

Research Report Summary



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Training to Improve Drivers' Behavior When Partial Driving Automation Fails

There are several situations where Level 2 (L2) vehicles cannot work properly. Considering all the limitations of these systems, it is necessary for the driver to perceive the hazardous situation, regain control of the vehicle, and maneuver through the hazardous situation. The objective of the current study was to design a training program to increase drivers' situational awareness regarding operational design domain (ODD) and improve drivers' performance in transfer of control situations while driving with L2 automation features.

To achieve this, a PC-based training program was designed. This training method consists of three modules. The first module is 'mistake' where the trainee is put into an unfamiliar setting and is allowed to make errors. The second module is 'mentoring' where the trainee is guided to avoid such errors. The third module is 'mastery' where the

trainee is then given the opportunity to correct their mistakes.

To test the training program, a between subject experiment was conducted. Participants were recruited and assigned to three training condition groups (PC-based Training, user manual training, and placebo training). Participants in all groups were presented with a brief explanation of the L2 vehicles. The user manual group received a document with user manual information. The PC-based training group went through the PC-based training session. Participants in the placebo training group received a training regarding other automated features apart from ACC and Lane Centering System, which were the focus of PC-based training. All participants then drove through scenarios on the driving simulator.

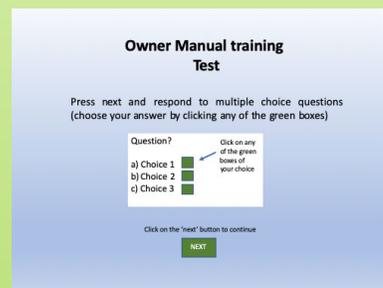
Driving Simulator



PC-based Training



User Manual Training



Placebo Training



Outcomes

The percentage of successful take back control attempts was highest in the PC-based training group compared to the User Manual and Placebo training groups. Results from the SART questionnaire showed that the participants in the PC-based training group were more situationally aware than the participants in the User Manual and Placebo training groups on average. The figures below represent the percentage of participants who successfully took back control and average overall SART scores for each group.

Impacts

This study sheds light on inherent problems regarding the information presented in the owners' manual, specifically those related to the system limitations, which is critical safety related information for new owners. Both researchers and manufacturers should look into new ways to effectively transfer knowledge to the drivers. Alternatively, they could build upon our PC-based training program to design a comprehensive and advanced training program to deliver at dealerships, driving schools, etc.

