LITERATURE SURVEY

6. Modeling Freight Vehicle Type Choice using Machine Learning and Discrete Choice Methods   (2022)

INTRODUCTION:

The choice of vehicle type is one of the important logistics decisions made by firms. The complex nature of the choice process is because of the involvement of multiple agents. This study employs a random forest machine learning algorithm to represent these complex interactions with limited information about shipment transportation. The data are from Commercial Travel Surveys with information about outbound shipment transportation. This study models the choice among four road transport vehicle types: pickup/cube van, single-unit truck, tractor trailer, and passenger car. The characteristics of firms and shipments are used as explanatory variables. SHAP-based variable importance is calculated to interpret the importance of each variable, and shows that employment and weight are the most important variables in determining the choice of vehicle type. The random forest model is also compared with the multinomial and mixed logit models. The model prediction results on the validation data are compared.

ADVANTAGES:

Machine learning algorithms have been used to model freight mode choice.

This study develops a vehicle type choice model using a random forest (RF) machine learning algorithm.

It helps in the transportation-related domain show that RF has better prediction accuracy than other machine learning algorithms.

DISADVANTAGES:

The pattern is unclear for pickup/cube van and single-unit truck.

A longer tail to the right side but not to the left side for weight shows that extreme values of weight can significantly increase the chance of tractor trailer selection but cannot significantly reduce the chance of selection.

An increase in number of trees generally results in a decrease in error.

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