

Evaluation of a generic warning for multiple intersection assistance systems

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Abstract

Intersections are accident hotspots and thus the development of Advanced Driver Assistance Systems (ADAS) is promoted within the scope of research projects like PReVENT INTERSAFE¹ and Vehicle Infrastructure Integration (VII)². Many of these future assistance systems follow a common warning scheme already implemented in present ADAS like forward and side collision warning systems. The driver's attention is directed to the source of the threat by presenting a visual/acoustical alert that might be combined with a haptic feedback.

Even with only these two functions implemented in a vehicle, it is a challenge to avoid unwanted side effects due to inconsistent or simultaneous warning messages. Additional intersection assistance systems will increase the demand for integration and prioritization of ADAS information even further.

Introducing a generic warning similar to the "master alert" used in aviation might be an approach to simplify warning management within a car, where multiple warning systems share a common warning scheme. This avoids the need to prioritize different warning systems but also imposes the interpretation of the warning within the current driving context on the driver.

In order to verify that the loss of distinguishability of visual alerts when using a generic warning has no negative effect on driving performance, two video scenario experiments were conducted in a driving simulator. In both experiments, videos of a normal urban traffic environment ending with a critical situation at an intersection were presented. In the first experiment (N=60), the comprehension of the cause of the warning was compared under the two conditions "generic warning" and "specific warnings". In the second experiment (N=40), reaction time was measured by allowing the participants to freeze the video using the brake pedal.

¹ http://www.prevent-ip.org/en/prevent_subprojects/intersection_safety/intersafe/

² <http://www.its.dot.gov/vii/>