

Seeing is believing: Eye-tracking technology could help make driving safer

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Researchers at the University of Missouri are looking at the importance of keeping your eyes on the road with two new uses of eye-tracking technology in relation to vehicle collision avoidance warnings and rear-end accidents. Credit: University of Missouri

"Keep your eyes on the road."

With the recent advances in [vehicle](#)-assisted [safety technology](#) and in-car displays, this old adage has a new meaning, thanks to two new applications of eye-tracking technology developed by researchers at the University of Missouri.

Designing a better collision avoidance warning

Observing how someone's eyes change—specifically the pupil—while they respond to an alert given by a vehicle collision avoidance [warning](#) could one day help scientists design safer systems.

"Prior to a crash, drivers can be easily distracted by an alert from a collision avoidance warning—a popular feature in new vehicles—and we feel this could be a growing problem in distraction-related vehicle crashes," said Jung Hyup Kim, an assistant professor of industrial and manufacturing systems engineering in the MU College of Engineering. "Therefore, a two-way communication channel needs to exist between a driver and a vehicle. For instance, if a driver is aware of a possible crash, then the vehicle does not have to warn the driver as much. However, if a vehicle provides an alert that, by itself, creates a distraction, it could also cause a crash."

Kim and Xiaonan Yang, a [graduate student](#) at MU, watched how people's pupils changed in response to their physical reactions to a collision avoidance warning by a vehicle-assisted safety system. Researchers believe they have enough data to begin the next step of developing a two-way communication model.

Evaluating rear-end accidents from a driver's perspective

A person's pupil could also help scientists find a way to decrease distracted driving crashes through a first-hand perspective into a driver's behavior, according to Kim and Rui Tang, a graduate student at MU. Using a driving simulator at the MU College of Engineering, the researchers evaluated a driver's physical behavior in [real-time](#) by focusing on the driver's eyes as the [crash](#) happened.

"We saw the size of a person's pupil changed depending on the behavioral response to the severity of the accident," Kim said. "Now, we want to take that data, find common patterns and build a model to test how we could help decrease distracted-driving crashes."

The conference papers, "Evaluating rear-end vehicle accident using pupillary analysis in a driving similar environment," and "Pupillary response and EMG predict upcoming responses to [collision](#) avoidance warning," were presented at the 2019 International Conference on Applied Human Factors and Ergonomics in Washington, D.C.

Provided by University of Missouri

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