



# **Electric Vehicle (EV) Price Prediction using Machine Learning**

## **IEEE BASE PAPER TITLE:**

**Analysis and prediction of electric vehicle costs: A machine learning-based approach**

## **IEEE BASE PAPER ABSTRACT:**

Although electric vehicles (EVs) have many benefits for protecting the environment and lowering emissions, their widespread adoption mainly depends on their price. With machine learning (ML) algorithms, costs can be predicted. This research aims to compare the performance of some of the most well-known ML algorithms to determine which algorithm will best predict the price of electric vehicles. To identify the key characteristics, we examined the literature to research the elements that determine the price of electric vehicles in order to estimate their cost. We theoretically compared these ML algorithms to validate our findings and then compared the output of this comparative study to the outcomes of the simulations.

## **OUR PROPOSED PROJECT ABSTRACT:**

The rapid adoption of electric vehicles (EVs) is reshaping the automotive industry, driven by technological advancements and growing environmental concerns. This project, titled "Electric Vehicle (EV) Price Prediction using Machine Learning,"



leverages advanced regression models to predict EV prices based on a comprehensive set of features. Utilizing Python as the backend coding language and deploying the solution through a Flask-based web framework with a user-friendly front end comprising HTML, CSS, and JavaScript, the project integrates advanced machine learning techniques to achieve accurate price predictions.

The study employs two robust regression models: GradientBoostingRegressor and ExtraTreeRegressor. The GradientBoostingRegressor achieved a Training Set Mean Absolute Error (MAE) of 0.1917 and a Test Set MAE of 1.4731, while the ExtraTreeRegressor achieved a perfect Training Set MAE of 0.000 and a Test Set MAE of 1.6941.

These models were trained and tested on a comprehensive dataset containing 14 key features: Brand, Model, Acceleration, Top Speed, Range, Efficiency, Fast Charge, Rapid Charge, Power Train, Plug Type, Body Style, Segment, Seats, and Price in Euro. These features encompass various aspects of EV specifications, performance, and market classification, providing a comprehensive basis for price prediction.

By leveraging these models, the project provides insights into the factors influencing EV pricing, offering valuable predictions that can assist stakeholders in making informed decisions regarding electric vehicle purchasing and market trends. The model's implementation as a web-based tool ensures accessibility and ease of use for various users, ranging from individual consumers to automotive industry analysts.

## **SYSTEM REQUIREMENTS:**

## **HARDWARE REQUIREMENTS:**

- System : Pentium i3 Processor.
- Hard Disk : 500 GB.
- Monitor : 15” LED.
- Input Devices : Keyboard, Mouse.
- Ram : 8 GB.

## **SOFTWARE REQUIREMENTS:**

- Operating System : Windows 10 / 11.
- Coding Language : Python 3.12.0.
- Web Framework : Flask.
- Frontend : HTML, CSS, JavaScript.

## **REFERENCE:**

Abdelfetah Ouadah, Belgacem Said Khaldi, Abdelhamid Iratni, Ahmed Hafaifa, “Analysis and prediction of electric vehicle costs: A machine learning-based approach”, 2024 ASU International Conference in Emerging Technologies for Sustainability and Intelligent Systems (ICETISIS), IEEE Conference, 2024.