Determining the Socio-Economic Characteristics of Passengers in Urban Traffic Using Artificial Intelligence

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ABSTRACT

In travel demand forecasting models, socio-economic characteristics of people are used as input to the model. In this study, with the help of artificial intelligence models and especially deep learning models, it has been tried to extract these features from the travel patterns of people. The model that was chosen is the LSTM model. Age, income and gender are the most important inputs of this model. Different age, gender, and income groups may have specific travel behavior preferences, which are tried to be discovered by examining their travel behaviors. One of the important sources for determining people's travel patterns is mobile phone data that shows their daily movements. Due to the unavailability of mobile phone data of passengers, in this research, the NHTS National Household Travel Survey data set has been used. Using the obtained results, with the help of mobile phone data of passengers, their economic and social characteristics are obtained for use in travel demand models. The average distance traveled by men is 6.71 miles per trip, but the average distance traveled by women is 3.46 miles. Therefore, women have shorter trips than men. People between 20-30 years old have simpler travel patterns. Many of these people are still studying at university or are not working. By examining the travel patterns of people on the data, it was found that the middle income class has more trips and travels longer distances, so they have a more complex travel pattern.

Keywords: Travel Demand Model, Socio-Economic Parameters, Deep Learning, LSTM Model