

## **A Driver Assistant System Using Behavior Patterns and Fuzzy Logic to Enhance Safety**

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### **Abstract**

In this article, the purpose of using learning algorithms is to create an advanced system of the driver's assistant in order to provide the driver with the driving safety by considering general and personal driving features. We used the decision tree algorithm to represent such a system. At as the first step, appropriate data are collected. The aim is to select the factors influencing the design of the warning system. In the next step, we prepared the data. Then outlier data is differentiated using categorical algorithms. In the next step, input data is prepared using a fuzzy device. The system is a Mamdani fuzzy system. In the last step, we determined the root, branch, and leaves of the decision tree model using the entropy method. In this paper, the rules are extracted from 5 attributes along with a target variable which has four modes. The rules of the fuzzy system are implemented on a local database and the results are provided. Finally, the results of the designed model are compared with the results of the previous.

Keywords: Decision tree, Fuzzy logic, Driving learning algorithms, Mamdani fuzzy system, Entropy method

### **1. Introduction**

Nowadays, with the ever-increasing development of traffic engineering science in the world, many methods and tools have been developed for traffic management. Intelligent Transportation Systems (ITS) (El Faouzi, Leung, & Kurian, 2011; Zhang et al., 2011) are one of these tools. Intelligent transportation systems are a new concept in the field of traffic engineering, which plays a very important role in the security and dynamism of transportation. These systems have increased the efficiency of the transportation and traffic network, which its expansion can solve many transportation problems. In fact, in the intelligent transportation system, the assessment and monitoring of driving behavior, especially for public transportation drivers, including speed, driving experience and

atmospheric conditions, have a significant impact on identifying and employing safe drivers in passenger fleet management. On the other hand, monitoring and assessing through encouragement and punishment can reduce risky behaviors, and increase the inclination to drive safely (Rahbari D., 2014; Placzek B., 2014).

### **2. Procedure**

#### *2.1 The selected features*

The selected features for developing the methods are as follows:

Age: which has three categorizations, young, middle-aged, and old.