

Identification of Factors in Road Accidents Through Classification and Regression Tree; Machine Learning Approach

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Road accidents are the most influential factors which cause untimely deaths for citizens as well the economic loss to the country while damaging properties. In order to overcome road accidents, planning and implementing counter-measures is an essential part of road safety. Decision making and judgments on road accidents are crucial when the damage of the road accident is high. Analyzing the patterns within the data is one way of establishing strategies on road safety. The main objective of this study is to accurately identify driver characteristics and the ages which are more prone to accidents by using imperative factors towards it. CART (Classification and Regression Tree) has used to accurately predict the respective factors and age within the selected Colombo – Batticaloa road. Human behavior identified using CART was analyzed with 8 characteristics (speeding, negligent driving, error of judgment, influenced by alcohol/drugs, fatigue/fall asleep, inattentiveness, poor eyesight, sudden illness) while age was critically analyzed with 10 age groups from 15-80 years. The used CART approach showed accuracies of 80.06% and 91.19% with the factor of identifying the age. Results revealed that speeding, wrong judgment and negligent driving as the main human characteristics, which lead to road accidents and drivers who are at age group 25- 34 years are most vulnerable to accidents. In order to reduce the accident risks the drivers should be critically tested, when issuing the driving license. The study provides the information needed to guide the relevant decision-makers in adopting suitable measures to reduce the accident rate.

Keywords: CART