

EMISSION OF CO₂ FROM CARS

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INTRODUCTION:

- By trapping heat from the sun, greenhouse gases have kept Earth's climate habitable for humans and millions of other species.
- But those gases are now out of balance.
- Carbon dioxide being a key greenhouse gas, that drives global climate change, continues to rise every month.
- Between 2014 and 2016, global carbon emissions remained mostly flat, raising hopes the world's carbon output may have peaked for good.
- However, emissions began to rise again in 2017 and have continued growing.

LITERATURE SURVEY:

Existing Problem

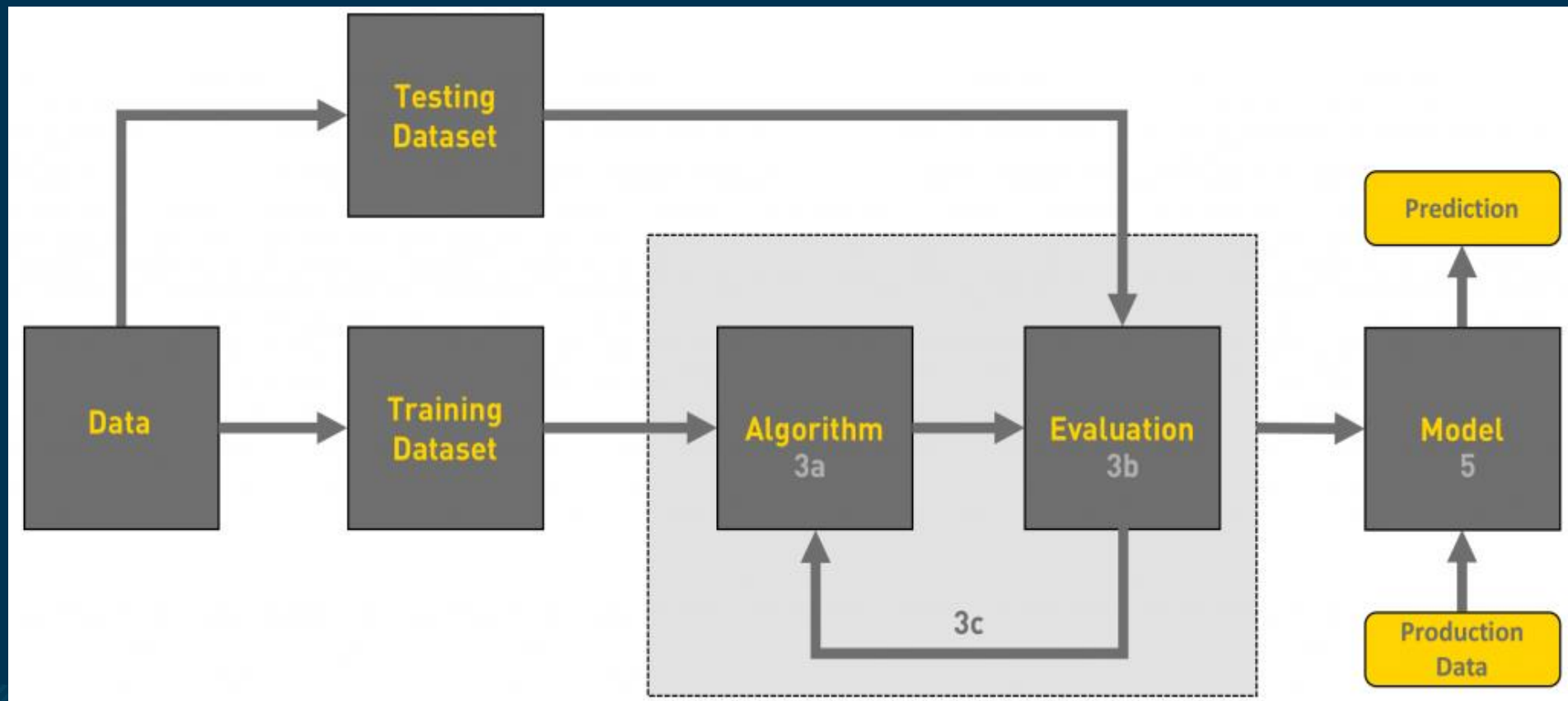
- The amount of CO₂ emission from the transport sector (including cars) accounts for about 20% of total CO₂ emissions.
- Accordingly, from the viewpoint of preventing global warming, reducing that proportion is a key issue.
- In regard to CO₂ emissions from cars, fuel economy standards are getting tougher all over the world, so improving fuel economy of cars is strongly desired.
- From now, it is considered that fuel economy of engines will be further improved by boosting engine efficiency and by hybridization (electrification) of cars.

Proposed Solution

- In this project, depending upon a car's features, we are going to predict the CO₂ emission rate of a particular car.
- So that if, the emission rate of that particular car is more than the threshold value then, the car's owner is warned and that car's details are sent to the particular RTA region head to seize the car.

