

Macrocategoria: Geometria e Sicurezza.

Titolo articolo: Parametric and Non-Parametric Analyses for Pedestrian Crash Severity Prediction in Great Britain.

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Abstract: The study aims to investigate the factors that are associated with fatal and severe vehicle–pedestrian crashes in Great Britain by developing four parametric models and five non-parametric tools to predict the crash severity. Even though the models have already been applied to model the pedestrian injury severity, a comparative analysis to assess the predictive power of such modeling techniques is limited. Hence, this study contributes to the road safety literature by comparing the models by their capabilities of identifying the significant explanatory variables, and by their performances in terms of the F-measure, the G-mean, and the area under curve. The analyses were carried out using data that refer to the vehicle–pedestrian crashes that occurred in the period of 2016–2018. The parametric models confirm their advantages in offering easy-to-interpret outputs and understandable relations between the dependent and independent variables, whereas the non-parametric tools exhibited higher classification accuracies, identified more explanatory variables, and provided insights into the interdependencies among the factors. The study results suggest that the combined use of parametric and non-parametric methods may effectively overcome the limits of each group of methods, with satisfactory prediction accuracies and the interpretation of the factors contributing to fatal and serious crashes. In the conclusion, several engineering, social, and management pedestrian safety countermeasures are recommended.

Keywords: Artificial neural networks; Association rules; Classification trees; Ordered logit; Pedestrian crashes; Random forests; Random parameter multinomial logit; Support vector machines.

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