Driving Risk Assessment for Ride-hailing Drivers

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Abstract: The rise of ride-hailing services in the last decade has opened a new mode of travel and provided work opportunities for millions of drivers. Our study evaluates crash risk factors associated with ride-hailing drivers, including crash history and ride-hailing operational characteristics. We utilize the Poisson Generalized Additive Model to accommodate the potential nonlinear relationship between the logarithm of crash rate and risk factors. Results show that crash history, the percentage of long-shift orders, driving distance, operations during peak hours, years of being a ride-hailing driver, and passenger rating are significantly associated with crash rate. Among them, several factors display nonlinear relationship with the logarithm of crash rate. The SHapley Additive exPlanation method is used to explain and visualize the contribution of each risk factor. The results indicate that crash history, years of being a ride-hailing driver, and total driving distance are the leading factors contributing to ride-hailing driver crash risk. The results of this study provide valuable information for understanding crash risk for ride-hailing drivers and for developing safety countermeasure and ride-hailing driver education programs.