data preprocessing techniques. Understand to analyze or get insights into data through visualization. Applying different algorithms according to the dataset and based on visualization. Understand how to build a web application using the Flask framework.

#### **4. FLOWCHART**



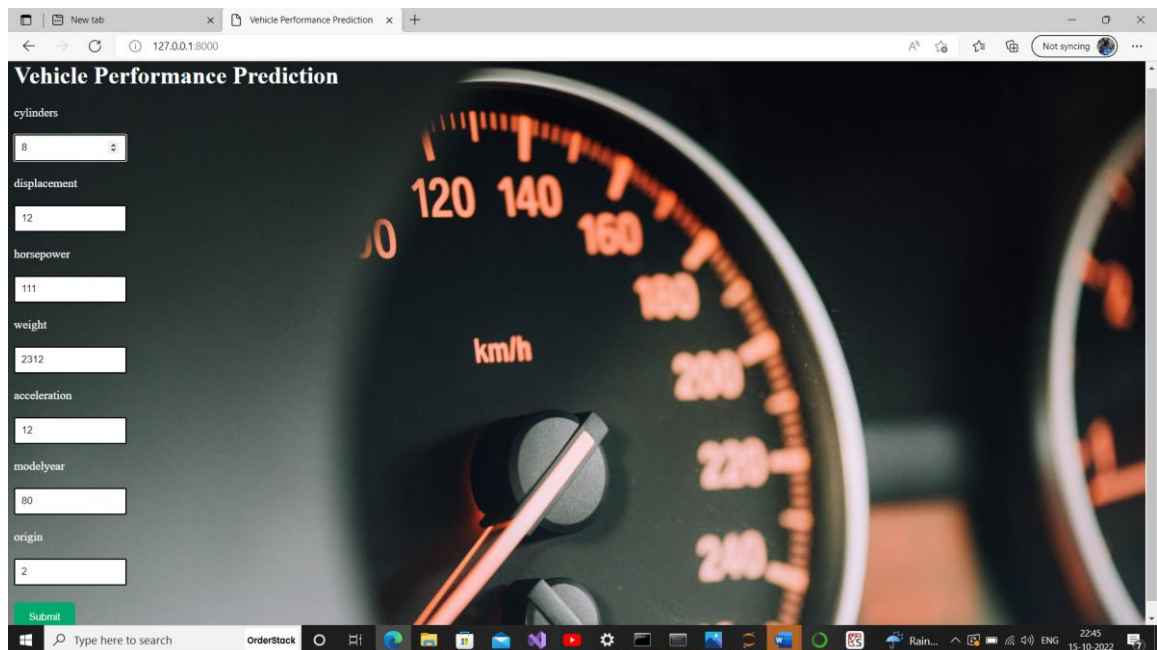
## 5. ADVANTAGES

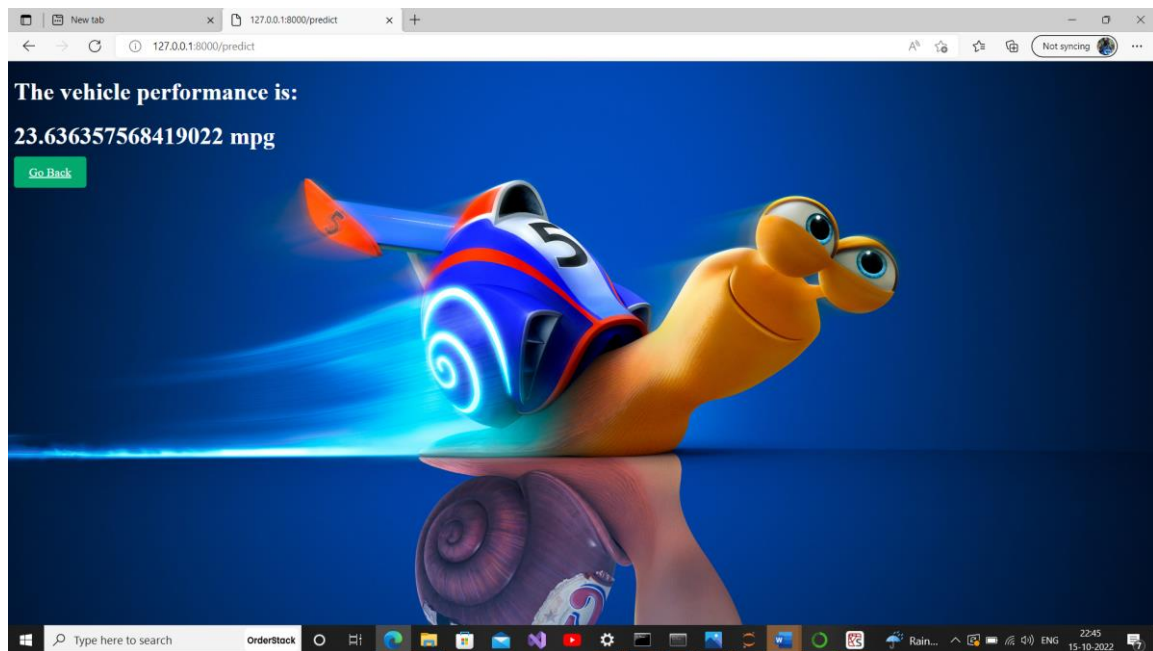
- Easy to use
- Time efficient
- Cost efficient

## 6. RESULT

The output of this project is if we are giving details of the car then it will predict the performance of the car.

### Screenshot





## 7. CONCLUSION

This project is aimed at predicting car's mileage (mpg) using a dataset which contains multiple features like car name, horsepower, number of cylinders and many more. This project uses car-performance dataset, all the preprocessing steps are applied on the data, to prepare the data to train the model..

## 8. FUTURE SCOPE

In future works, the proposed method will be improved by predicting the performance of the car using more advanced technology.

## 9. BIBILOGRAPHY

- <https://github.com/pranchal0409/Car-Performance-Prediction>
- <https://www.ijraset.com/research-paper/used-car-price-prediction-using-different-ml-algorithms>



## **10. APPENDIX**

### **Source code**

**[https://smartinternz.com/Student/guided\\_project\\_info/319293#](https://smartinternz.com/Student/guided_project_info/319293#)**