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**Fuel-O: Fuel Consumption Prediction System for a Trip
Using Deep Learning**

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ABSTRACT

For many people, especially those who rely on personal vehicles for transportation, fuel consumption is a considerable expense. People may make better travel plans, minimize pointless driving, and spend less on fuel by predicting how much fuel they will need. Also, this can result in increased productivity, better stress management, and better time management.

This paper describes a research study on the prediction of fuel consumption using a multi-output deep neural network (DNN) based regression model. The study's objective is to create a model that can correctly predict fuel usage to complete a trip for various vehicle types under various conditions. Several parameters, including year, model, class, drive, transmission, engine cylinders, engine displacement, turbocharger, fuel type, and mpg, are included in the dataset used for training and testing the model. A mean squared error (MSE) loss function is used to train the model, which has an architecture made up of several hidden layers with rectified linear unit (ReLU) activation functions. K-fold cross validation and regularization has been used to avoid overfitting of the model. R-squared value have been used to measure the prediction model accuracy and it is 0.92.

Key Words: deep neural network, fuel consumption prediction, regression, neural network, deep learning