The 3rd STAMP Workshop in Japan

Title

Safety analysis of autonomous driving vehicles using STAMP / STPA ~ Misuse related to steering system~

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Abstract

Considering the safety design of an autonomous driving vehicle, there is a functional safety standard ISO 26262 concerning electric and electronic systems in the automotive field. Furthermore, it is necessary to deal with SOTIF which assumes safety risks with performance limitation and misuse other than system failure.

In the autonomous driving (level 3), autonomous vehicles can become unsafe state if the manual driving is operated, with disagreement in communication between the autonomous driving system and the driver. This disagreement may be occurred and cause misuse, in the situation when switching between autonomous and manual driving, we focused this situation. STAMP/STPA which enables efficient safety analysis for the complicated interaction between the steering system and the autonomous driving system including HMI is used.

In this paper, we have considered issues which should be resolved by using STAMP/STPA, at the situation above. Furthermore, we have introduced the experimental result concerning the issues related to steering system.

Keywords

(1) Autonomous driving

(2) SOTIF

(3) misuse

(4) STAMP/STPA

(5) Steering system