(7) Title

Risk analysis of autonomous driving system using STAMP/STPA - confluence on highway -

Speaker, Authors

Aichi Institute of Technology. Masatoshi Hori, MITSUBISHI ELECTRIC ENGINEERING COMPANY LIMITED. Nobuyuki Ito,

Aichi Institute of Technology. Katsuhiko Kaji, Katsuhiro Naito, Tadanori Mizuno, Naoya chujo

Abstract

In recent years, autonomous driving systems have been actively researched and developed because of social demands for safety, economical and environmental problems. Particularly, with regard to expressways, some systems which realized some functions of SAE Level 3 have been launched.

In Level 3, the autonomous driving systems have to cooperate with the driver's operation. If the autonomous driving system and the driver cannot communicate properly, there are some risks which lead to traffic accidents. However, to the best of the author's knowledge, these risks and their mitigation have not been sufficiently analyzed.

Therefore, we focus on the cooperation between this autonomous driving system and the driver and try to analyze the risk using STAMP/STPA. In this research, we focus on the confluence of expressway and analyze their risks.

As a result of the analysis so far, we found that the risk of rapid approach from the rear was increased by applying a manual brake operation, if the driver is not accustomed to merging onto the expressway (Fig. 1). It could be avoided by providing information about other vehicles around the autonomous driving vehicle by using road-to-vehicle communication.

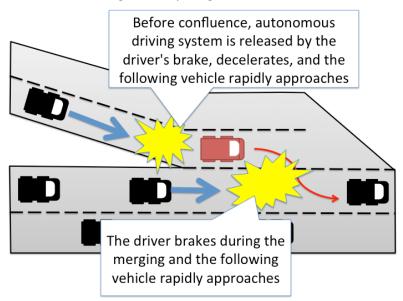


Figure 2: Risks at confluence on highway

Keywords

- (1) Autonomous Driving
- (2) Driving Assistant System
- (3) Driver Collaboration
- (4) Expressway
- (5) Confluence point