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学位（博士）論文要旨

(Doctoral thesis abstract)

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論文題目 (Title)	Risk Predictive Collision Avoidance System for Intersection Right Turn: System Development and Validation
論文要旨（2000 字程度） (Abstract (400 words)) ※欧文・和文どちらでもよい。但し、和文の場合は英訳を付すこと。 (in English or in Japanese) <p>Reducing traffic accidents has been one of the most imperative topics for automobile industries for long decades. According to the statistics on traffic accidents in Japan, most fatal traffic accidents have occurred in the cities. The city driving requires the driver to correctly predict the risk not only on the visible hazards but also on the possibilities such as a sudden lane change or a darting-out from the blind spot. We call these possibilities the potential risks. It is known that skilled drivers can drive the city safely and comfortably by predicting the potential risks and handling the vehicle properly to reduce the risks. We define these driving skills as risk predictive driving. This risk predictive driving is imperative factors to diminish the traffic accident in the city area.</p> <p>The latest development of the Advanced Driver Assistance Systems (ADAS) could enhance the comfortability and traffic safety of automobiles. In the aspect of comfortability, a lot of research have made on driving assistance for no-risk conditions such as highway driving. In terms of safety as well, plenty of studies on emergency functions such as emergency braking, emergency steering, and stability controls. However, although risk predictive driving scenarios are the meaningful aspect to diminish the traffic accident in city driving, many of those studies on ADAS did not undertake the risk predictive driving scenarios.</p> <p>One of the essences of developing the risk predictive driver assistance systems is to be consistent in terms of the “safety” and the “driver acceptance” at the same time. Because once the system becomes too conservative for safety, the driver may not accept the driver assistance system. Usually, the “safety” and the “driver acceptance” are in the trade-off relationships.</p>	

Our research project addressed the risk predictive scenario in the intersection right-turn and developed an advanced driver assistance system that predicts the risk of the darting-out from a blind spot. Our proposal ADAS enables the vehicle to decelerate to a safe speed when there's the risk for a darting-out object while making a right-turn at the intersection. In addition to that, this paper proposes a methodology on the vehicle trajectory prediction for the driver assistance system. This method realizes to predict the smooth and high accuracy intersection turning trajectories in the real-time calculation rate. To evaluate the effectiveness of the risk predictive driver assistance systems, the evaluations of the "safety" and the "driver acceptance" are indispensable. This paper presents a methodology to evaluate both the safety and the driver acceptance from the full-vehicle simulations and the driver subjected experiments.

(英訳) ※和文要旨の場合(400 words)