Distance Perception of Car Drivers about Near-Field Object with Different Rear Vision Systems

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ABSTRACT

Traffic environment of Taiwan is packed with the motorcycle shuttling back and forth everywhere. At this situation, drivers’ distance perception between the car and the outside motorcycle is very important. However, because of the hindering of car body structure, most drivers may not be able to have a correct distance perception and make the accident happened more easily. Currently nearly all car manufacturers are using camera-based rear vision system helping drivers have a correct distance perception to replace side rearview mirror. But how to operate the camera-based rear vision system effectively is an issue worth systematic studying. A spherical convex side mirror（radius 1400mm） and two different camera-based rear vision systems （wide-angle lens and normal lens） were evaluated as passenger-side rearview mirror in a field test to find drivers’ actual view field 、lane change judgment and distance perception about near-field object. Subjects’ distance perceptions for object seen in rear vision systems were measured by magnitude estimation in a static field setting. The results show that different rear vision systems do influence the perception of the distance. Driver judge the distance using convex mirror cause underestimation, wide-angle lens cause overestimation when motorcycle lies in the same position. It is relatively close to the real distance to use the standard lens.

Keywords : Passenger car, Driver, Rear vision, Distance perception, Camera

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