

EXTENDED ABSTRACT

Modelling and Analyzing the Severity of two-lane Highway Crashes Using the Spatial Data mining, Case Study: Old Corridor of Qazvin-Loshan

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1. Introduction

Identifying the effective parameters on the increase of the severity of the accidents in the two-lane highway and also the spatial analysis of the accidents occurring in them, could lead to the reduction of the road accidents of this road. Based on this, the present research, in addition to identifying sections with high crashes, it also identifies the factors affecting the severity of accidents.

2. Methodology

To do so, In this study, first, in order to study the clustering and spatial distribution of the accidents of Old Corridor of Qazvin-Loshan Freeway during the period from 2011 to 2016, the Geographic Information System's spatial functions such as Getis-Ord G^* Autocorrelation and kernel density functions were Used.

In the next phase of the study, in order to study the factors affecting the severity of accidents, the Classification and Regression Tree was used on accidents occurring in the whole axis and specifically in the horizontal curves with high crashes.

3. Results and discussion

The preliminary results of the spatial analysis showed that the focus of accidents in horizontal curves was greater. According to this achievement, as mentioned in the previous section, we used Classification and Regression Tree to identify the factors affecting the severity of accidents occurring in the whole axis and specifically in the horizontal curves with high crashes. The results of this part of the study show that the type of accidents (overturning and falling, exit from the road, Multi-vehicle collisions, etc.) and type of crashes deal with the coefficients of the importance of independent variables are 100 and 16.4 percent for the total axis and 100 and 8.28 percent for horizontal curves, are the most important factors in the severity of accidents of this axis. The study of the relative importance of other variables in the proposed model shows that the type of road and type of terrain is one of the effective factors in increasing the accident severity in the old corridor of Qazvin-Loshan. In addition, the results of modeling on horizontal curves crashes showed that road surface marking, especially of continuous type, causes severe fatal accidents.

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4. Conclusions

The results showed that the integration of GIS spatial functions with non-parametric decision-making tree-based data mining analysis, which is capable of simultaneous modeling of quantitative and qualitative data, is used to determine the factors affecting the severity of accidents and to spatial analyze the patterns of accidents used in two-lane highway, is effective and efficient.

5. References

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