THEORITICAL ANALYSIS

Block Diagram



Software Designing

- The project provides insight of CO₂ emission prediction model using machine learning.
- Machine Learning provides different techniques to train the machine based on experience.
- In this project, Supervised Machine learning-Regression technique is used for the prediction of CO₂ emission rate from cars.
- An iterative and continuous improvement approach will be adapted to achieve successful results.
- The results are validated using R2_Score technique. In the case of model building, random forest regression is used.
- A Random Forest is an ensemble technique capable of performing both regression and classification tasks with the use of multiple decision trees and bagging.
- The basic idea behind this is to combine multiple decision trees in determining the final output rather than relying on individual decision trees.

EXPERIMENTAL INVESTIGATIONS

- In this project, the CO₂ emission rate of cars is predicted by the model , using the dataset that includes the parameters that are required for the prediction of CO₂ emission rate.
- The dataset comprises of the various parameters that are collected about each car which can be used by the model for prediction.

RESULT

- As a result of prediction, the CO₂ emission rate of the car is known.
- From the predicted values, it is decided whether to sent the car's details to RTA region head or not.
- If the predicted value is above the fixed threshold, then it should be sent to RTA region else, it is considered to be safe.

ADVANTAGES & DISADVANTAGES

- The computational cost of training a random forest is quite low, but, it requires more computational resources and is less intuitive.
- It is one of the handy algorithm that as they support default hyper parameters.
- Though, the prediction process using random forests is time-consuming than other algorithms, it has the power to handle datasets with large dimensionality.

APPLICATIONS

- Using Random Forest Regressor, the value of CO₂ emitted in the cars are predicted using the entities like cylinders, fuel type and fuel consumption on various land lanes.
- This method builds multiple decision trees and merges them together to get a more stable and accurate prediction.
- It computes the score automatically for each feature after training and scales the result equals to one.

CONCLUSION

- High accuracy in prediction that gives information about the CO₂ emission rate and this is because the main goal is to predict the emission of the gas in different land lanes .
- This prediction can help the person to know whether the greenhouse gas produced is a disturbance to the environment or not.

FUTURE SCOPE

- The aim of the project is to predict the CO₂ emission rate for cars,depending on its features.
- Further, the project can be developed,where it can serve to be helping hand to reduce the CO₂ emission rates.
- An option of "Enhancement" can be added,where the application suggests the changes that can be done to the existing features of the car,so that,it emits lesser amount of CO₂.



BIBLIOGRAPHY

<https://www.nationalgeographic.com/environment/global-warning/greenhouse-gases/>

<https://ieeexplore.ieee.org/document/8664935>

2018 Fuel Consumption Guide

Output Screen

← → ↻ localhost:5000 ☆

CO2 EMISSION RATE FROM CARS

Premium Gasoline ▾

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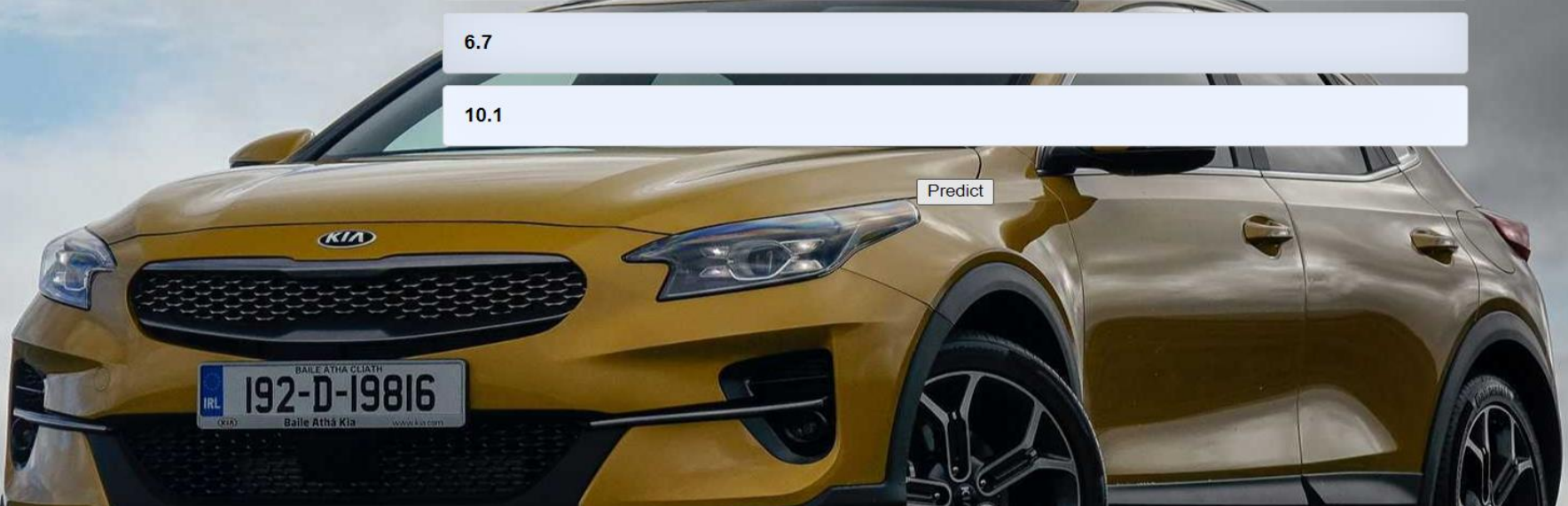
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Predict



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Output Screen





Thank You